

A COMPARISON OF THE EDUCATIONAL SUPPORTS NEEDED AND PROVIDED FOR
UNDERGRADUATE AND GRADUATE STUDENTS WITH LEARNING DISABILITIES IN
HIGHER EDUCATION

By

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To my mommy and daddy
for their love, encouragement, and support

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DEFINITION OF TERMS

ACADEMIC DEMANDS	the workload of academic tasks required at institutions of higher education in pursuing degree-seeking programs.
EDUCATIONAL SUPPORTS	varying types of accommodations for coursework and program requirements.
INSTRUCTIONAL SUPPORTS	provides access and delivery of information within the context of the classroom setting.
EXAMINATION SUPPORTS	provides retrieval of information within the context of the classroom setting.
ADMINISTRATIVE SUPPORTS	provides access to postsecondary education and employment after graduation within the context of the institution.
GRADUATE PROGRAMS	enrollment in masters, specialist, and doctoral studies including academic research degree programs.
PROFESSIONAL PROGRAMS	enrollment in undergraduate and graduate first terminal degree programs in which the student is able to practice the profession without limitation and excludes academic research preparation (e.g., law, engineering, and medicine).
STUDENTS WITH LEARNING DISABILITIES	undergraduate and graduate students enrolled in part-time or full-time coursework who are registered with the office of disability services at an institution of higher education with a diagnosis of learning disabilities.
LEARNING SPECIALIST	an individual who assists students with disabilities in registering with the office of disability services, requesting accommodations and offers remediation or tutoring services.

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Disability laws such as the American with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973 mandate equal access to academic programs, activities, and services for students with disabilities. Therefore, disability laws require that institutions of higher education offer students with learning disabilities (LD) various types of educational supports to help them compete alongside their non-disabled peers. As a result, the purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences in the educational supports needed and supports provided for completion of coursework and program requirements. Bronfenbrenner's ecological systems theory served as the theoretical framework for this study.

An online survey was used to gather data about the educational supports that undergraduate and graduate students with LD perceived as needed and are being provided at institutions of higher education. The types of educational supports assessed were as follows: (a) instructional, (b) examination, and (c) administrative. Participants included 293 students with LD enrolled with the office of disability services at nine, large-population, public institutions located

across the United States. The online survey was electronically mailed to students with LD by the office of disability services at each university.

The results of the correlation analysis revealed that there are significant weak, moderate, and strong positive relationships between supports needed by and provided for undergraduate and graduate students with LD. A series of *t*-tests revealed that graduate students perceived a greater need for varying types of educational supports compared to undergraduate students. These differences indicated that the academic, social, and emotional demands of graduate programs exceeded those of undergraduate programs and, therefore, it is necessary for graduate students to receive a wider range of educational supports to benefit learning. Additionally, a series of Chi-square tests revealed discrepancies between what supports students requested and what supports institutions provided. Therefore, graduate students perceived a greater need for educational supports; however they had the same probability of being provided with such supports compared to undergraduate students.

Furthermore, a series of Two-Way Analysis of Variance (ANOVA) indicated differences by institutions with the types of educational supports perceived as needed by and provided for undergraduate and graduate with LD. These findings demonstrated that students with LD are a heterogeneous group and, therefore, have individual learning profiles. As a result, it is suggested that students with LD become knowledgeable about their strengths and weaknesses as well as the educational supports offered in order to make informed decisions about which postsecondary educational institution to attend.

Finally, open-ended questions consisting of students' written responses revealed that undergraduate and graduate students perceived their need for instructional, examination, and administrative supports necessary to complete coursework and program requirements. Results

also indicated that cooperation among institutions, disability services, faculty, and students is necessary for providing educational supports that benefit students with LD.

CHAPTER 1 INTRODUCTION

Students with learning disabilities (LD) encounter a variety of academic difficulties as a result of their disabilities. Learning disabilities are defined as “a heterogeneous group of disorders manifested by significant difficulties in acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities” (National Joint Committee on Learning Disabilities [NJCLD], 1994, p. 65). For example, students with LD spend more hours reading textbooks, writing papers, and studying for exams compared to their non-disabled peers. Thus, students with LD must make extensive efforts to overcome their academic challenges (Heiman & Kariv, 2004; Ofiesh, Hughes, & Scott, 2004). Yet, because students with LD may have no visible disability such as a physical challenge, their needs may go unmet (Beilke & Yssel, 1999; Janiga & Costenbader, 2002). Although learning disabilities are considered “mild,” they can cause students to struggle to succeed academically, especially in higher education.

Since the passage of the American with Disabilities Act of 1990 (ADA), there has been an increase in the number of students with disabilities entering institutions of higher education. Currently, 9% of students attending institutions of higher education have some kind of disability (Henderson, 1999; Lewis, Farris, & Greene, 1999); students with LD constitute almost half (40%) of that 9% (Henderson, 2001). Additionally, of that 9% of students with disabilities, 26% drop out of school by the end of their freshmen year in college (Izzo, Hertzfeld, Simmons-Reed, & Aron, 2001). Researchers explain that students with LD are at risk for dropping out of college due to the stress of dealing with social, emotional, and academic demands, along with the challenge of learning to cope with their disabilities (Harris & Robertson, 2001).

