

PHYSICAL THERAPIST ASSISTANT STUDENTS

WITH LEARNING DISABILITIES:

Problem Areas in Content, Teaching

Techniques and Assessment

By

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ABSTRACT

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Physical Therapist Assistant Students with Learning Disabilities: Problem Areas in  
Content, Teaching Techniques and Assessment

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Publication Manual of the American Psychological Association, 5<sup>th</sup> edition, was used in the production of this study.

Increasing numbers of students with disabilities have entered post-secondary educational programs since the passage of the Americans with Disabilities Act. Individuals with learning disabilities (LD) make up the largest and fastest growing group among college students with disabilities. Students with LD have entered and succeeded as students and professionals in the fields of medicine and allied health. Schools and employers are now required by law to make reasonable accommodations to allow otherwise qualified individuals with disabilities to learn and work effectively and be protected from discrimination based on disability.

This is a study of students with learning disabilities in an associate degree program for physical therapist assistants to determine the number and percent of individuals with learning disabilities within the program, the areas of difficulty for these students in the program, and accommodations which they believed helped them or would help other students with learning disabilities. A survey instrument was administered to six graduates or students with documented learning disabilities who completed at least one year of the program. 10.6 percent of the students who had completed at least one year received services for learning disabilities and revealed their disability to the investigator. A list of the most difficult content areas was developed from the difficulty ratings of the respondents. The greatest difficulty with learning was reported with competencies requiring memorization, competencies requiring precision and attention to multiple details, and general education competencies not mastered before entering the program. Mastery of performance competencies taught in laboratories was rated less difficult than academic competencies taught in lecture format. In the area of assessment, tests with time pressure and open-ended test questions presented the most problems for these students. Respondents' ratings indicated that learning was made difficult by the program's schedule which places an entire week's instructor contact for a course on one day. A wide variety of accommodations and study suggestions are proposed and discussed.

## TABLE OF CONTENTS

Abstract.....	ii
Chapter I: Introduction	
Background.....	1
Statement of the Problem.....	2
Purpose of the Study.....	2
Research Questions.....	3
Significance of the Study.....	3
Limitations of the Study.....	4
Definitions of Terms.....	4
Chapter II: Review of Literature	
Theoretical Definition of Learning Disability.....	8
Operational Definition of Learning Disability.....	10
Incidence of Learning Disability.....	12
Characteristics of Individuals with LD.....	13
Areas of Academic Difficulty for Students with LD.....	15
Reasonable Accommodations.....	16
Learning Disability and Allied Health Education Programs.....	17
Gateway Technical College PTA Program.....	18
Learning Disability and Accommodations in PTA Education Programs...	19
Chapter III: Methods and Procedures	
Introduction: Research Design.....	21
Population and Sample.....	21
Instrumentation.....	21
Field Testing.....	22
Research Procedure.....	23
Data Collection and Processing.....	24
Methodological Assumptions.....	25
Limitations of Methodology and Procedures.....	25
Chapter IV: Findings and Discussion	
Question One: Incidence of LD.....	26
Question Two: Areas of Difficulty	
Academic Content.....	28
Laboratory Content.....	28
Level of Difficulty by Course and Semester.....	31
Lab vs. Lecture.....	35
Assessment Techniques.....	35
Instructional Methods.....	38
Question Three: Accommodations.....	38
Discussion	
Incidence of LD.....	42
Areas of Difficulty.....	42
Potential Accommodations.....	43

Chapter V: Summary, Conclusion, and Recommendations		
Summary		
Restatement of the Problem.....		44
Methods and Procedures.....		44
Major findings of the study.....		45
Conclusions.....		47
Recommendations		
Recommendations Related to this Study.....		48
Recommendations for Further Study.....		48
References.....		50
Appendices		
Appendix A: Research instrument.....		58
Appendix B: Interview Script.....		64
Appendix C: Research instrument, first draft.....		66
Appendix D: Letter to potential subjects.....		72
Appendix E: Consent form.....		73

#### TABLES AND FIGURES

Table 1	Incidence of LD; graduation rates	27
Table 2	Most difficult areas of academic content	29
Table 3	Most difficult areas of laboratory content	30
Table 4	Level of difficulty, by course	32
Table 5	Number of items rated as one of the three most difficult, by course and by semester	34
Table 6	Mean rating, academic vs. lab	36
Table 7	Respondent suggestions for new program accommodations and study aids for future students	40
Figure 1	Percent of responses: lab vs. lecture	37

## CHAPTER I

### Introduction

#### *Background*

Increasing numbers of students with disabilities have entered college in the years since the passage of the Americans with Disabilities Act (ADA) of 1990 (Henderson, 1999). The ADA forbids discrimination against individuals with disabilities in a variety of public and private institutions, and it reinforces and expands earlier laws, including Section 504 of the Rehabilitation Act of 1973 (Morrissey, 1993). Together, these laws prohibit discrimination in education and employment against an “otherwise qualified individual” solely on the basis of disability (Hendrickson, Lyden, Tarter, Banaitis, & Cicirello, 1998; Morrissey, 1993). Educational institutions are required to make reasonable accommodations in teaching and testing methods for students who self-disclose their disabilities (Walters & Croen, 1993).

In the American Council on Education’s triennial report, *College Freshmen with Disabilities*, Henderson (1999) found that 3.5 percent of first-year, full-time freshman entering college in 1998 identified themselves as individuals with learning disabilities (LD). Henderson also reported that the number and proportion of students with learning disabilities had grown faster than any other disability; 41 percent of students with disabilities reported having a learning disability. Young (1996) indicated that the actual incidence may be higher because, in spite of the ADA, some students remain reluctant to report a learning disability for fear of negative consequences.

Colon (1997), Faigel (1998), Kornblau (1995), and Gordon and Keiser (1998) all reported increasing numbers of applicants, enrollments, and graduations of students with

LD in a various health education programs. Rangel, Wittry, Boucher, and Sanders (2001) reported that 73 percent of physical therapy programs responding to their survey had made accommodations for students with learning disabilities. Specific accommodations requested by allied health and medical students with learning disabilities have been discussed by many researchers (Rangel, Wittry, Boucher, & Sanders, 2001; Faigel, 1998; Colon, 1997; Kornblau, 1995). A review of published literature found no studies which examined an allied health curriculum to determine which particular areas of content, performance, and/or assessment are most difficult for students with LD.

#### *Statement of the Problem*

Limited research exists on students with learning disabilities in the medical and allied health education programs, particularly in the field of physical therapy. A review of published literature found no published articles examining the incidence of students with learning disability among students in health programs. Additionally, the basic competencies and assessment methods in physical therapist assistant (PTA) education have not been systematically analyzed to determine which areas present the most difficulty to students with LD. Only one published article has addressed general and specific accommodations in physical therapist (PT) education programs but not in PTA programs (Rangel et al., 2001).

#### *Purpose of the Study*

The purpose of this investigation is to determine which curriculum content areas, instructional methods and assessment activities of the Gateway Technical College physical therapist assistant (hereafter referred to as PTA) curriculum have presented the most difficulty to students with learning disabilities. The investigator is the director and

lead instructor of the program. Additionally, the subjects will provide data regarding accommodations used while in the program and suggested accommodations for future students. The end product will be a listing of the areas of greatest difficulty for students with LD and a list of potential accommodations for future PTA students with LD.

### *Research Questions*

1. During the first six years of the Gateway PTA program, how many students received services for learning disabilities and revealed their disabilities to their instructors?
2. According to the current and former students, what areas of curriculum content, and which instructional and assessment methods, are the most difficult for students with learning disabilities?
3. What accommodations have been made or could be made for students with LD in the areas of difficulty found in this study?

### *Significance of the Study*

Increasing numbers of students with learning disabilities are entering post-secondary education programs. Medical and allied health programs have a need and obligation to identify and make accommodations for these students, while at the same time maintaining high professional standards for their graduates. Colon (1997) reported that nursing students with LD have experienced academic success as measured by retention and graduation rates. These findings support the appropriateness of recruiting and enrolling students with LD in allied health education programs and confirms that they can succeed with appropriate accommodations. Increased awareness of the most difficult components could lead instructors to develop and improve instructional and assessment accommodations in these areas.



### *Limitations of the Study*

This investigation includes a limited number of subjects from a single PTA program. The results may have limited applicability to other PTA programs or to allied health education in general. Subjects are students and former students officially recognized by the college as individuals with learning disabilities and who revealed their disability to the investigator while attending his classes. The college's criteria for LD may be more or less inclusive than at other schools. The population does not include students with undiagnosed LD, students who did not seek services for their disability, or students who chose not to reveal their disability to the investigator. Finally, there is no comparable data for students without LD, so conclusions regarding differences in perceived difficulty between students with and without LD cannot be drawn.

### *Definition of Terms*

#### *Disability*

The term "disability" means, with respect to an individual—(A) a physical or mental impairment that substantially limits one or more of the major life activities of such individual; (B) a record of such an impairment; or (C) being regarded as having such an impairment. (Americans with Disabilities Act (ADA), 1990, sec. 3 (2)).

#### *Essential Functions*

Functions that are fundamental to a position rather than marginal or incidental. As a general rule, highly specialized functions of any position will qualify as essential functions...Functions that only a limited number of employees can

provide are often found to be essential. (American Medical Association, 1998, p.20).

#### *Physical Therapist (PT)*

The physical therapist provides services aimed at preventing the onset and/or slowing the progression of conditions resulting from injury, disease, and other causes (APTA, 2002).

The physical therapist is considered the professional practitioner of physical therapy.

Current entry level degree into the profession is a master's degree (CAPTE, 2000).

#### *Physical Therapist Assistant (PTA)*

The physical therapist assistant is a technically educated health care provider who assists the physical therapist in the provision of services. Responsibilities include treatment, assessment, communication, and documentation. PTA's are graduates of accredited two-year educational programs and are considered paraprofessionals (CAPTE, 2000).

#### *Qualified Individual with a Disability*

An individual with a disability who, with or without reasonable accommodation, can perform the essential functions of the employment position that such individual holds or desires. For the purposes of this title, consideration shall be given to the employer's judgment as to what functions of a job are essential, and if an employer has prepared a written description before advertising or interviewing applicants for the job, this description shall be considered evidence of essential functions of the job. (ADA, 1990, sec. 101 (8)).

#### *Reasonable Accommodation*

(A) Making existing facilities used by employees readily accessible to and usable by individuals with disabilities; and (B) job restructuring, part-time or modified

work schedule, reassignment to a vacant position, acquisition or modification of equipment or devices, appropriate adjustment or modifications of examinations, training materials, or policies, the provision of qualified readers or interpreters, and other accommodations for individuals with disabilities.” (ADA, 1990, sec. 101 (9)).

*Student With a Learning Disability, Operational Definition*

A student who is officially recognized by their educational institution as an individual with a learning disability, according to the institution’s policies and procedures.

*Student With a Learning Disability, Theoretical Definition (Conceptual Definition).*

A student who displays or demonstrates difficulties in learning or academic performance meeting the following criteria:

- a) the learning disability is intrinsic to the individual student, rather than due to factors in the student’s environment;
- b) the student displays significant differences in the level or quality of achievement in different academic areas;
- c) the learning disability may be manifested at any point in the life span;
- d) the student’s difficulties with learning are not the result of other impairments, but can exist concomitantly with other impairments. (Kavale & Forness, 2000; Gordon, Lewandowski, & Keiser, 1999; Shaw, Cullen, McGuire, & Brinckerhoff, 1995).

*Student with a Suspected Learning Disability*

A student not officially recognized by his/her educational institution as an individual with a learning disability but who, in the opinion of instructors, displays behaviors and

performance consistent with the above theoretical definition of a student with a learning disability.

## CHAPTER II

### Review Of Literature

#### *Theoretical Definition Of Learning Disability*

The term learning disability was first used in the 1960's to describe children who demonstrated learning patterns similar to persons with brain injury, but who displayed minimal or no signs of neurological disturbance (Mangrum & Strichart, 1984; Ross-Gordon, 1989). From the outset a precise definition of LD has been the subject of debate and controversy (Cousin & Diaz, 1995; Gordon et al., 1999; Kavale & Forness, 1995, 2000). The problem of definition can be seen in the following two examples. The first is from the U.S. Office of Education establishing rules to determine which children qualify for exceptional education services due to learning disability.

The term "specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in imperfect ability to listen, think, speak, read, write, spell or do mathematical calculations. The term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (U.S. Office of Education, 1977).

The second definition is from the Learning Disabilities Association of America, an advocacy group of professionals, parents, and clients with LD.

Specific Learning Disabilities is a chronic condition of presumed neurological origin which selectively interferes with the development, integration, and/or demonstration of verbal and nonverbal abilities.

Specific Learning Disabilities exists as a distinct handicapping condition in the presence of average to superior intelligence, adequate sensory motor systems, and adequate learning opportunities. The condition varies in its manifestations and in degree of severity. Throughout life, the condition can affect self-esteem, education, vocation, socialization, and/or daily living activities (Learning Disabilities Association of America 1986).

Kavale and Forness (2000) discuss four models which have been used in attempting to develop theoretical definitions of learning disability: disorder, deficiency, difference and discrepancy. In the disorder model LD is the result of central nervous system dysfunction intrinsic to the student; a medical/biological explanation of LD is suggested. In the deficiency model the student with LD has learning problems due to problems with a critical neurological function, such as a perceptual deficit. The student may be able to read and perceive individual letters and numbers but has problems with entire words and sentences. The difference model proposes that individuals learn and process differently, and that problems occur when there is a mismatch between the student learning and processing style and her/his learning environment. This model emphasizes psychosocial, cultural and other factors extrinsic to the student but essential to his/her learning. A fourth example is the discrepancy model, in which a gap is found between expected versus actual academic performance and no other explanation can be found for the discrepancy (Fawcett, Nicolson, & Maclagan, 2001).

Conceptual definitions of LD seek to rule out other disorders which themselves have a negative impact on learning but do not constitute LD (Kavale & Forness, 1998, 2000; Shaw et al., 1995). Researchers have found comorbidity between LD and attention deficit disorder (Maynard, Tyler, & Mit, 1999; Pastor & Reuben, 2002), attention deficit/hyperactivity disorder (Mayes, Calhoun, & Crowell, 2000), social skill deficits (Kavale & Forness, 1996), low self-esteem (Cosden & McNamara, 1997), schizophrenia (Sanderson, Best, Doody, Owens, & Johnstone, 1999), linguistic differences (Ortiz, 1997), and spina bifida (Dise & Lohr, 1998).

#### *Operational Definition of Learning Disability*

Each post-secondary educational institution and program adopts an operational definition of LD, which serves as a set of rules or criteria which students must meet to qualify for services (Kavale & Forness, 2000). Students who meet the institution's criteria will qualify for services and accommodations. While conceptual definitions give a general description of LD, operational definitions specify required tests and evaluations, and specific criteria applied to each of these in order to classify a student as an individual with a learning disability (Ofiesh & McAfee, 2000). Many researchers have found a lack of correlation between theoretical and operational definitions (Smith, 1998; Gregg & Scott, 2000; Kavale & Forness, 2000).

Ofiesh and McAfee (2000) surveyed college disability specialists to determine what types of information were used to determine eligibility and types of services for students with LD. Written psychoeducational reports are used to make these determinations. The respondents to their survey reported using the following components of the psychoeducational report: the diagnostician's recommendations (99 percent),

summary of cognitive strengths and weaknesses (96 percent), summary of academic strengths and weaknesses (96 percent), description of test behavior (86 percent), and actual test scores (80 percent). The tests used most commonly as part of the psychoeducational evaluation were tests of ability/intelligence (45 of 47), math (45 of 45), writing (45 of 45), and reading (45 of 45). Less frequently used were tests of learning strategies, social-emotional skills, study skills, foreign language learning ability, adaptive behavior, and self-advocacy.

Shaw et al. (1995), Smith (1998), Gregg and Scott (2000), and Ofiesh and McAfee (2000) all reported wide variations in the operational definitions used by educational institutions. Some public school districts and universities use stricter guidelines to restrict the LD classification in an effort to reduce expenditures, to ensure that limited resources go to students most in need, or both (Gordon et al., 1999). Other educational institutions use very inclusive operational definitions for LD, in part from a fear of lawsuits for not providing accommodations to students and families who request services (Smith, 1998). Differences in operational definitions have resulted in nine percent of all K-12 public school children in Massachusetts are enrolled in LD programs, as compared to only 2.9 percent of K-12 children in Georgia (Smith, 1998).

Variations in operational definitions create problems for LD researchers. Investigations comparing LD and non-LD students base their inclusion in research groups on their enrollment in an LD program (Kavale & Forness, 1998). The same research design comparing LD and non-LD students may come up with completely different results if the populations are drawn from institutions or states which have widely different operational definitions. Simmerman and Swanson (2001) found this to be one



of many factors, which limit the external validity of research comparing students with and without LD.

### *Incidence of Learning Disability*

Learning disability has been reported by multiple authors to be the fastest growing educational disability classification among post-secondary students, both in terms of numbers and proportion (Henderson, 1995, 1999; Smith, 1998). Henderson (1995) found that three percent of full-time freshmen entering college for the first time in 1994 self-reported a learning disability, increasing from 1.1 percent in 1985 and 2.2 percent in 1991. Among the entering class of 1998, the figure had risen to 3.5 percent (Henderson, 1999). The proportion of all students with disabilities reporting a learning disability rose from 15.3 percent in 1988 to 41 percent in 1998 (Henderson, 1999).

Vogel, Faith, Scales, Hayeslip, Hermansen, and Donnellis (1998) conducted a nationwide survey of post-secondary institutions, and reported that 0.7 percent of the students at reporting institutions had disclosed or been diagnosed with a learning disability. They found a significant difference in proportion of students with LD in community colleges and private institutions (3.01 percent) versus public universities (0.65 percent).

Pastor and Reuben (2002) obtained data on learning disability and attention deficit disorder (ADD) among children from six to 11 years of age, as part of a nationally representative household survey conducted in 1997 and 1998. They reported that four percent of children nationwide had been diagnosed with learning disability alone, and another four percent had been diagnosed with both LD and ADD. Other findings included similar percentages of boys and girls with LD alone, twice as many boys as girls

with both LD and ADD, and no significant variation in rates of diagnosis of LD alone by race or ethnicity.

One reason for the differences in reported incidence is student reluctance to reveal their disability status to the institution (Young, 1996). An employer or educational institution is not allowed to ask if an applicant has a disability during an interview or on an application. On the other hand, schools are not required to provide accommodations unless an individual informs them that s/he has a disability, provides proof or documentation of the disability, and requests accommodations (Ward, Ingram, & Mirone, 1998; McGuire & Madaus, 1996). Although the ADA provides legal protection against discrimination, some applicants are reluctant to voluntarily reveal a disability for fear of being refused admission or suffering other reprisals because of negative public attitudes toward their disability. Even after enrollment, some students remain reluctant to reveal their disability to instructors (Young, 1996).

#### *Characteristics of Individuals with Learning Disabilities*

Mangrum and Strichart (1994) summarized common characteristics of college students with learning disabilities: cognitive and language difficulties, problems with perceptual and motor skills, poor work and study habits, limited social skills, and impaired emotional development. Deficits in short-term and working memory have been found in students with LD and dyslexia (Ackerman and Dykman, 1993; Swanson, 1994). Cornoldi, Rigoni, Tressoldi, and Vio (1999) reported that students with LD scored significantly lower than a control group of students without disabilities on a battery of tests involving visual memory and forming visual images from oral instructions. They concluded that students with LD had particular difficulty with tasks requiring visual

imagery and visual-spatial working memory. Fawcett, et al (2001) reported that elementary school students with dyslexia had lower scores on tests of cerebellar function than did slow readers without dyslexia. Dyscalcula (math disability) and dyslexia have been found to have a hereditary component (DeFries, Fulker, & LaBuda, 1987; Alarcon & DeFries, 1997).

The *Journal of Learning Disabilities* has published a number of articles comparing college students with and without learning disabilities. Ferri and Gregg (1997) looked at a group of 94 students with LD, 48 of whom demonstrated giftedness, and 46 of whom did not. They found that the students with LD and giftedness were less likely to be diagnosed early in life, in part because their common profile included high verbal comprehension and abstract thinking abilities, which tend to mask the underlying disability in other areas. Many of these students were not diagnosed until they reached college. At the same time, they were not recognized as gifted either, because their scores on standardized tests were lower than gifted, non-disabled peers.

The variable presentation of learning disability suggests that there may be multiple causes of LD and multiple areas and types of impairment (Kavale & Forness, 1995). Unlike individuals with traumatic brain injury or stroke, central nervous system structures of individuals with LD do not appear visibly different from normal structures, even with modern imaging technology (Ross-Gordon, 1989). Some individuals with LD are highly intelligent but do not perform well in school because of their impairments (Ferri & Gregg, 1997). Others who have used academic accommodations and self-awareness of their own strengths and weaknesses have performed as well as or better than their non-disabled peers (Gordon, Lewandowski, & Keiser, 1999). Many students are not

diagnosed with LD until they reach college-age because they are able to self-accommodate while facing the lesser challenges of elementary and high school (Gordon et al., 1999). Walters and Croen (1993) noted anecdotal reports that at least half of the undergraduate students with LD were undiagnosed prior to entering college.

*Areas of Academic Difficulty for Students with Learning Disabilities*

Many specific areas of academic difficulty for students with LD have been reported in the literature. Ross-Gordon (1989) listed the following areas of difficulty for adult students with LD: low academic performance compared to expected performance; deficits in math, reading and writing; and language and information processing and output. Poor performance in math and language has been extensively studied (Shafir & Siegel, 1994; Davis & Parr, 1997). Other specific problems include performance on timed tests (Alster, 1997), conceptual reasoning (Dise & Lohr, 1998), and spatial learning (Rochford, 1985).

Hughes and Suritsky (1994) studied note-taking skills and performance of college students with and without LD, and found that the students with LD performed significantly lower on all measures. Baker (1985) had found that students who took more notes tended to have higher average test scores. For the students with LD, they concluded that limitations in auditory processing (quickly understanding what is said) and psychomotor performance (writing down what is understood) combine to reduce the amount and quality of notes, leaving the student with a less effective learning aid after the lecture or lab has ended.

### *Reasonable Accommodations*

The ADA requires employers to develop lists of essential functions which an employee must be able to perform for each job title. This is required to assure that an otherwise qualified individual would not be denied employment due to a disability, if that individual, “with or without reasonable accommodation, can perform the essential functions of the employment” (Americans with Disabilities Act, 1990, Sec 101(8)). Educational programs are also required to make reasonable accommodations for students with known disabilities, based on the individual student’s particular needs (Ingram, 1994; Rangel et al., 2001).