Postsecondary Outcomes of Students with Learning Disabilities

Students with LD enroll in degree seeking programs for the same reasons as their non-disabled peers: to improve their education, employment opportunities, and quality of life (Mellard, 2005). Students with LD who complete undergraduate programs enter graduate programs at the same rate as their non-disabled peers. Additionally, students with LD who complete undergraduate programs, further their education through vocational and certification programs. Also, students with LD who graduate from degree programs become employed and earn salaries equivalent to those of their non-disabled peers (Horn & Berktold, 1999). Despite the educational and employment opportunities that higher education brings to students with LD, there are challenges they must overcome to succeed.

Adjusting to the Demands of Higher Education

As students transition into institutions of higher education, they experience a rigorous and competitive learning environment in pursuing their career goals. The demands of higher education gradually increase as students progress in academic programs (Larson, 2006; Smith, English, & Vasek, 2002). Whether students are transitioning into undergraduate or graduate degree programs, they experience social, emotional, and academic demands (Gerdes & Mallinckrodt, 1994). The transition into higher education for students with LD includes a scope of demands; they may develop feelings of disconnect from family and friends that lead to loneliness, isolation, and emotional stress (Hadjiioannou, Shelton, Fu, & Dhanarattigannon, 2007; Mellard, 2005; Middleton, 2001; Miller & Irby, 1999; Nyquist, et al., 1999; Skinner & Lindstrom, 2003; Smith, English, & Vasek, 2002; Wang, 2003). Also, students may encounter increased levels of stress and anxiety due to the academic demands and pressure of engaging in social events (Carrol & Lles, 2006; Heiman & Dafna, 2004). In fact, students may struggle with a full course load of reading, writing, and studying that requires learning larger amounts of

material in shorter periods of time (Brinckerhoff, 1996; Janiga & Constanbader, 2002; Miller & Irby, 1999). As a result, students are responsible for learning how to manage the responsibilities of independent living, school work, and leisure activities.

Students of all abilities who develop strategies to cope with the demands of higher education are more likely to experience successful learning outcomes. Generally, higher education is challenging for students who enter institutions with proficient academic skills and learning strategies (Hadjoannou, et al., 2007; Nielsen & Rocco 2002). Consequently, for students with LD the academic challenges are greater, especially if they have not developed compensatory strategies. These students will need specialized services tailored to meet their individual needs (Brinckerhoff, 1996; Hadley, 2007; Heiman & Kariv, 2004; Skinner & Lindstrom, 2003). Therefore, students with LD are responsible for developing strategies to work within the confines of their own disabilities; they must also seek their own academic and educational support services (Babbitt & White, 2002; Hadley, 2007). As a result, educational supports are necessary for students with LD to prevent failure and assure success in the academic setting of higher education.

Educational Supports in Higher Education

Disability laws mandate institutions of higher education to provide educational supports to students with disabilities (ADA, 1990; Section 504, 1973). Although disability laws are essential to assure that educational supports are implemented, institutions, faculty, and students respond differently to legislation. For example, two-year and four-year institutions differ in the types of educational supports they offer to students with disabilities (Bursuck, Rose, Cowen, & Yahaya, 1989; Hicks-Coolick & Kurtz, 1996; Nelson & Lignugaris-Kraft, 1989; Sharpe & Johnson, 2001). Additionally, faculty members who agreed that educational supports helped students with LD compete alongside their non-disabled peers were reluctant to implement

accommodations they perceived would compromise the integrity of degree programs (Murray, Wren, & Keys, 2008; Nelson, Dodd, & Smith, 1990; Vogel, Leyser, Wyland, & Brulle, 1999).

Nonetheless, students with disabilities believe it is their right to receive educational supports and express discontent when disability services and faculty fail to provide them (Beilke & Yssel, 1999; Dowrick, Anderson, Heyer, & Acosta, 2005; Elacqua, Kruse, & Rapaport, 1996; Houck, Asselin, Troutman, & Arrington, 1992; Sharpe, Johnson, Izzo, & Murray, 2005). As a result, there are some discrepancies between the educational supports being provided by institutions of higher learning and the perceived needs of students with LD.

Similarly, educational supports offered across institutions and within classroom settings fail to reflect the range of educational supports necessary for students with disabilities. Institutions of higher education are more likely to offer instructional and examination supports than administrative supports (Sharpe & Johnson, 2001; Stodden, Whelley, Chuan, & Harding, 2001; Sweeney, 2002; Tagayuna, Stodden, Chuan, Zelesnik, & Whelley, 2005). In essence, institutions provide educational supports that are the least expensive, most available, and most easily accessible (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999). Although most faculty members support the idea of fairness in providing course-related teaching and examination supports for students with LD, they also report a lower degree of willingness to implement such supports. In other words, faculty is willing to offer educational supports that require the least amount of time and effort (Vogel, et al., 1999). This is illustrative of what is known as the “minimalist approach” in offering educational supports for students with disabilities (Tagayuna, et al., 2005, p. 19).