Reasonable accommodations may be any modification in instructional methods, classroom conditions, or testing rules or methods. The student still must meet the same minimum performance standards as other students in the program, and must be able to perform the essential functions with the agreed-upon accommodations. Scott (1994) listed the following as criteria for considering whether an accommodation was reasonable: based on documented, individual need; allows the student the most integrated learning experience possible; does not compromise essential requirements of the course or program; does not pose a risk to personal or public safety; does not impose a financial or administrative burden on the institution; is not considered a service of a strictly personal nature.

Colon (1997) reported that four accommodations were provided by more than 50 percent of nursing programs with students with LD: counselors, tutors, tape-recorded lectures, and computer access. Colon also found that 14 percent of responding nursing programs allowed students with LD to take longer to complete their professional

programs. Ganschow, Coyne, Parks, and Antonoff (1999) conducted a nationwide survey of graduate and professional schools which included accommodations provided. Of the 173 programs, 95.7 percent allowed extended test time, 46.9 percent allowed oral tests instead of written, and 59.7 percent allowed extended time to complete the program.

Alster (1997) studied extra time on tests, a commonly used accommodation for students with LD. Students with and without LD took an algebra test under timed conditions, and then took a comparable test with extended time. Test scores for the students with LD were significantly lower than those of the students without LD under timed conditions. In the extended-time condition, scores for the students with LD increased significantly, to the point where the mean raw score for the extended-time test for students with LD did not differ significantly from the timed or untimed scores of the non-LD group.

#### *Learning Disability and Allied Health Education Programs*

With the passage of the Americans with Disabilities Act (ADA) of 1990, more students with learning disabilities have been graduating from high school and entering post-secondary education (Colon, 1997; Henderson, 1995, 1999; Hendrickson et al., 1998). Among freshmen with LD entering college for the first time, nursing was the third most popular career choice (Henderson, 1995). Colon (1997) found that students with LD had been admitted to almost 50 percent of nursing programs in North Carolina, and had graduated from one-third of the programs. Faigel (1998), Kornblau (1995), and Gordon & Keiser (1998) all reported increasing numbers of applications, enrollments, and graduations by students with LD from a variety of health education programs.

Walters and Croen (1993) stated that one to two percent of the students of each class of medical students were referred for a comprehensive evaluation of learning disabilities, but did not state how many of those were found to be students with LD. Many of the students identified with LD in allied health programs had not been previously diagnosed, because of academic success and effective coping strategies in previous educational experiences (Walters & Croen, 1993; Colon, 1997).

*Gateway Technical College Physical Therapist Assistant Program*

Physical therapist assistants (PTA's) provide services and treatment to patients under the supervision of a licensed physical therapist (PT). PTA's must earn an associate degree (two-year) from an accredited education program. Programs for both PT's and PTA's are accredited by the Commission on Accreditation for Physical Therapy Education (CAPTE). Each PTA educational program develops its own sequence of courses, based on recommendations of a local advisory committee and consistent with CAPTE's accreditation guidelines. Students complete a series of supervised practice experiences with patients in hospitals, clinics, schools, and nursing homes (Commission on Accreditation in Physical Therapy Education, 2000).

Gateway's PTA program first accepted students in the fall of 1996. In 1998 the program graduated its first class and received initial five-year accreditation from CAPTE (CAPTE, 1998). From 1996 through 2002, a total of 77 students entered the program. Courses are taught by two full-time instructors who use team-teaching for about half of the curriculum (Gateway Technical College, 1998). All PTA program courses in the first three semesters include combinations of lecture and laboratory; most are scheduled so

that all course content for a week is presented on one day. Fourth semester courses are primarily lecture.

A maximum of 16 students is admitted each fall. At a mandatory orientation to the program prior to the start of classes, students accepted into the program are informed orally and in writing of the availability of services to students with disabilities and how to initiate a request for services (Palacios, 2001). The college also requires that all course syllabi include a paragraph offering special needs services (Gateway Technical College, 2001).

The Special Needs office serves students with disabilities at Gateway with two full-time staff members on the Kenosha campus. The Special Needs counselors accept self-referral or referral by instructors, but “accommodations are not provided unless the learner self-identifies and requests them.” (Gateway Technical College, 2000). To qualify for services and accommodations, the student must provide documentation of a disability from an appropriate professional who has assessed, diagnosed, or treated the individual student for this disability (Gateway Technical College, 2000).

The Special Needs office assists students in arranging for diagnostic testing as needed (as in the case of a previously undiagnosed learning disability). The office has an unwritten policy of providing services to students for one semester as a courtesy until the student can complete testing required to document a need for accommodation. (Millette, 2001).

*Learning Disability and Accommodations in PTA Education Programs*

Rangel et al. (2001) published the first attempt to discuss accommodations for physical therapy students with various disabilities, including learning disabilities. 73



percent of the PT programs responding to their study reported having students with LD, the most common disability encountered. They did not collect information on incidence of LD, and they studied only PT education programs, not PTA. The following accommodations were requested and frequently provided: extended test times; tape recorders; make-up examinations; transcripts of lectures; one-to-one teaching; videotaped lecture; special assignments; and books on tape. The authors did not specify the disabilities for which these accommodations were made.

While it is a field dedicated to dealing with disability, students with disabilities have reported difficulty obtaining services and support in physical therapy education programs. Almost half of PT and PTA students with disabilities reported that they were seldom provided with the accommodations which they felt necessary (Ward et al., 1998). However, this study included no students with learning disability, despite the authors' comment that students with LD are commonly found among PT and PTA students.

Several published articles in the field of physical therapy education have dealt with essential functions and accommodations (Ingram, 1994; Hendrickson, S., Lyden, S., Tarter, C., Banaitis, D., & Cicirello, N., 1998). Ingram (1994) is the only author to have research this topic in PTA programs. A literature search reveals no published articles on the incidence of learning disability in either PT or PTA educational programs, or addressing the areas of academic difficulty for students with LD.

## CHAPTER III

### Methods and Procedures

#### *Introduction: Research Design*

This is a descriptive study using a survey instrument administered via one-on-one interview with students with learning disabilities regarding areas of difficulty for them in the Gateway Technical College PTA program. The investigator is the program director and lead instructor of the program. The methods used to conduct this study are explained in this chapter under the following headings: population and sample, instrumentation, pilot testing, research procedure, data collection and processing, methodological assumptions, and limitations of methodology and procedures.

#### *Population and Sample*

The population for this investigation was all Gateway Technical College PTA students between the years 1996 and 2002 who completed at least one year of the program, received services for LD through the campus Special Needs office, and revealed their learning disability to the investigator. Seven individuals met the criteria for inclusion. All of the potential subjects still lived within or near the Gateway district at the time of the research. Due to the small number of potential subjects and their continued proximity to the college, a 100 percent sample was attempted. 65 percent participation was considered an acceptable minimum.

#### *Instrumentation*

Data was collected using a written survey instrument developed by the investigator; a copy can be found in the Appendix A. The instrument included questions in five sections: academic content (textbook, lecture, and discussion), performance

content (laboratory demonstration and practice), teaching methods, assessment techniques and accommodations. Items in the academic and performance sections were grouped by the courses in which they were taught and in the order in which they occurred during the program sequence. The subjects rated the level of difficulty of an item using a one-to-five, Likert-like ordinal scale, as follows: 1 = very easy; 2 = easy; 3 = minimally difficult; 4 = moderately difficult; 5 = extremely difficult; N/A = no answer/don't remember. After completing all items in the academic and performance sections, subjects were asked to select the three most difficult items from each area. In the final section subjects provided information on accommodations which they used while in the program or which might benefit future students.

The instrument included instructions at the beginning of each section. There were no items on the instrument which could be used to identify the individual who completed the interview. Along with the instrument an interview script was prepared, a copy of which can be found in Appendix B.

### *Field Testing*

An early draft of the instrument was reviewed for completeness by Margaret Thomas, academic coordinator of clinical education and full-time instructor in the PTA program, who made several additions and corrections to the form. The instrument and interview script were then field tested in an interview with a program graduate without a learning disability. Further modifications were made in the instrument and in the interview script as a result of the field test. The original draft of the instrument, prior to these revisions, can be found in Appendix C.

### *Research Procedure*

A list of potential subjects was created by the investigator from course rosters. Potential subjects were sent a letter informing them of the purposes and activities involved in the investigation, along with a consent form and a return envelope; copies of the letter and consent form can be found in the Appendices D and E respectively. Potential subjects were instructed in the letter to read, sign and return the consent form indicating their agreement or refusal to participate. A second letter was sent three weeks later to those who did not respond to the first letter.

Two steps were taken to protect the subjects' from coercion while trying to maximize participation. Current students may have been unwilling to participate, reluctant to refuse participation, or uncomfortable in answering freely in an investigation by an instructor on whom their academic career depended. Some program graduates may have had similar reservations because of ongoing professional relations with the instructor or the program. Therefore, a letter of invitation was chosen over a telephone call to allow potential subjects more freedom to decline participation. Secondly, in order to make sure that subjects felt free to answer questions openly and honestly, the letter offered potential subjects the option of being interviewed by a staff member of the Special Needs office rather than the investigator. The Special Needs staff member was a person with whom all subjects already had a history of confidential dealings.

The research procedure was approved by the University of Wisconsin-Stout Institutional Review Board for the Protection of Human Subjects in Research on April 19, 2002. Letters were sent to seven potential subjects following the approval, and six

agreed to participate. All six chose to be interviewed by the investigator. One potential subject declined to participate.

The survey was administered during May and June of 2002, in a one-on-one interview following the prepared script. The interviewer read the instructions and each item to the respondent. The investigator and the respondent each filled out their own copy of the instrument. At the end of the interview the two completed forms were compared and discrepancies were resolved. The instrument completed by the investigator was the one used for data analysis.

#### *Data Collection and Processing*

The instruments completed by the investigator, after being cross-checked with the subject's form, were used for data analysis. Analysis of subject responses to the first four sections (which used the one-to-five scale) was done using Microsoft Excel. A mean score for difficulty of each item and for all items in each program course was calculated. For each subject, a mean score for each section was calculated, along with a ratio of means for the academic and lab sections. The frequencies and percentages for each response were tabulated for the academic and laboratory sections. Items selected as one of the three most difficult in the academic and performance sections were tabulated, and were grouped by the course in which each is taught. Frequency counts were performed for accommodations listed on the instrument, and a list was created of additional suggested accommodations.

Following preliminary analysis by the investigator, a sample of the instrument and the Excel spreadsheet were sent to Christine Ness, statistical consultant at the UW-Stout Office of Computer Education and User Services, to provide analysis of the results and

procedures and suggest further analysis. When data analysis was completed and returned, the investigator shredded the instruments completed by the subjects and retained the survey instruments which he completed.

#### *Methodological Assumptions*

The interview format was chosen because students with LD frequently have difficulties with attention, visual processing, reading, transpositions, and filling out test forms (Smith, 1998). The investigator believed that these difficulties and potential sources of error would be minimized by administering the written instrument as part of an oral interview, and by cross-checking the two forms at the end of the interview. The interview format was also chosen to guarantee that subjects would consider each item individually and attentively, rather than speeding through it and giving less thoughtful and accurate responses.

#### *Limitations of Methodology and Procedures*

The population for this investigation may not have included all of the students with LD who completed one year or more of the Gateway PTA program. Excluded were students who did not reveal their disability to the instructor. Students with LD who did not seek accommodations through Special Needs were also not included. There were several students in the PTA program with suspected learning disabilities who were not included because they neither revealed their disability to the investigator nor sought services or accommodations from the Special Needs office.