Nonetheless, effective practices offering a range of educational supports to benefit students with LD can be implemented with the collaboration of administrators, disability

services, faculty, and students (Bourke, Strehorn, and Silver, 2000; Elacqua, et al. 1996; Houck, et al., 1992; Murray, Wren, & Keys, 2008; Vogel, et al., 1999). Administrators can help by making instructional, examination, and administrative supports available for students with disabilities. Also, department chairs can support faculty in preparing instructional and examination supports for students with disabilities (Bourke, Strehorn, & Silver; Murray, Wren, & Keys, 2008). Furthermore, disability services can increase awareness of the necessity of educational supports for students with disabilities. Thus, disability services can disseminate information regarding educational support services to all members of the higher education community (Dowrick, et al., 2005; Elacqua, et al.; 1996 Houck, et al., 1992). In this way, a range of educational supports can be offered to help students with LD achieve successful learning outcomes.

The Need for Educational Supports in Higher Education

As mentioned previously, academic demands are especially difficult for students with LD at institutions of higher education (Brinckerhoff, 1996; Hadley, 2007; Heiman & Kariv, 2004; Skinner & Lindstrom, 2003). The academic skills students with LD find challenging are the very same skills that are valued at institutions of higher education (Babbitt & White, 2002; Beilke & Yssel, 1999). Institutions of higher education are competitive learning environments that demand academic rigor. Coursework increases in complexity as students' progress through academic programs and larger amounts of material are covered in shorter periods of time putting greater demands on students with LD (Brinckerhoff, 1996; Brinckerhoff, Shaw, & McGuire, 1992; Janiga & Constanbader, 2002; Larson, 2006; Miller & Irby, 1999; Smith, English, & Vasek, 2002). Under these circumstances, compensatory strategies that may have been helpful in the past for students with LD are often insufficient (Skinner & Lindstrom, 2003). As a result,

students with LD need educational supports to enhance their opportunities to learn and compete in scholarly environments alongside their non-disabled peers.

Generally, offices of disability services determine the types of educational supports that students with LD are provided in the classroom. Although offices of disability services are the primary sources for providing support for students with LD, researchers note that educational supports offered by other sources can also help students compensate for their academic difficulties (Canto, Proctor, & Prevatt, 2005; Harris & Robertson, 2001; Madaus, 2005). For example, academic development centers can assist students with LD to overcome challenges in higher education by helping them develop the skills necessary for meeting academic standards (Hadley, 2007; Mellard, 2005). As a result, academic development centers can be equally valuable in helping students improve learning outcomes.

Academic development centers may offer many types of educational supports that are beneficial for students with LD. Academic services, such as reading, writing, and math centers can help students improve their respective skills related to various disciplines and also offer organization and time management skill trainings (Hadley, 2006; Harris & Robertson, 2001). For instance, a writing center may help students proofread their written assignments (Hadley, 2007). Similarly, students with LD may benefit from prescribed tutoring services that allow them to receive specialized instruction from learning disability specialists (Harris & Robertson; Mellard, 2005). Academic development centers can also help students learn how to manage the responsibilities of schoolwork, employment, and leisure activities by helping them develop a structured schedule (Cowen, 1988). Students with LD who develop structured schedules and acquire time management skills also gain confidence to manage their independence and freedom.

These skills create a more rewarding college experience for students with LD (Dalke & Schmitt, 1987).

In conclusion, there are several reasons educational supports are necessary for students with LD in higher education. Educational supports can help students with LD by minimizing their weaknesses and maximizing their strengths thus, providing students with LD equal opportunities to demonstrate their academic gifts and talents (Canto, Proctor, & Prevatt, 2005; (Harris & Robertson, 2001). Also, educational supports allow students with LD to benefit from instruction, excel in areas of academic performance alongside their non-disabled peers, and compensate for the academic demands placed on them in higher education (Hadley, 2007; Li & Hamel, 2003; Scott, 1994). As a result, educational supports provide students with LD opportunities to achieve a successful and rewarding postsecondary education.

Theoretical Framework

The theoretical framework for this investigation is influenced by the work of Bronfenbrenner (1979) (Figure 1-1). Bronfenbrenner's ecological systems theory focuses on the development of the adult learner within the context of his environment. For the purpose of this study Bronfenbrenner's model will be used to specify the four ecological systems as follows: (a) the microsystem includes the immediate environment such as faculty members and peer supports; (b) the mesosystem comprises of interconnections made between the immediate environments such as the learning specialist and faculty member; (d) the exosystem consists of environmental factors that indirectly affect student learning such as the types of educational supports offered and availability of support staff; and (d) the macrosystem identifies the cultural values, customs, and laws that impact learning. Bronfenbrenner explains that the interaction among these systems influences the development of adult learners (Sontag, 1996).