Characteristics of the population and sample are not reported in order to protect the identities of the subjects.

## CHAPTER IV

### Findings and Discussion

#### *Question One*

*During the First Six Years of the Gateway PTA Program, How Many Students Received Services for Learning Disabilities and Revealed their Disability to their Instructors?*

From 1996 through 2002, a total of 77 students entered the Gateway PTA program. At the time at which the research was conducted, 66 had completed at least one year of the program. Of those 66 students, seven (10.6 percent) received services for learning disabilities through the Special Needs program and informed the investigator of their disability. All seven of the potential subjects graduated from the program; two of them (28.6 percent) required more than two years to graduate. Data on incidence and graduation rates is presented in Table 1 on the next page.

Table 1

Incidence of Learning Disability in Gateway PTA Program; Graduation Rates

students	Completed at least one year	Still in the program	Graduated	Graduated in two years
All PTA program students	66	9	57	54
Students with LD, self-disclosed	7	0	7	5
All other program students	59	9	50	49

Seven out of 66 students who completed at least one year of the PTA program received services for learning disability and self-disclosed their disabilities to the investigator. All seven (100 percent) have graduated from the program, five of them (71.4 percent) within the minimum of two years. 49 out of 50 (98 percent) of the graduates who did not disclose a learning disability completed the program within two years.



## *Question Two*

*What Areas of Curriculum Content, and Which Instructional and Assessment Methods, Are the Most Difficult for Students with Learning Disabilities?*

*Academic content.* Table 2 contains the academic items rated most difficult using two different criteria: items chosen by at least one respondent as one of the three most difficult areas of academic content, and items rated as “4” or “5” (moderately or extremely difficult) by at least four respondents. 17 of the 49 academic items (34.7 percent) met either or both of the criteria and are listed in the table. Six of the 17 items were related to anatomy. Other areas of difficulty involved pathology and technical writing skills. Three items had a mean rating of difficulty of 4.0 or greater: neuroanatomy, neurological pathology, and documentation. The mean rating of difficulty for all academic items was 3.12.

*Laboratory/performance content.* Table 3 contains the laboratory/performance items rated most difficult on two different criteria: items chosen by respondents as one of the three most difficult areas of laboratory content, and items rated as “4” or “5” (moderately or extremely difficult) by at least four respondents. 13 of the 37 laboratory items (35.1 percent) met either or both of the criteria are listed in the table. Five of the items were listed as difficult because only one respondent rated the item as one of the three most difficult. Of the other eight performance items rated as difficult, almost all involved patient assessment, measurement, and progression. No items in the laboratory section had a mean score of 4.0 or more. The mean rating of difficulty for laboratory items was 2.85.

Table 2

Most difficult areas of academic content (n = 6)

Academic area	No. of responses of "4" or "5"	no. of selections as one of the three most difficult areas	mean score
Neuroanatomy	5	1	4.17
Neurological pathology	5	1	4.17
Documentation	5	1	4.00
Joint anatomy	5	2	3.83
Orthopedic pathology	5	0	3.83
Musculoskeletal anatomy	3	2	3.83
Physics: levers, force, torque	4	1	3.67
Prime & assisting movers	4	1	3.67
Osteo/arthrokinematics	4	2	3.67
Anatomy of spinal cord injury	4	1	3.67
Goal writing	4	0	3.67
Neurotreatment theories (n=5)	3	1	3.60
Exercise types	4	1	3.50
Physiology/anatomy of motor function	3	1	3.50
Muscle origins and insertions	3	1	3.50
Normal gait	2	1	3.17
Energy consumption/conservation (n=5)	1	1	2.60

Among the 17 academic content items listed, nine met both criteria for inclusion in the table.

Table 3

Most difficult areas of performance/laboratory content (n = 6)

Lab/performance area	No. of responses of "4" or "5"	no. of selections as one of the three most difficult areas	mean score
Rehab & progression: brain and spinal cord injury	4	4	3.83
Orthopedic assessment	5	1	3.83
Neuro-exercise applications	4	2	3.67
Cardiac rehab & progression	5	1	3.67
Muscle testing (strength)	4	1	3.67
Pulmonary rehabilitation	4	2	3.50
Goniometry (measure joint motion)	4	0	3.50
Exercise applications: PNF, plyometrics	2	2	2.83
Gait analysis	3	1	3.50
Palpation for landmarks and pain	1	1	3.00
Mechanical traction	2	1	3.00
Ultrasound treatment	2	1	2.83
Heat and cold modalities	1	1	2.16

Among the 13 laboratory/performance items listed, the first six met both criteria for inclusion in the table.

*Level of difficulty by course and semester.* Respondents' ratings of difficulty were grouped by course, with results listed in Tables 4. Three courses had a mean rating of difficulty above 3.0: Neurocardiopulmonary (3.51), Orthopedics (3.33) and Kinesiology (3.25). All other courses had a mean rating of difficulty of less than 3.0 (minimally difficult).

Table 5 displays data regarding the items selected as one of the three most difficult among the academic competencies and the performance competencies, grouped by course and by semester. The items selected are heavily concentrated in two courses, Kinesiology and Neurocardiopulmonary, and in the second and third semesters.

In both tables 4 and 5, fourth semester courses are combined because they are team-taught in lecture format with overlapping content areas, and are all predominantly lecture courses.

Table 4

Level of difficulty, by course

Course	Number of items from the course	Mean score
Introduction to PTA		
Academic	6	2.94
Laboratory/performance	3	1.94
Total	9	2.61
Physical Agents		
Academic	7	2.79
Laboratory/performance	6	2.56
Total	13	2.68
Kinesiology		
Academic	11	3.19
Laboratory/performance	3	3.39
Total	14	3.23
Therapeutic Exercise		
Academic	4	2.96
Laboratory/performance	8	2.77
Total	12	2.83

Table 4 (continued)

Level of difficulty, by course

Course	Number of items from the course	Mean score
Orthopedics		
Academic	3	3.39
Laboratory/performance	3	3.28
Total	6	3.33
Neurocardiopulmonary		
Academic	7	3.63
Laboratory/performance	7	3.38
Total	14	3.51
Applied Kinesiology		
Academic	6	3.06
Laboratory/performance	3	2.42
Total	9	2.80
Fourth Semester courses		
Academic	5	2.62
Laboratory/performance	3	2.50
Total	8	2.60

Neurocardiopulmonary (3.51), Orthopedics (3.33) and Kinesiology (3.23) had the highest mean ratings of difficulty. The other five courses had mean ratings between 2.60 and 2.83.

Table 5

Number of items rated as one of the three most difficult, by course and by semester

	<u>Items rated as one of the three most difficult</u>		
	Academic	Laboratory/ performance	Total
<u>Course</u>			
Neurocardiopulmonary	4	9	13
Kinesiology	10	2	12
Therapeutic Exercise	1	2	3
Applied Kinesiology	2	1	3
Physical Agents	0	3	3
Intro to PTA	1	0	1
Orthopedics	0	1	1
Fourth semester	0	0	0
<u>Semester</u>			
First	1	3	4
Second	11	5	16
Third	6	10	16
Fourth	0	0	0

Items rated as one of the three most difficult in academic and laboratory content are highly concentrated in two courses: Neurocardiopulmonary (13) and Kinesiology (12). These items are heavily concentrated in second and third semester courses (32 of 36).

*Lab vs. lecture.* In Table 4, respondents' mean ratings for laboratory/performance items were lower than ratings for academic items in all courses with the exception of Kinesiology. The overall mean score for all academic items was 3.12; for lab items, it was 2.85. Table 6 shows means for lab and academics for each respondent. Based on the mean ratings, all six respondents rated lecture-based academic content as more difficult than laboratory content, although the difference is very small with three respondents.

The percentage of responses for each rating option from "1" through "5" were calculated for performance/laboratory skills and academic skills. 34.2 percent of laboratory items were rated "1" or "2" (easy or very easy), compared to 25.2 percent of academic items. 37.6 percent of academic items were rated as "4" or "5" (moderately or extremely difficult), as compared to 27.9 percent of laboratory items. Figure 1 presents this data in graphic form.

*Assessment techniques.* Using the same criteria as for academic and laboratory items, three items were given difficulty ratings of "4" or "5" by at least four of the respondents: essay and short answer tests (mean rating of 4.0), performance skill check-offs with no rubric (mean rating of 4.0), and laboratory practical examinations with problems distributed 15 minutes before performance (mean rating of 4.0). Assessment techniques with the lowest mean difficulty rating were peer (2.33) and self (2.67) assessments of laboratory check-offs, and group assignments and tests (2.83).



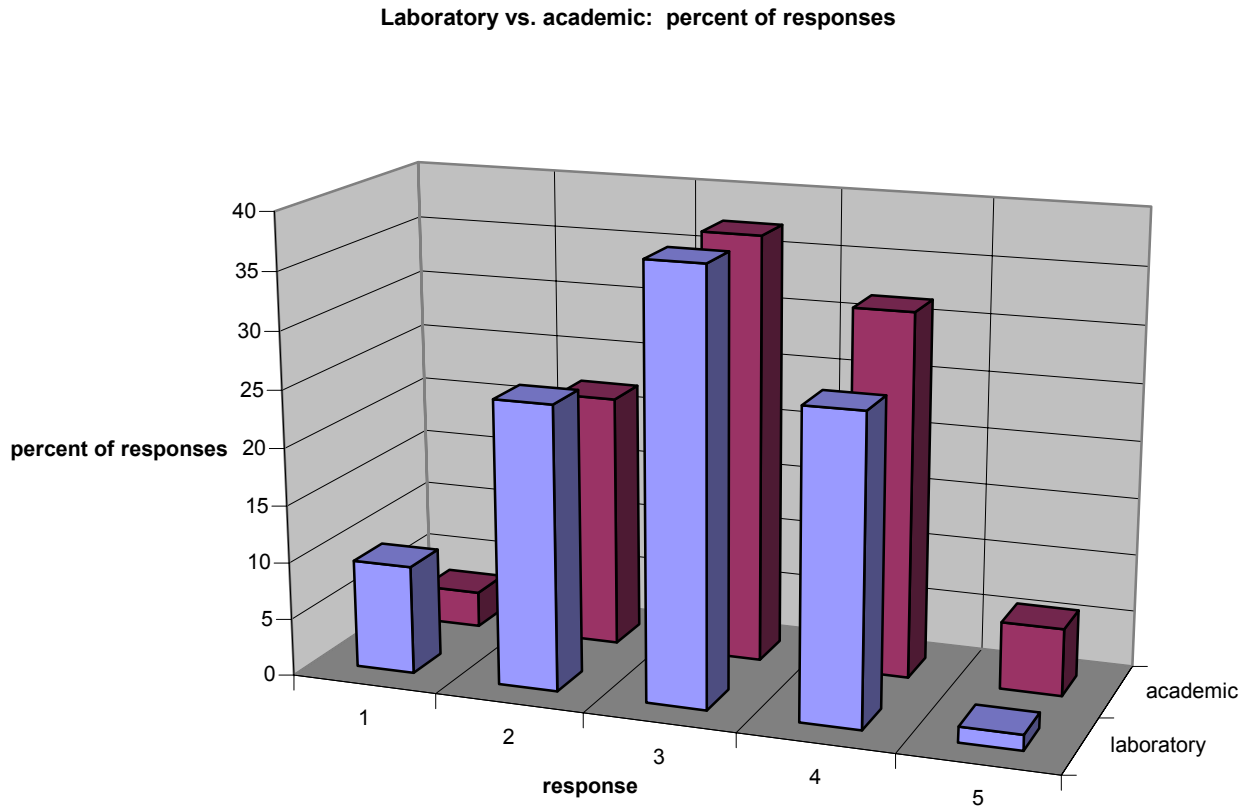
Table 6

Mean ratings for academic vs. laboratory items, by respondent

respondent	academic	laboratory
1	3.35	2.97
2	2.84	2.78
3	3.22	2.70
4	3.08	3.00
5	3.57	2.91
6	2.82	2.76
All	<u>3.12</u>	<u>2.85</u>

Each respondent gave a higher mean rating of difficulty to academic items than to laboratory items. The highest mean rating of difficulty by any respondent for laboratory items was 3.00. Four of the six respondents gave academic items a mean rating of difficulty higher than 3.00.