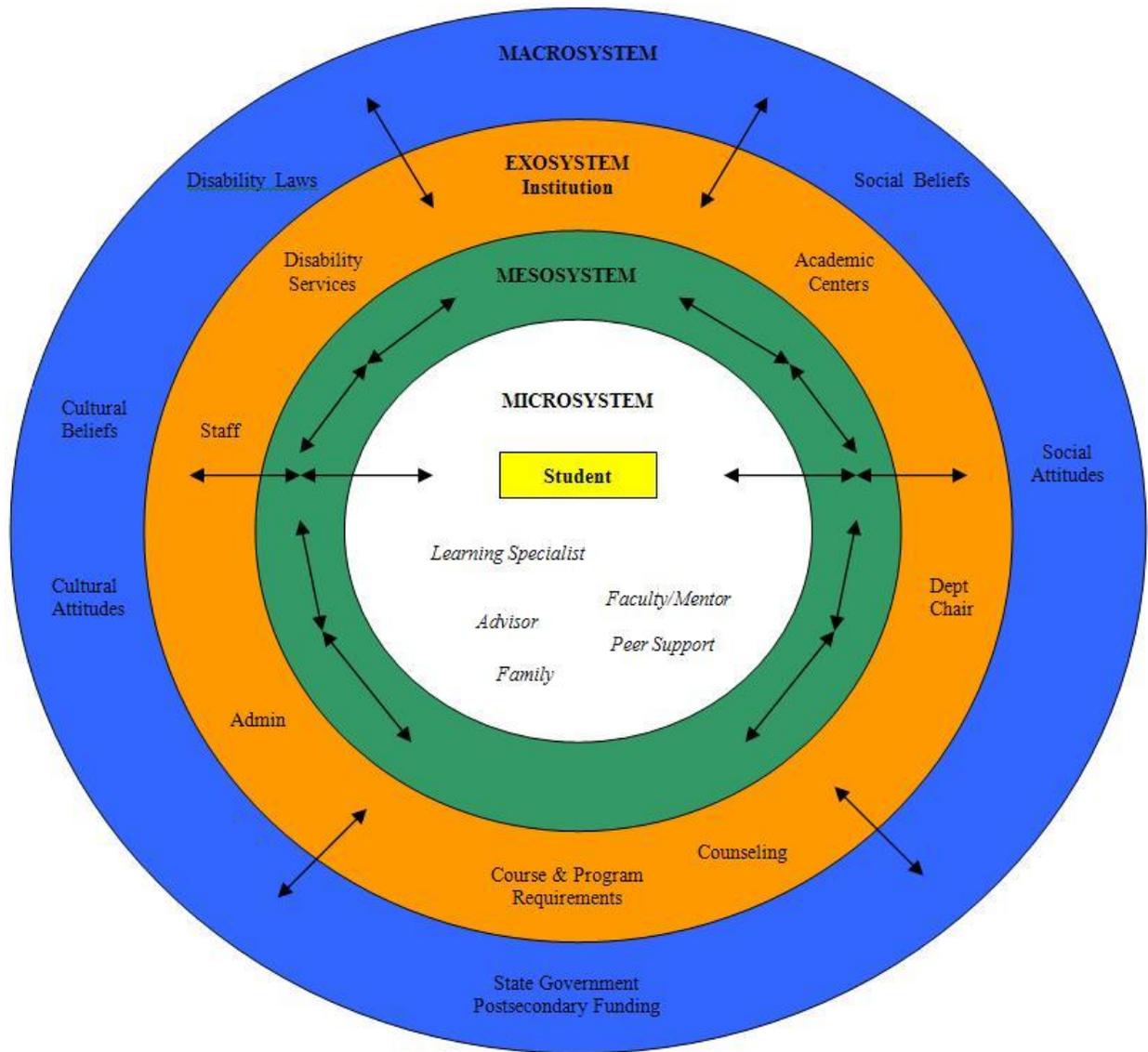


Figure 1-1. Educational supports model

Bronfenbrenner’s (1979) ecological systems theory is adapted to fit the educational supports model presented in this study. Adaptation of the ecological systems theory includes replacing the term “settings” with “members” at the microsystem and mesosystem stages. Whereas Bronfenbrenner describes how interactions occur “among and between settings,” I explain that interactions occur “among and between members.” However, only at the exosystem stage can interactions occur “between settings-members.” Bronfenbrenner also uses the term

“between settings” for each level of the ecosystem, explaining that the term refers to environmental influences that affect student development. Similarly, I use the terms “settings” and “members” interchangeably to refer to environmental influences that affect the implementation of educational supports that help students with disabilities improve learning outcomes. An explanation of Bronfenbrenner’s ecological systems theory as it applies to the educational supports model is presented as follows:

Microsystem

The innermost level is the microsystem in which the student exists. At the core of the system (white), the student interacts with members of the immediate environment (Bronfenbrenner, 1979; Sontag, 1996). In the context of higher education, the student must self-identify to the learning specialist at disability services to request educational supports (Simon, 2001; Skinner & Lindstrom, 2003). Also, the student must provide a letter of accommodations from the learning specialist to faculty to receive instructional and examination supports (Harris & Robertson, 2001). Furthermore, non-disabled peers may help students with access to certain types of instructional supports. For example, non-disabled peers may offer to become note takers during class lectures (Hughes & Suritsky, 1993). Therefore, students with disabilities interact with learning specialists, faculty, and peers in seeking educational supports. Additionally, advisors help guide students in selecting courses and degree programs based on their career interest as well as their academic strengths and weaknesses (Whelley, Radtke, Burgstahler, & Christ, 2003). Furthermore, although students in college may be living on their own, family members offer emotional support that can nurture student learning (Dalke & Schmitt, 1987; Foley, 2006; Mellard, 2005; Smith & Nelson, 1993). Thus, advisors and family members are an

integral part of the student's immediate environment in postsecondary education. As a result, the interaction between the student and the immediate environment is important for learning.

Mesosystem

The second level (green) is the mesosystem that is comprised of interconnections among two or more members in the immediate environment that influence learning (Bronfenbrenner, 1979; Sontag, 1996). The degree to which the members in the immediate environment interact with each other may vary depending on the individual needs of the student. This is true especially in postsecondary settings where the student is considered an adult learner. Although there may be no interaction between some of the members in the immediate environment, the relationship between some of these members are critical for student learning. For instance, learning specialists and faculty members who work together are able to offer educational supports that benefit student learning (Bourke, Strehorn, & Silver, 2000). Similarly, faculty who recruit support from non-disabled peers to help students with disabilities during class facilitate student learning (Shaw, Scott, & McGuire, 2001). However, at this level family members are less directly involved in communicating with faculty or learning specialists about adult learners (Graham-Smith, English, & Vasek, 2002). Yet, concerns of student academic progress may have family members contacting faculty or learning specialists to understand how they can help adult learners improve learning outcomes (Johnson, 2004; National On-Campus Report, 2005).

Exosystem

The third level (orange) is the exosystem that links the processes taking place between two or more settings that do not include the student but influence the members of the environment that work with the student. The events that occur between individuals at this level are out of the control of the student, but indirectly affect student learning (Bronfenbrenner, 1979;

Sontag, 1996). As a result, student learning may be positively or negatively influenced by the interactions between the individuals in these settings. For example, disability services may approve the copy of faculty lecture notes for students with LD (Vogel, et al., 1999). However, faculty's reluctance to provide lecture notes may hinder student learning (Nelson, Dodd, & Smith, 1990). Therefore, collaboration must occur between individuals in each setting in order to benefit students with LD (Sontag, 1996). Another example is when faculty refers students with LD to the writing center for help with writing skills. The extent to which the writing center provides trained staff that can help students with LD may either improve or limit students' writing abilities (Hadley, 2006). In this way, it can be seen that collaboration must take place between individuals in each academic support setting in order to positively affect student learning outcomes.

Macrosystem

The outermost level (blue) is the macrosystem that encompasses the micro-, meso-, and exosystems characteristic of a given culture, subculture, or broader social contexts. This macrosystem represents the social belief systems, availability of resources in the community, and governing laws that affect students with LD (Bronfenbrenner, 1979; Sontag, 1996). The culture of the macrosystem influences the settings and members within the other systems and ultimately affects the student with LD. For instance, disability laws such as the ADA (1990) and Section 504 of the Rehabilitation Act (1973) mandate equal access to academic programs, activities, and services for students with disabilities. These legal guidelines affect the types of academic, auxiliary aids, and non-academic activities offered at institutions of higher education. Additionally, socio-cultural beliefs and attitudes toward individuals with disabilities influences the extent to which students with disabilities are perceived as capable learners and accepted as

equal participants within the learning community (Groce, 1999). Furthermore, state government funding may contribute to the amount of educational resources available for students with LD at institutions of higher learning (Pacifci & McKinney, 1997). In these ways, the macrosystem influences the implementation of educational support services for students with disabilities in postsecondary settings.

In summary, when applied to this study, Bronfenbrenner's (1979) ecological systems theory provides a model that emphasizes the interactions between students with disabilities and their surrounding environments with respect to providing educational supports. First, the student is central to the effects of the immediate environment and an active learner by becoming a self-advocate in requesting educational supports. Second, environmental factors either facilitate or impede the process of providing educational supports to students with disabilities. Thus, the context of the environment influences whether or not a student adequately receives educational supports. The educational supports model illustrates how effective practices require collaboration among faculty, disability services, and students with disabilities as evidenced in the literature (Bourke, Strehorn, & Silver, 2000; Elacqua, et al. 1996; Vogel, et al., 1999). Finally, the macrosystem, or in this case the laws related to the education of students with disabilities, encompasses all these influences on the academic success of students with LD.

Purpose of the Study

When students with LD attend institutions of higher education, academic demands become increasingly more rigorous as they progress from undergraduate to graduate degree programs. Therefore, students with LD can become increasingly more dependent on various types of educational supports to complete coursework and program requirements. However, institutions of higher education may find it challenging to provide the necessary supports for several reasons. Unfortunately, there is no research that describes the types of educational

supports necessary for students with LD in higher education. Also, there is limited research on what educational supports students with LD perceive necessary for succeeding at institutions of higher education. Furthermore, research has not examined whether or not the need for educational supports varies between undergraduate and graduate students with LD. Hence, this study examined the following variables: (a) the types of educational supports needed, (b) the types of supports provided, and (c) the difference between those supports for undergraduate and graduate students with LD at institutions of higher education.

The purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences with respect to educational supports needed and provided for completion of coursework and program requirements. Chapter 2 provides a review of the literature on the types of educational supports related to institutions, faculty, and students with disabilities. Chapter 3 provides an explanation of the methods, procedures, and analysis of data implemented in this study. Chapter 4 provides the results of the study. Chapter 5 provides a discussion of the results and future recommendations for research and practice.