Figure 1



The percent of “4” and “5” responses (moderately or extremely difficult) was higher for academic than for laboratory (performance) items on the instrument, while the percent of “1” and “2” responses (very easy or easy) was higher for laboratory than for academic items. Items rated minimally difficult (“3”) were essentially equal for academic and laboratory content.

*Instructional methods.* Using the same criteria as for academic and laboratory items, only two instructional methods items were given difficulty ratings of “4” or “5” by at least four of the respondents: lecture only format (mean rating of 3.83), and scheduling the entire week of course content on one day (mean rating of 4.17). All other instructional methods had mean difficulty ratings of less than 3.0. Preferred instructional methods and their mean ratings were field trips (2.0), small group discussions in class (2.16), group projects (2.2), computer-based supplementary materials (2.2), one-on-one discussion with instructor (2.33), laboratory practice with instructor feedback (2.33), and lab practice with fellow students (2.33).

### *Question three*

*What Accommodations Have Been Made or Could Be Made for Students with LD in the Areas of Difficulty Found in this Study?*

All respondents reported using pre-printed lecture outlines, three-dimensional anatomical models, and extra open lab hours while in the program; all of these learning strategies were offered to all program students without needing to reveal a disability or request services from Special Needs. Other learning options offered to all students which the respondents reported using included audio-taping lectures (five of six), peer study groups (four), instructor tutoring (four), peer tutoring (two), quiet isolated area for lab practical examinations (three), computer-based supplementary instruction (one).

Respondents reported using the following accommodations which were arranged through the Special Needs office and are not routinely offered to all students: extended time for written exams (six of six), quiet, isolated location for written exams (six), note taker service (four), assistance with completing Scantron forms (three), oral testing (two),

extended time for documentation for lab performance (two), special seating arrangements (three), and permission to make oral presentations before a limited audience (one).

Accommodations not requested or used by any of the respondents were videotaping of classes and magnified tests. Several respondents answered that they wished they had known of or made use of some of the accommodations listed on the instrument. These included extended documentation time, isolated location for lab practical examinations, computer-based supplemental materials, and permission to use a clear goniometer backwards to facilitate reading numbers correctly. Four respondents reported successfully using flash cards as an aid to learning, while the other two reported that flash cards did not help them.

Respondents were asked to make suggestions which they believed would help future program students. Their suggestions are broken down into program accommodations and learning/studying suggestions for future students. All of their suggestions are listed in Table 7.

Table 7

Suggested Accommodations and Study Aids for Future Students

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Program accommodations

- Saturday morning open labs with instructors or lab assistants present.
- Allow/encourage students with LD to go part-time or take longer than two years to complete the program. This was not an option when I entered.
- Change content of 4<sup>th</sup> semester to emphasize patient progression instead of psychosocial issues.
- Audiotape or videotape lectures to reinforce and fill in gaps with notes.
- Illustrated textbooks, workbooks, and study guides are helpful as reinforcement.
- Allow students to use word processor to do documentation in lab and in clinicals. Writing was hard for me and draining mentally to have to use pen and paper/lab journal.
- Recruit program graduates as mentors.
- Have program graduates act as one-on-one tutors, matched by instructors.

Study suggestions for students

- Color-coding for learning muscle origins and insertions, nerves.
- Don't let embarrassment keep you back from asking instructors for additional help.
- Read the textbook before the lectures will greatly help!
- Take tutoring center sessions on time management, organization, study skills.

- Use tutors from tutoring center and second year students.
- Use special needs audio tape dubbing service.
- Take Gateway courses like speed reading, note taking, shorthand.
- Skim questions on old tests and at end of chapter before reading text to help recognize important answers as you read.
- Develop acronyms for memorization.
- I used paragraph keying (notes and symbols in margins of readings and notes, using colors) as a visual memory tool.
- Use color-clear bookmarks when reading, to help focus.

## *Discussion*

### *Incidence of Learning Disabilities*

Incidence of students with LD among those students completing at least a year of the program was 10.6 percent, a rate much higher than those reported in literature. There may be additional program students who have received services for learning disabilities but did not self-disclose their disabilities to the investigator. These findings are consistent with reviewed literature which suggests that the incidence of diagnosed and recognized LD is lower than student self-reported incidence or actual incidence (Pastor & Reuben, 2002; Henderson, 1995, 1999; Vogel et al., 1998; Young, 1996).

### *Areas of Difficulty for Students with LD*

Academic competencies were rated as more difficult than laboratory competencies. The respondents' mean ratings were higher for academic/lecture skills than for performance/laboratory skills. Each respondent gave academic content a higher mean rating than laboratory content. 37.6 percent of responses to academic items gave a rating of moderately or extremely difficult, as opposed to 27.9 percent of laboratory items.

An area of difficulty reported in the literature for students with LD is written tests, but this was not rated highly difficult by the respondents. All six respondents reported taking advantage of testing accommodations (quiet room and unlimited time) and three of them received assistance in completing Scantron forms. With these accommodations, multiple choice exams had a mean rating of 3.17, slightly above the "minimally difficult" rating and lower than most of the other assessment techniques. However, time pressure was a feature of other items which had high mean ratings of difficulty. Lab check-offs

without a rubric and lab practical exams with only 15 minutes to prepare before performance were two of the three most difficult assessment techniques in terms of mean rating (4.00 each); both of these performance activities have time limits. Scheduling of an entire week's lecture and lab on one day had a very high mean rating of difficulty (4.17).

32 of the 36 items rated as one of the three most difficult academic or laboratory competencies were in courses in the second and third semesters, and 25 of those items were concentrated in only two courses: Kinesiology (2<sup>nd</sup> semester) and Neurocardiopulmonary Concepts (3<sup>rd</sup> semester).

A limitation to the value of this investigation is the lack of corresponding data for students without LD. General conclusions cannot be drawn regarding differences between areas of difficulty for students with LD vs. students without LD.

#### *Potential Accommodations*

Respondents reported effectively utilizing a variety of learning aids offered to all program students, and accommodations arranged through the Special Needs office. They also reported attempting to use strategies and accommodations which did not prove successful for them. One respondent expressed that the wish that the program had offered the option of completing the program on a part-time basis.



## CHAPTER V

### Summary, Conclusions, and Recommendations

#### *Summary of the Study*

##### *Restatement of the Problem*

Increasing numbers of students with disabilities have entered post-secondary educational programs since the passage of the Americans with Disabilities Act. Individuals with learning disabilities (LD) make up the largest and fastest growing group among college students with disabilities. They have entered and succeeded as students and professionals in the fields of medicine and allied health. Limited research exists on students with LD in allied health programs, particularly in the field of physical therapy. Published articles on incidence of LD among college students have reported widely varied numbers, and none of these has focused on physical therapist assistant (PTA) programs. The basic competencies and assessment methods in PTA have not been analyzed to determine which areas are most difficult for students with LD. The only article on accommodations in physical therapy education addressed only physical therapist programs, not PTA programs.

This is a study of students with learning disabilities in an associate degree program for physical therapist assistants to determine the incidence of LD, the areas of difficulty for these students in the program, and accommodations which they believed helped them or would help other students with LD.

##### *Methods and Procedures*

A survey instrument was developed which included areas of academic and laboratory content, assessment techniques, and instructional methods on which

respondents were asked to rate the difficulty of the item on a one (very easy) to five (extremely difficult) scale. The instrument also included a section on accommodations used by the respondents and potential accommodations which they did not use. Seven students and former students were invited by mail to participate in the study; these were all of the individuals who had completed at least one year of the program and had revealed their disability to the instructor. Six of the seven potential subjects agreed to participate. The instrument was administered orally by the investigator. The respondent and the investigator simultaneously completed the written form and then compared forms to reconcile any discrepancies. Items on the instrument with the highest mean ratings, items rated as “moderately difficult” or “extremely difficult” by at least four of the six respondents, and items selected as one of the three hardest items in each area were considered to be the most difficult.

### *Major Findings*

10.6 percent of all students who had completed at least one year of the Gateway PTA program received services for LD and revealed their disability to the investigator.

17 of the 49 academic items were rated as difficult. Three of these items represented competencies primarily taught in required general education courses rather than program courses. Six of these 17 items deal with anatomy. Other academic items rated as difficult include pathology, and technical writing skills.

Performance (laboratory) competencies were generally rated easier than academic competencies taught in lecture format. Mean rating of difficulty for laboratory skills was 2.85, as opposed to 3.12 for academics. 13 of 37 performance items were listed as difficult, although five of these were listed because only one respondent rated the item as

one of the three most difficult. Of the other eight performance items rated as difficult, almost all involved patient assessment, measurement, and progression.

In the area of assessment, tests with time pressure and open-ended questions presented the most problems for the respondents. Students with LD were allowed to take written tests without time limits; mean rating for written tests was 3.17. There were laboratory tests in which time to prepare and time to perform were restricted; mean rating of difficulty for both of these items was 4.0.

Several other time pressure issues scored high for difficulty. Scheduling an entire week's course meetings on one day made learning more difficult, according to the respondents. The vast majority of the items rated as most difficult were concentrated in the second and third semesters (32 of 36 items) and in only two courses, Kinesiology and Neurocardiopulmonary (25 of 36 items).

The accommodations used most often by the respondents were extended time for tests, assistance with Scantron forms, oral testing, and note-takers. They also reported the use of other forms of assistance which were offered to all students but which might require a formal request for accommodation in another program or institution: pre-printed lecture notes, three-dimensional anatomical models, extra lab hours, peer and instructor tutoring, and audio-taping lectures. A wide variety of other possible accommodations and study suggestions were proposed by the respondents, including extended time for program completion, open lab with assistants present, mentoring, instructors matching program graduates with students needing tutors, tape dubbing service, reading aloud, and other helps with memorization content.

### *Conclusions*

Incidence of students with LD within this population was much higher than rates reported in literature, although many authors believe that the numbers of students with LD are still being underreported.

Based on their ratings the academic areas which were the most difficult for the respondents were competencies requiring memorization, precision, attention to multiple details, conceptualization, and visual-spatial integration. Laboratory competencies requiring patient assessment and progression and strong visual-spatial integration were rated as most difficult. Assessment techniques which included time limits or pressure had higher ratings of difficulty than those with no time limits. The lecture-only format was the only instructional method with a high rating of difficulty, while techniques involving interaction with instructors and peers, hands-on practice, and observation were rated the least difficult.