CHAPTER 2 LITERATURE REVIEW

As mentioned in Chapter 1, all students experience social, emotional, and academic demands at institutions of higher education when enrolled in undergraduate or graduate programs. These demands are particularly challenging for students with LD and can put them at risk for failure at institutions of higher education. As a result, students with LD need educational supports to help them meet the academic demands of institutions of higher education. Educational supports at institutions of higher education assist students with LD to complete coursework and program requirements.

In this literature review, I present an in-depth discussion about educational supports for students with disabilities in higher education. First, I examine the literature on disability laws, history of disability laws, disability case law, and self-identification and documentation in higher education. Second, I evaluate the literature on adjusting to the demands of higher education for undergraduate and graduate students. Third, I review three bodies of research to emphasize the types of educational supports offered to students with disabilities in higher education: (a) institutions, (b) faculty, and (c) students with disabilities. I will place an emphasis in evaluating the instructional and administrative supports provided to students with LD.

Disability Laws in Higher Education

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 (ADA) have lead institutions of higher education to be more responsive in serving students with disabilities. Section 504 applies to institutions that receive federal funding; ADA extends to all public and private institutions of higher education. Section 504 prohibits discriminatory practices against students with disabilities and serves as a proponent of equal access to postsecondary education. Federal legislation provides students with disabilities the opportunity

for equal access to all programs and services sponsored by institutions of higher education. As a result, institutions of higher education are required to provide educational support services to students with disabilities.

Under the statute of Section 504 an “otherwise qualified” student with a disability that is granted admission and meets eligibility criteria for completing a program may request educational support services (Simon, 2001, p. 4). Educational support services apply to ‘academic adjustments and reasonable modifications’ and the provision of ‘auxiliary aids and services’ (Grossman, 2001, p. 2). An academic adjustment includes testing modifications such as extended time on tests. Auxiliary aids and services include practices that provide access to information such as readers or note takers. These types of educational supports are commonly referred to as “reasonable accommodations” (Grossman, 2001, p. 2). Nonetheless, a student with a disability is entitled to accommodations as long they do not result in financial hardship to the institution and compromise the academic standards of the program.

History of Disability Laws

In the years prior to the passage of Section 504 some individuals with disabilities were institutionalized based on the misconception that their physical or mental disability prevented them from becoming employed and educated. In the early 1970’s the disability rights movement began when individuals with disabilities challenged societal barriers and prejudices that excluded them from their communities. The disability rights movement modeled itself after the civil rights movement by staging civil disobedience protests, hindering the movement of busses that were inaccessible to individuals with disabilities, marching in the streets against injustices, and organizing “sit-ins” in federal buildings. Many local agencies, private organizations, and parents of children with disabilities joined the movement of advocacy against segregation and exclusion of individuals with disabilities (Mayerson, 1992). The disability rights movement was further

strengthened by the independent living movement in 1972 that defied the notion that individuals with disabilities needed to be institutionalized. Disability activist Edward Roberts founded the independent living movement when his efforts to enroll for courses at the University of California at Berkeley spread into seeking access for all people with disabilities in the surrounding community (Shapiro, 1993). The disability rights movement further sought justice in the state and federal courts.

The disability rights movement brought legislative changes affecting public policy in the United States. In 1973 the passage of Section 504 by the U.S. Congress, consisted of non-discriminatory policies and practices and viewed people with disabilities as a protected class for the first time. Previously, public policy recognized the needs of individuals with disabilities separated by categories and based on their diagnosis. However, Section 504 recognized that although there is variation in different physical and mental disabilities, individuals with disabilities had been equally discriminated against, thus affecting their access to employment, education, and society. As a result, the U.S. Congress mandated civil rights protection for all individuals with disabilities (Mayerson, 1992).

In 1977 the regulations of Section 504 were issued and formed the basis of the ADA. The ADA became the first legal document to extend civil rights protection to individuals with disabilities. It also included non-discrimination in the private sector where there is little or no federal grant or contract monies. The main principle of ADA is that individuals with disabilities are capable of working and being members of their communities; therefore denying accommodations for individuals with disabilities is a violation of civil rights (Mayerson, 1992).

Disability Case Law in Higher Education

Section 504 and ADA require that institutions of higher education provide reasonable accommodations for students with disabilities, yet the laws avoid declaring the types of

educational supports that constitute such accommodations. As a result, institutions of higher education and students with LD have disagreed about the types of educational supports that are needed and offered. Since the passage of ADA, students with LD enrolled at institutions of higher education have disagreed about what is legally considered a reasonable accommodation. Several court cases have defined a reasonable accommodation under the statute of Section 504 and ADA for students with LD in higher education. In the case of *Guckenberger v. Boston University* (1997/1998) and *Pangburn v. Northern Kentucky University* (2000) the decisions affected how institutions are held accountable in providing students with LD reasonable accommodations regarding instructional and administrative practices.

In the case of *Guckenberger v. Boston University* (1997/1998) a group of students with LD contested the university's requirement that they complete foreign language classes in order to graduate. The students charged that the university's unwillingness to allow students with LD to substitute other classes for foreign language classes was a violation of state and federal discrimination laws. The United States Court for the District of Massachusetts evaluated whether or not the plaintiffs endured discrimination and whether or not course substitution is a reasonable accommodation. In *Guckenberger v. Boston University*, the court rejected the plaintiffs' argument that precluding course substitution violates discrimination law. However, the court held that the plaintiffs' "demonstrated that requesting a course substitution in foreign language for students with demonstrated language disabilities is a reasonable modification," (*Guckenberger v. Boston University*, p. 3). As a result of this court decision, it is the responsibility of institutions of higher learning to demonstrate if requested course substitutions fundamentally alter the integrity of their academic programs.

Similarly, in the case of *Pangburn v. Northern Kentucky University* (2000), the university withheld a student's education degree after failing to pass a required mathematics course. The student alleged that the institution's failure to reasonably accommodate her math learning disability was a violation of Section 504 and ADA. The United States Court of Appeals for the Sixth Circuit evaluated "whether Pangburn was provided reasonable accommodations that would make her 'otherwise qualified' under the statute" (*Pangburn v. Northern Kentucky University*, p. 2). In *Pangburn v. Northern Kentucky University*, the court affirmed that institutions were not required to lower or make substantial modifications of standards to accommodate students with disabilities. The court also found that the university had provided reasonable accommodation, given that the student received a personal tutor, extended-time on exams, a separate room for testing, a test proctor to read the exam, the opportunity to repeat the course, and the use of manipulatives to demonstrate mathematical concepts. Additionally, the student was offered but did not accept oral exam testing, additional testing to evaluate the student's math ability, a private tutorial course and substitution of an approved equivalent course at another institution.

The case of *Guckenberger v. Boston University* (1997/1998) delineated that reasonable accommodation may be determined through administrative practices. The case of *Pangburn v. Northern Kentucky University* (2000) affirmed the ruling of *Guckenberger v. Boston University* and defined instructional practices as reasonable accommodations. The decision of court cases involving instructional and administrative accommodations for students with LD in higher education has shed light on the types of educational supports that should be provided under Section 504 and ADA. The ongoing litigation in the courts has yet to prove what types of educational supports benefit student learning and result in successful fulfillment of coursework and program requirements. Nonetheless, the courts have addressed the issue that students with

LD must demonstrate that they have impairments in order to be considered as candidates for educational support services.

Self-Identification and Documentation in Higher Education

Institutions of higher education are not allowed to inquire about students' disabilities, thus students are responsible for disclosing if they have LD and providing adequate documentation in order to be considered eligible for educational support services. Institutions of higher education depend on accurate documentation to provide students with LD access to educational support services. The Association on Higher Education and Disability (AHEAD) provides guidelines for appropriate documentation and encourages institutions to follow these procedures when evaluating services for students with LD. The courts have relied on the professional judgment of AHEAD when defining what constitutes a disability (*Guckenberger v. Boston University*, 1997). An individual with a disability is a person who “has a physical or mental impairment that substantially limits one or more major life activities; or has a record of such impairment, or is regarded as having such impairment” (ADA, 1990, p. 5). The guiding principle for determining services needed is that a student's request for educational support is provided based on individual need and disability. For example, a student with a reading disability may be eligible for access to a reader, but may not be eligible for specialized math tutoring. Therefore, students with LD need to know the strengths and weaknesses related to their disabilities in order to self-advocate for the types of educational supports necessary for learning.

Adjusting to the Demands of Higher Education

Acknowledging the demands of higher education is important for understanding the various types of educational supports needed by students with LD. Whether or not students enter college immediately after high school or return to continue their education as graduate students, they become members of the learning community; as such they must adjust to the demands of

academia. Therefore, it is elementary to acknowledge the stages of transition that students experience as they progress from undergraduate to graduate programs. The following section includes: (a) a description of the transition from high school to college, (b) the transition from undergraduate to graduate programs; (c) the elements involved in adjusting to the demands of higher education in the context of undergraduate and graduate education; and (d) a brief discussion of the academic demands of higher education for students with LD in undergraduate and graduate programs.

The Undergraduate Experience: Transition from High School to Higher Education

High school students are expected to engage in coursework that prepares them for higher education. Thus, high school students planning on entering college tend to enroll in advanced curriculum courses, participate in extracurricular activities, and community service projects. During the high school years, students become comfortable with the routine of managing their required curricula and developing a sense of social belonging with their friends. Therefore, students entering higher education are expected to be able to cope with the demands of higher education (Skinner & Lindstrom, 2003; Smith, English, & Vasek, 2002). Yet, students entering higher education will encounter demands that are different from their experiences in high school (Larson, 2006). The transition from high school to higher education entails social, emotional, and academic demands that require adjustment to different educational settings.

Social demands

As high school graduates enter college they find themselves in a different social environment. Many high school graduates leave their family and friends and move away from home to attend institutions of higher education. Therefore, high school graduates have to disconnect from social groups and develop new networks of friends at institutions of higher education (Mellard, 2005; Skinner & Lindstrom, 2003; Smith, English, & Vasek, 2002).