Difficult competencies in the Gateway PTA program were found disproportionately in two courses in the second and third semesters. The concentration of difficult items in two courses may augment the intrinsic difficulty of those items, and may make those two semesters particularly challenging for students with LD. On the other hand, there were no items of academic content in the fourth semester which were rated as difficult.

Respondents made successful use of the majority of learning aids and formal accommodations offered, but suggested many others which they did not try or were not offered while they were students in the program.

## *Recommendations*

### *Recommendations Related to this Study*

1. The high incidence of students with learning disabilities mandates that program instructors anticipate the presence of students with LD in each new entering class, be observant for signs of LD within the student population, and be open to requests for service and accommodations.

2. The lecture-only format was the only instructional method with a high rating of difficulty. Students with LD should make use of their preferred methods of taking in and studying material presented in lecture format. Instructors should seek out further teaching materials, techniques and suggestions to minimize the amount of material presented in lecture-only format.

3. Assessment techniques with time pressure and limits were particularly difficult for students with LD. Where they are not essential, time limitations should be modified or eliminated. Students with LD may reduce the difficulty of assessments with time limits by improving their time management skills.

4. Respondents suggested many learning strategies and accommodations which they believed would have helped them and could help future program students with LD.

### *Recommendations for Further Study*

Based on the results of this investigation, further study is recommended into a number of questions. What is the incidence of LD among students and graduates of other PT and PTA education programs or nationwide? Are the areas of difficulty reported in this investigation similar to those found in other PTA programs? Are time limits appropriate for testing of laboratory skills among allied health students with LD? Does

the use of real patients during laboratory teaching and student assessment in PT and PTA education enhance learning? How are program learning outcomes influenced by wide variation of levels of difficulty among program courses? Are computer-generated simulated patients effective for teaching academic and laboratory content? How well do physical therapy and other allied health graduates with LD perform as practitioners and on licensing examinations, as compared to graduates without LD?

Individuals with LD are a significant and permanent presence in PTA education, who have been effective and successful as students and practitioners. Programs and instructors need to continue to assess and adapt their own methods to meet the needs of students with LD.

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APPENDIX A

**Degree of difficulty of components of the Gateway Technical College Physical Therapist Assistant program**

Part One

**Directions:** Next to each item, circle the number which indicates how difficult the item was for you as a PTA student. If you do not remember or if the item was not part of the program when you were in it, please circle N/A. Circle a response for each item.

1 = very easy.                      2 = easy.                      3 = minimally difficult.                      4 = moderately difficult.  
 5 = extremely difficult.                      N/A = no answer, don't remember

Academic content

1. documentation.....	1	2	3	4	5	N/A
2. goal writing.....	1	2	3	4	5	N/A
3. professional literature; research.....	1	2	3	4	5	N/A
4. writing research papers.....	1	2	3	4	5	N/A
5. aseptic technique; standard precautions; isolation	1	2	3	4	5	N/A
6. ethics and law; PT/PTA relations.....	1	2	3	4	5	N/A
7. musculoskeletal anatomy.....	1	2	3	4	5	N/A
8. neuroanatomy.....	1	2	3	4	5	N/A
9. physics; levers, force diagrams, torque.....	1	2	3	4	5	N/A
10. physiology of pain; gate theory.....	1	2	3	4	5	N/A
11. inflammation, & healing.....	1	2	3	4	5	N/A
12. theory of heat and cold treatments.....	1	2	3	4	5	N/A
13. ultrasound theory and physiology.....	1	2	3	4	5	N/A
14. electromagnetic spectrum: ultraviolet, infrared	1	2	3	4	5	N/A
15. bioelectricity; biofeedback; e-stim; TENS; IFC	1	2	3	4	5	N/A
16. theory/physiology of traction.....	1	2	3	4	5	N/A
17. cardinal planes and axes; joint motions.....	1	2	3	4	5	N/A
18. physiology/anatomy of motor function.....	1	2	3	4	5	N/A
19. muscle origins and insertions.....	1	2	3	4	5	N/A
20. prime movers, assisting movers; reversals.....	1	2	3	4	5	N/A
21. force couples; synergies.....	1	2	3	4	5	N/A
22. substitutions and compensations.....	1	2	3	4	5	N/A
23. open/closed chain; eccentric/concentric.....	1	2	3	4	5	N/A
24. joint anatomy; open/close packed; mobilization	1	2	3	4	5	N/A
25. osteo/artho kinematics; convex/concave.....	1	2	3	4	5	N/A
26. exercise types: PNF; plyometrics; PRE's.....	1	2	3	4	5	N/A
27. isometric, isotonic, isokinetic exercise.....	1	2	3	4	5	N/A
28. patient progression.....	1	2	3	4	5	N/A
29. home exercise programs.....	1	2	3	4	5	N/A
30. function vs. impairment.....	1	2	3	4	5	N/A
31. orthopedic pathology and assessment.....	1	2	3	4	5	N/A
32. stages of rehabilitation; max/mod/min protection	1	2	3	4	5	N/A
33. neurotreatment theories: NDT; Brunstrom, Rood	1	2	3	4	5	N/A
34. neurological pathology and assessment.....	1	2	3	4	5	N/A
35. cardiopulmonary function and pathology.....	1	2	3	4	5	N/A

	very easy			extremely difficult		
36. amputee pathology.....	1	2	3	4	5	N/A
37. anatomy/physiology of spinal cord injury.....	1	2	3	4	5	N/A
38. anatomy/physiology of stroke, brain trauma.....	1	2	3	4	5	N/A
39. normal gait.....	1	2	3	4	5	N/A
40. dysfunctional gait.....	1	2	3	4	5	N/A
41. balance and righting reactions.....	1	2	3	4	5	N/A
42. energy consumption and conservation.....	1	2	3	4	5	N/A
43. interventions in gait training.....	1	2	3	4	5	N/A
44. motor learning theory.....	1	2	3	4	5	N/A
45. psychosocial aspects of disability & rehab...	1	2	3	4	5	N/A
46. discharge planning.....	1	2	3	4	5	N/A
47. growth, development, maturation.....	1	2	3	4	5	N/A
48. pediatric assessment and treatment.....	1	2	3	4	5	N/A
49. geriatrics.....	1	2	3	4	5	N/A

---

Write the numbers of the three items above which were the most difficult for you to learn while in the PTA program.

\_\_\_\_\_



Lab and clinical skills

**Directions:** Next to each item, circle the number which indicates how difficult the item was for you as a PTA student. If you do not remember or if the item was not part of the program when you were in it, please circle N/A. Circle a response for each item.

1 = very easy.                      2 = easy.                      3 = minimally difficult.                      4 = moderately difficult.  
 difficult.                      5 = extremely difficult.                      N/A = no answer, don't remember

1. transfers, transfer training and body mechanics..	1	2	3	4	5	N/A
2. vital signs, tilt table.....	1	2	3	4	5	N/A
3. sterile technique and wound/burn care.....	1	2	3	4	5	N/A
4. heat and cold modalities.....	1	2	3	4	5	N/A
5. ultrasound treatment.....	1	2	3	4	5	N/A
6. ultraviolet; infrared; diathermy.....	1	2	3	4	5	N/A
7. NMES, TENS, IFC, biofeedback.....	1	2	3	4	5	N/A
8. mechanical traction.....	1	2	3	4	5	N/A
9. massage.....	1	2	3	4	5	N/A
10. range of motion measurement/goniometry.....	1	2	3	4	5	N/A
11. manual muscle testing.....	1	2	3	4	5	N/A
12. palpation for anatomical landmarks & for pain....	1	2	3	4	5	N/A
13. passive range of motion; stretching.....	1	2	3	4	5	N/A
14. strengthening & progressive resistive exercise...	1	2	3	4	5	N/A
15. exercise applications: PNF; plyometrics.....	1	2	3	4	5	N/A
16. Swiss ball applications.....	1	2	3	4	5	N/A
17. assessment and treatment of posture.....	1	2	3	4	5	N/A
18. assessment & treatment of balance/coordination	1	2	3	4	5	N/A
19. bed and floor mobility training.....	1	2	3	4	5	N/A
20. ob/gyn rehab and progression.....	1	2	3	4	5	N/A
21. orthopedic assessment; special tests.....	1	2	3	4	5	N/A
22. pain assessment: rating; location; motion tests	1	2	3	4	5	N/A
23. post-surgery, post-injury rehab & progression...	1	2	3	4	5	N/A
24. gait analysis.....	1	2	3	4	5	N/A
25. gait training; assistive devices.....	1	2	3	4	5	N/A
26. analysis of other types of mobility.....	1	2	3	4	5	N/A
27. pulmonary rehab & progression.....	1	2	3	4	5	N/A
28. cardiac rehab & progression.....	1	2	3	4	5	N/A
29. amputee treatment; limb wrapping.....	1	2	3	4	5	N/A
30. neuro-exercise applications: NDT; Brunstrom...	1	2	3	4	5	N/A
31. rehab & progression: CVA.....	1	2	3	4	5	N/A
32. other neuro rehabilitation and progression.....	1	2	3	4	5	N/A
33. rehab & progression: brain & spinal cord injury...	1	2	3	4	5	N/A
34. braces and orthotics.....	1	2	3	4	5	N/A
35. assessment of home environment.....	1	2	3	4	5	N/A
36. wheelchair assessment and fitting.....	1	2	3	4	5	N/A
37. acting as simulated patient for check-offs.....	1	2	3	4	5	N/A

Write the numbers of the three items above which were the most difficult for you to learn while in the PTA program.

\_\_\_\_\_

**Assessment techniques**

**Directions: Following each item listed below, circle the number which indicates how difficult the item was for you as a PTA student. Circle a response for each item**

1 = very easy.            2 = easy.            3 = minimally difficult.            4 = moderately difficult.  
 5 = extremely difficult.            N/A = no answer, don't remember

1. multiple choice exams.....	1	2	3	4	5	N/A
2. essay and short answer exams.....	1	2	3	4	5	N/A
3. walk-around exams (Ortho).....	1	2	3	4	5	N/A
4. written homework.....	1	2	3	4	5	N/A
5. paper patients.....	1	2	3	4	5	N/A
6. lab check-offs with detailed checklist (Physical Agents, Kines).....	1	2	3	4	5	N/A
7. lab check-offs without detailed checklist (Ther Ex, Neurocardio).....	1	2	3	4	5	N/A
8. lab practical exams, problems distributed in advance (Ortho 1997-99, Applied Kines final non-gait practical).....	1	2	3	4	5	N/A
9. lab practical exams, problems distributed 15 minutes before performance (Intro, Ther. Ex, Applied Kines gait exam, Neurocardio)..	1	2	3	4	5	N/A
10. lab practical exams with real patients (Ortho, 2000, 2001).....	1	2	3	4	5	N/A
11. research papers and projects.....	1	2	3	4	5	N/A
12. group assignments (paired tests in Intro, group check-offs, Applied Kines projects 2000 & 2001).....	1	2	3	4	5	N/A
13. self-assessment following check-offs.....	1	2	3	4	5	N/A
14. peer assessment following check-offs or presentations.....	1	2	3	4	5	N/A

Instructional methods

**Directions: Following each item listed below, circle the number which indicates how difficult the item was for you as a PTA student. Consider these items one by one and rate how easy or difficult it was for you to master the learning objectives using this particular format. Circle a response for each item**

1 = very easy.            2 = easy.            3 = minimally difficult.            4 = moderately difficult.  
5 = extremely difficult.            N/A = no answer, don't remember

1. lecture only	1	2	3	4	5	N/A
2. lecture followed by group discussion	1	2	3	4	5	N/A
3. question and answer during class	1	2	3	4	5	N/A
4. one-on-one discussion with instructor	1	2	3	4	5	N/A
5. laboratory instruction, demonstration	1	2	3	4	5	N/A
6. laboratory practice with instructor feedback	1	2	3	4	5	N/A
7. lab practice with fellow students	1	2	3	4	5	N/A
8. guest instructors	1	2	3	4	5	N/A
9. live patients with disabilities in lab	1	2	3	4	5	N/A
10. group projects	1	2	3	4	5	N/A
11. case studies	1	2	3	4	5	N/A
12. entire week of course content in one day	1	2	3	4	5	N/A

Part Two

Accommodations

Directions: after each of the following teaching/learning accommodations or approaches, place the following letters, based on your experience while in the PTA program. If these were never discussed or were not issues during your education, leave blank.

A = **accommodation** which you requested through Special Needs and was made for you.

B = accommodation which was offered, but which you did not use.

C = strategy or method offered or available to all students, which you used and which helped.

D = strategy or method which you tried which did not help.

E = accommodation you didn't request it but **wish** you had.

- |   |  |
|---|--|
| <input type="checkbox"/> pre-printed lecture outline & notes  | <input type="checkbox"/> note taker                                      |
| <input type="checkbox"/> extended time for tests              | <input type="checkbox"/> assistance in completing Scantrons              |
| <input type="checkbox"/> quiet, isolation for written tests   | <input type="checkbox"/> oral testing/oral assistance with written tests |
| <input type="checkbox"/> permission to audiotape lectures     | <input type="checkbox"/> quiet, isolated area for lab practical exams    |
| <input type="checkbox"/> videotaping of class on days absent  | <input type="checkbox"/> extended time for documentation                 |
| <input type="checkbox"/> three dimensional anatomical models  | <input type="checkbox"/> extra tutoring from instructors                 |
| <input type="checkbox"/> allowed to use goniometer backwards  | <input type="checkbox"/> peer tutors (other students)                    |
| <input type="checkbox"/> special seating arrangement in class | <input type="checkbox"/> oral presentations before limited group         |
| <input type="checkbox"/> magnified copies of tests            | <input type="checkbox"/> pre-printed copies of lecture notes             |
| <input type="checkbox"/> studying in peer groups              | <input type="checkbox"/> computer-based instruction or remediation       |
| <input type="checkbox"/> extra open lab times for practice    | <input type="checkbox"/> use of flash cards for memorization             |
| <input type="checkbox"/> (other) _____                        | <input type="checkbox"/> _____   |

Are there other accommodations, not mentioned above, which you think might be useful to future students?

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## APPENDIX B

### Interview Script

Thank you for agreeing to participate in this investigation. It is being conducted by (*me*) Jeff Kannel, the lead instructor of the Gateway Physical Therapist Assistant program, as part of the requirements for completing a master's degree in vocational education at the University of Wisconsin-Stout. The purpose of the study is to determine if there are areas in the PTA curriculum, teaching methods, or assessment procedures which are difficult for students with learning disabilities. Your responses should indicate how difficult each item was for you as a student, NOT how well you learned it or how well you know it now. You have been asked to participate because you completed at least one year of the PTA program and because you revealed your learning disability to the investigator while you were in the program. This interview is the extent of your activity and involvement in this investigation.

You have received a letter and a Consent Form which briefly outline the purposes and methods of the study. If you understand the explanation and agree to voluntarily participate in the interview, please sign the form it at this time. If you have decided not to participate, please tell me know, and we will go no further. [*Wait until done*].

I have given you the survey and a pen; I have a copy of the same form. I am going to read the instructions and the survey items orally, as you read them on the pages. I will ask you for your response to each item individually. Each of us will mark your response on our own form. Please answer each question, and answer it as it applies to your experience as a student in the Gateway PTA program. When we are finished, we will cross-check our forms to make sure that we are in agreement on all items. The form which I fill out is the one which will be used for data in the investigation. Yours will be destroyed. There is no information on the form will identify you.

If you are ready, let's begin Part One, with Academic Content. Remember that you are indicating how difficult each item was for you. [*Read the directions from the instrument and proceed*].

[*After first section, question 49*]. Now, I would like you to look back over all of the above items, 1 through 49, and choose the three which were the most difficult content areas for you to learn when you were a student. Write the numbers of those three items on the lines provided, and tell me when you are done.

[*After subject is done with this*]. We will now go on to the section of Lab and Clinical Skills. The instructions are the same as for the section just completed. Remember you are indicating how difficult each item was for you as a student. [*Read the directions from the instrument and proceed*].

[*After second section, question 37*]. Now, I would like you to look back over all of the above items, 1 through 37, and choose the three which were the most difficult lab or clinical skills for you to learn when you were a student. Write the numbers of those three items on the lines provided, and tell me when you are done.

[*After subject is done with this*]. We will now go on to the section of Assessment Techniques, testing. The instructions are the same as for the section just completed. Remember you are indicating how difficult each of the assessment methods was for you as a student. [*Read the directions from the instrument and proceed*].

[*After subject is done with this*]. We will now go on to the section of Instructional Methods. The instructions are slightly different for this section. Please indicate how easy or difficult it was for you to master the learning objectives for material which was taught using this particular format. [*Read the directions from the instrument and proceed*].

[*After subject is done with this*]. This is the last section, Part Two, Accommodations. [*Read the directions from the instrument and proceed*].

[*After subject is done with this*]. The survey is done. Let's compare our forms to make sure that I have filled mine out correctly.

[*Once completed, and corrected as needed*]. We have completed the interview. The form which I have filled out will be used for data in the investigation. The one which you have filled out will be shredded. Thank you very much for your participation. If you are interested in seeing the results and the final version of the survey, or if you have any future questions, please contact (*me*) Jeff Kannel, at 262-564-2482.

APPENDIX C

**Degree of difficulty of components of the Gateway Technical College Physical Therapist Assistant program—first draft**

**Part One**

Directions: Following each item listed below, circle the number which indicates how difficult the item was for you as a PTA student. Circle a response for each item

1 = very easy.      2 = easy.      3 = minimally difficult.  
4 = moderately difficult.      5 = extremely difficult.

**Academic content**

1. documentation.....	1	2	3	4	5
2. goal writing.....	1	2	3	4	5
3. professional literature; research.....	1	2	3	4	5
4. writing research papers.....	1	2	3	4	5
5. aseptic technique; standard precautions; isolation	1	2	3	4	5
6. ethics and law; PT/PTA relations.....	1	2	3	4	5
7. musculoskeletal anatomy.....	1	2	3	4	5
8. neuroanatomy.....	1	2	3	4	5
9. physics; levers, force diagrams, torque.....	1	2	3	4	5
10. physiology of pain; gate theory.....	1	2	3	4	5
11. inflammation, & healing.....	1	2	3	4	5
12. theory of heat and cold treatments.....	1	2	3	4	5
13. ultrasound theory and physiology.....	1	2	3	4	5
14. bioelectricity; biofeedback; e-stim; TENS; IFC	1	2	3	4	5
15. theory/physiology of traction.....	1	2	3	4	5
16. cardinal planes and axes; joint motions.....	1	2	3	4	5
17. physiology/anatomy of motor function.....	1	2	3	4	5
18. muscle origins and insertions.....	1	2	3	4	5
19. prime movers, assisting movers; reversals.....	1	2	3	4	5
20. force couples; synergies.....	1	2	3	4	5
21. substitutions and compensations.....	1	2	3	4	5
22. open/closed chain; eccentric/concentric.....	1	2	3	4	5
23. joint anatomy; open/close packed; mobilization	1	2	3	4	5
24. osteo/ortho kinematics; convex/concave.....	1	2	3	4	5
25. treatment theories: PNF; plyometrics; PREs.....	1	2	3	4	5
26. types of exercise.....	1	2	3	4	5
27. patient progression.....	1	2	3	4	5
28. home exercise programs.....	1	2	3	4	5
29. function vs. impairment.....	1	2	3	4	5
30. orthopedic pathology and assessment.....	1	2	3	4	5
31. stages of rehabilitation; max/mod/min protection	1	2	3	4	5
32. neurotreatment theories: NDT; Brunstrom, Rood	1	2	3	4	5
33. neurological pathology and assessment.....	1	2	3	4	5
34. cardiopulmonary function and pathology.....	1	2	3	4	5

35. amputee rehabilitation.....	1	2	3	4	5
36. anatomy/physiology of spinal cord injury.....	1	2	3	4	5
37. anatomy/physiology of stroke, TBI.....	1	2	3	4	5
38. normal gait.....	1	2	3	4	5
39. dysfunctional gait.....	1	2	3	4	5
40. balance and righting reactions.....	1	2	3	4	5
41. energy consumption and conservation.....	1	2	3	4	5
42. interventions in gait training.....	1	2	3	4	5
43. motor learning theory.....	1	2	3	4	5
44. psychosocial aspects of disability & rehab...	1	2	3	4	5
45. discharge planning.....	1	2	3	4	5
46. growth, development, maturation.....	1	2	3	4	5
47. pediatric assessment and treatment.....	1	2	3	4	5
48. geriatrics.....	1	2	3	4	5

**Lab and clinical skills**

1. transfers, transfer training and body mechanics..	1	2	3	4	5
2. vital signs, tilt table.....	1	2	3	4	5
3. sterile technique and wound/burn care.....	1	2	3	4	5
4. heat and cold modalities.....	1	2	3	4	5
5. ultrasound treatment.....	1	2	3	4	5
6. UV; IR; diathermy.....	1	2	3	4	5
7. NMES, TENS, IFC, biofeedback.....	1	2	3	4	5
8. mechanical traction.....	1	2	3	4	5
9. massage.....	1	2	3	4	5
10. range of motion measurement/goniometry...	1	2	3	4	5
11. manual muscle testing.....	1	2	3	4	5
12. palpation for anatomical landmarks, & for pain.	1	2	3	4	5
13. passive range of motion; stretching.....	1	2	3	4	5
14. strengthening exercises; progressive resistive ex.	1	2	3	4	5
15. exercise applications: PNF; plyometrics.....	1	2	3	4	5
16. assessment and treatment of posture & balance	1	2	3	4	5
17. bed and floor mobility training.....	1	2	3	4	5
18. orthopedic assessment; special tests.....	1	2	3	4	5
19. pain assessment: rating; location; motion tests	1	2	3	4	5
20. neuro-exercise applications: NDT; Brunstrom	1	2	3	4	5
21. post-surgery, post-injury rehab & progression.	1	2	3	4	5
22. gait analysis.....	1	2	3	4	5
23. gait training; bracing; devices; intervention...	1	2	3	4	5
24. analysis of other types of mobility.....	1	2	3	4	5
25. respiratory.....	1	2	3	4	5
26. cardiac rehab treatment.....	1	2	3	4	5
27. amputee treatment; limb wrapping.....	1	2	3	4	5
28. neuro-rehabilitation: CVA, ALS, Parkinson's..	1	2	3	4	5
29. neuro rehabilitation: brain & spinal cord injury	1	2	3	4	5
30. evaluation of home environment.....	1	2	3	4	5



### **Instructional methods**

1. lecture	1	2	3	4	5
2. laboratory instruction	1	2	3	4	5
3. laboratory practice	1	2	3	4	5
4. visiting instructors	1	2	3	4	5
5. live patients in class	1	2	3	4	5
6. video instruction	1	2	3	4	5
7. computer-based support materials	1	2	3	4	5
8. professional literature reviews	1	2	3	4	5
9. research papers	1	2	3	4	5
10. research projects	1	2	3	4	5
11. acting as simulated patient	1	2	3	4	5
12. field trips (if applicable)	1	2	3	4	5
13. small group discussions in class	1	2	3	4	5
14. group projects	1	2	3	4	5

### **Assessment techniques**

1. multiple choice exams	1	2	3	4	5
2. essay and short answer exams	1	2	3	4	5
3. walk-around exams (Ortho)	1	2	3	4	5
4. written homework	1	2	3	4	5
5. lab check-offs (Physical Agents, Kines)	1	2	3	4	5
6. lab check-offs without checklist (Ther Ex, Neurocardio)	1	2	3	4	5
7. lab practical exams, (Intro, Ther Ex, Applied Kines, Neurocardio, Ortho)	1	2	3	4	5
8. lab practical exams with real patients (Ortho, 1999- )	1	2	3	4	5
9. research papers and projects	1	2	3	4	5
10. group projects (paired tests in Intro, group check-offs, Ther Ex)	1	2	3	4	5

## **Part Two**

Directions: Under each of the two sections below, mark the three items which were the most difficult for you as a student in the PTA program. Do not refer back to the earlier pages as you answer these questions.

### **Academic content**

- |   |  |
|---|--|
| <input type="checkbox"/> documentation                            | <input type="checkbox"/> treatments: PNF; plyometrics; PREs      |
| <input type="checkbox"/> goal writing                             | <input type="checkbox"/> types of exercise                       |
| <input type="checkbox"/> professional literature; research        | <input type="checkbox"/> patient progression                     |
| <input type="checkbox"/> writing research papers                  | <input type="checkbox"/> home exercise programs                  |
| <input type="checkbox"/> aseptic technique; standard precautions; | <input type="checkbox"/> function vs. impairment                 |
| isolation   | <input type="checkbox"/> orthopedic pathology and assessment     |
| <input type="checkbox"/> ethics and law; PT/PTA relations         | <input type="checkbox"/> stages of rehab; max/mod/min protection |
| <input type="checkbox"/> musculoskeletal anatomy                  | <input type="checkbox"/> neuro treatment theories: NDT;          |
| <input type="checkbox"/> neuroanatomy                             | Brunstrom, Rood  |
| <input type="checkbox"/> physics; levers, force diagrams, torque  | <input type="checkbox"/> neurological pathology and assessment   |
| <input type="checkbox"/> physiology of pain; gate theory          | <input type="checkbox"/> cardiopulmonary function and pathology  |
| <input type="checkbox"/> inflammation, & healing                  | <input type="checkbox"/> amputee pathology                       |
| <input type="checkbox"/> theory of heat and cold treatments       | <input type="checkbox"/> anatomy/physiology of spinal cord       |
| <input type="checkbox"/> ultrasound theory and physiology         | injury   |
| <input type="checkbox"/> bioelectricity; biofeedback              | <input type="checkbox"/> anatomy/physiology of stroke, TBI       |
| <input type="checkbox"/> e-stim; TENS; IFC                        | <input type="checkbox"/> normal gait                             |
| <input type="checkbox"/> theory/physiology of traction            | <input type="checkbox"/> dysfunctional gait                      |
| <input type="checkbox"/> cardinal planes and axes; motions        | <input type="checkbox"/> balance and righting reactions          |
| <input type="checkbox"/> neurophysiology of motor function        | <input type="checkbox"/> energy consumption and conservation     |
| <input type="checkbox"/> muscle origins and insertions            | <input type="checkbox"/> interventions in gait training          |
| <input type="checkbox"/> prime movers, assisting movers;          | <input type="checkbox"/> motor learning theory                   |
| reversals.  | <input type="checkbox"/> psychosocial aspects of disability &    |
| <input type="checkbox"/> force couples; synergies                 | rehab  |
| <input type="checkbox"/> substitutions and compensations          | <input type="checkbox"/> discharge planning                      |
| <input type="checkbox"/> open/closed chain; eccentric/concentric  | <input type="checkbox"/> growth, development, maturation         |
| <input type="checkbox"/> joint anatomy; open/close packed;        | <input type="checkbox"/> pediatric assessment and treatment      |
| mobilization  | <input type="checkbox"/> geriatrics                              |
| <input type="checkbox"/> osteo/artho kinematics; convex/concave   |  |
| relations   |  |

## **Lab and clinical skills**

- \_\_\_ transfers and body mechanics
- \_\_\_ vital signs, tilt table
- \_\_\_ sterile technique and wound/burn care
- \_\_\_ heat and cold modalities
- \_\_\_ ultrasound treatment
- \_\_\_ UV; IR; diathermy
- \_\_\_ NMES, TENS, IFC, biofeedback
- \_\_\_ mechanical traction
- \_\_\_ massage
- \_\_\_ ROM measurement/goniometry
- \_\_\_ manual muscle testing
- \_\_\_ palpation for landmarks, & for pain
- \_\_\_ passive range of motion
- \_\_\_ stretching
- \_\_\_ strengthening exercises; PRE
- \_\_\_ exercise applications: PNF; plyometrics
- \_\_\_ assessment/treatment of posture & balance
- \_\_\_ bed and floor mobility training
- \_\_\_ orthopedic assessment; special tests
- \_\_\_ pain assessment: rating; location; motion tests
- \_\_\_ neuro exercise applications: NDT; Brunstrom; Rood.
- \_\_\_ post-surgery, post-injury rehab
- \_\_\_ gait analysis
- \_\_\_ gait training; braces; devices; intervention
- \_\_\_ analysis of other types of mobility
- \_\_\_ respiratory treatment
- \_\_\_ cardiac rehab treatment
- \_\_\_ amputee treatment; limb wrapping
- \_\_\_ neuro-rehabilitation: CVA; ALS; Parkinson's
- \_\_\_ neuro rehab: traumatic brain & spinal cord injuries
- \_\_\_ evaluation of home environment

**Accommodations**

Directions: after each of the following teaching/learning accommodations, place the following letters, based on your experience.

R = accommodation which you **requested** but were not allowed to use

A = **accommodation** which you requested and was made for you

W = accommodation you didn't request it but **wish** you had.

- |   |  |
|---|--|
| <input type="checkbox"/> extended time for tests              | <input type="checkbox"/> assistance in completing Scantrons      |
| <input type="checkbox"/> quiet, isolation for written tests   | <input type="checkbox"/> oral testing/oral assistance in tests   |
| <input type="checkbox"/> permission to audiotape lectures     | <input type="checkbox"/> quiet, isolated area for lab exams      |
| <input type="checkbox"/> videotaping of class on days absent  | <input type="checkbox"/> extended time for documentation         |
| <input type="checkbox"/> three dimensional anatomical models  | <input type="checkbox"/> extra tutoring from instructors         |
| <input type="checkbox"/> allowed to use goniometer backwards  | <input type="checkbox"/> peer tutors (other students)            |
| <input type="checkbox"/> special seating arrangement in class | <input type="checkbox"/> oral presentations before limited group |
| <input type="checkbox"/> (other) _____                        | _____  |

Are there other accommodations, not mentioned above, which you think might be useful to future students?

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## APPENDIX D

3520 30<sup>th</sup> Ave.  
Kenosha, WI 53144  
March 27, 2002

Dear

In partial fulfillment of the requirements for a masters degree in vocational education from the University of Wisconsin—Stout, I am doing an investigation of physical therapist (PTA) students with learning disabilities (LD). I am studying areas of difficulty for students with LD in the content, teaching methods, and assessment techniques used in the Gateway Technical College PTA program. I am also investigating accommodations which have been or could be used by PTA students with LD. I hope the results will help the program to deal more effectively with future students, especially students with LD. I also hope that it will help me become a better teacher.

You are receiving this letter because you completed at least one year of the PTA program, and because you made your learning disability known to me, either directly or via requests for accommodations through the Special Needs office. I would like to invite you to be part of this study by completing a survey form on areas of difficulty for you as a student in the PTA program. Your participation is voluntary; you are under no obligation to me or the program to participate.

The research survey will be completed during an interview, conducted in a quiet, private area on the Kenosha campus; the total time required will be 30-45 minutes. By using an interview format I hope to make it more interesting than filling out a form all alone, and to assure that all questions are answered and the form is correctly filled out. I want you to feel free to respond to the survey honestly and freely. For that reason, I have asked Mary Hawkins from Special Needs to conduct interviews with anyone who, for whatever reason, would prefer to be interviewed by her. For her interviews, Mary will send me the completed forms in her handwriting, with nothing identifying the person she interviewed.

Enclosed are two copies of a consent form. Please read the form completely. After reading this letter and the form, if you have any questions about your participation in this study, please feel free to call me at 262-564-2482. If you are willing to participate, please check the “informed consent” line on the form; if you decide not to participate, then check the “decline to participate” line on the consent form. Return the checked and signed form to me in the enclosed envelope as soon as possible; keep the other copy of the form for yourself.

If you agree to participate, I will contact you after receiving the consent form to set up an interview time. If you decline to participate, there will be no further contact regarding this study.

I thank you in advance for your assistance in pursuing my educational goals and in improving the PTA program.

Sincerely,

Jeff Kannel, PT

Encl: consent forms, envelope

APPENDIX E  
**Consent Form**

Jeffrey A. Kannel, director of the Gateway Technical College Physical Therapist Assistant (PTA) program, is conducting research on areas of difficulty for PTA program students with learning disabilities. You are being asked to consider completing a survey to rate the difficulty of the academic content, lab and clinical skills, assessment techniques, and instructional methods in the program. You will also be asked questions regarding accommodations. This survey will be administered to you in a one-on-one interview, conducted by either Mr. Kannel or Mary Hawkins, at your option. It will take a total of 30 to 45 minutes to complete. Before deciding whether or not to participate in the interview, please read this consent form and the attached cover letter completely. If you have any questions, contact Mr. Kannel, the investigator, at 262-564-2482.

Risks There is little or no risk in your participation in the interview and completion of the questionnaire. The questionnaire requests no information of a personal nature.

Benefits Although the results of this study may be of benefit to future physical therapist assistant students and the Gateway PTA program, there is no direct benefit to you for participating in this research.

Confidentiality Only the interviewers will know of your participation. There will be no identifying information from you on the survey form. The form used for data analysis will be completed by your interviewer, in his or her handwriting. If for any reason you prefer not to be interviewed by Mr. Kannel, you may choose to be interviewed by Mary Hawkins. Access to the raw data from the completed surveys will be limited to the researcher, and his designee assisting with statistical analysis.

Right to decline to participate Your participation in this study is voluntary. You may choose not to participate without adverse consequences to you.

Note: Questions or concerns about participation in the research or subsequent complaints should be addressed first to the researcher, and second to the Human Subjects Administrator, UW-Stout Institutional Review Board for the Protection of Human Subjects in Research, 11 Harvey Hall, Menomonie, WI, 54751, phone (715) 232-1126.

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**I attest that I have read and understood the above description, including potential risks, benefits, and my rights as a participant, and that all of my questions about the study have been answered to my satisfaction.**

\_\_\_\_\_ **I hereby give my informed consent to participate in this research study.**

-OR-

(check one, sign and date)

\_\_\_\_\_ **I decline to participate in this research study.**

*Signature* \_\_\_\_\_ *Date* \_\_\_\_\_