Developing new friendships requires that students become involved in extracurricular activities such as sports, sororities, organizations, and campus activities (Boulter, 2002). Some students may also seek a part-time employment to pay for living expenses (Ramsay, et al., 1999). The social networks that students identify with allow them to integrate into the social community of institutions of higher education (Gerdes & Mallinckrodt, 1994).

Emotional demands

Students entering institutions of higher education also experience emotional demands. Students are responsible for developing emotional support systems, sometimes away from family members, and also as a way to make connections to faculty members (Dalke & Schmitt, 1987). Thus, students need to engage in dialog with faculty about academia and prospective career goals. For instance, students may communicate with faculty through electronic mail, during office hours visits, or while doing research projects (Boulter, 2002). Students foster relationships with faculty to create opportunities for having mentors and role models that motivate their learning (Cohorn & Giulliano, 1999). In this way, faculty members serve as authority role models similar to those of high school teachers and parents. This can help students establish a secure environment where learning helps them develop their career interests. Student fortunate enough to be in collegial relationships with faculty members can receive guidance and emotional supports which will help them adjust to the demands of higher education (Gerdes & Mallinckrodt, 1994; Pascarella, 1980).

Academic demands

As high school students enter higher education they experience a more competitive learning environment. The academic environment, for some students, can change from a small, structured environment to a large, unstructured setting. Therefore, students must learn how to

manage their time in order to accomplish coursework requirements (Brinckerhoff, McGuire, & Shaw, 2001; Dalke & Schmitt, 1987; Skinner & Lindstrom, 2003; Smith, English, & Vasek, 2002). In high school, students are generally, required to attend classes five days a week; six hours a day, with assigned homework that could take two hours an evening to complete (Brinckerhoff, 1996; Dalke & Schmitt, 1987). However, in higher education, students are generally required to attend classes 15 hours a week. Additionally, they may need to spend three or four hours, daily, studying, reading, and writing papers. Whereas, in high school students' grades are mainly based on effort for completing class assignments, in higher education grades reflect content knowledge based on exams (Brinckerhoff, 1996). For example, a typical class in higher education consists of listening to class lectures with students graded on a mid-term and final exam with a possible written research assignment. Thus, there can be infrequent evaluations and semester-long projects. Accordingly, in higher education the number of assignments may be less than high school, but the amount of information to be retained and work involved in completing the assignments is greater (Janiga & Costenbader, 2002). As students proceed to higher education, the academic demands of coursework become increasingly rigorous (Larson, 2006; Smith, English, & Vasek, 2002).

High school students entering higher education must adjust to the demands of higher education if they are to be successful. Although coursework becomes increasingly more difficult as students progress through their undergraduate programs, adjusting to the demands of higher education during the first two years are critical for student retention and degree completion (Boulter, 2002). Adjusting to the demands of higher education will also vary depending on student goals. The academic adjustment to higher education is particularly necessary for students interested in graduate or professional degree programs. Consequently, students who enter

graduate school have additional adjustments to make to meet the demands of advanced degree programs.

The Graduate Experience: Transition from Undergraduate to Graduate School

The challenges faced by students entering graduate and professional degree programs are similar to those of high school students transitioning to undergraduate degree programs in higher education. Consequently, graduate students encounter social, emotional, and academic demands similar to undergraduate students; however, they are more intense and rigorous. As undergraduate students enter graduate school presumably they have already experienced the transition process from high school to undergraduate programs. Graduate students have had previous experience with adjusting to the demands of higher education as evidenced by their prior academic achievements. As a result, institutions of higher education set higher expectations for graduate students in coursework and program requirements. This is one way that the demands of graduate school are more intense than undergraduate studies. Regardless of a student's prior academic achievement in higher education, the transition of entering graduate school requires adjusting to the demands involved in advanced degree programs.

Social demands

The social demands that students experience when entering graduate and professional degree programs differ from undergraduate programs. For example, because graduate students enter later in life, they experience a greater amount of responsibility to their families, work, and financial obligations. Graduate students are more likely than undergraduates to have families of their own, to be caring for children, and to be financially responsible for their families (Middleton, 2001). Whether or not graduate students are single, married, or divorced, with or without children, they are more likely to have family and financial commitments than undergraduates (Austin, 2002). As a result, students in graduate programs may have to balance

time spent with families while negotiating time spent on job responsibilities and completing coursework requirements (Miller & Irby 1999; Ramsay, et al., 1999). The social demands that graduate students encounter in their personal lives may be greater than the social support received from their peers. As a result, graduate students are left with less time to develop social support among their friends that are enrolled in similar graduate and professional degree programs (Ramsay, et al., 1999).

Emotional demands

In addition to social demands, graduate students also experience emotional demands that are unnoticed by family, faculty, and peers. Despite the emotional support that families may provide for graduate students, they are unable to completely understand the experiences of the graduate student unless they have also pursued a graduate degree. Therefore, graduate students seldom speak to their families about the challenges of graduate work (Miller & Irby, 1999). Also, although some graduate programs require committee members to guide students through coursework and program requirements, graduate studies require that, for the most part, students work independently. Thus, emotional disconnect also occurs in faculty-graduate student relationships (Austin, 2002; Lovitts, 2001; Nyquist, et al., 1999). Furthermore, graduate programs are highly competitive environments resulting in a lack of emotional support among peers. As a result, graduate students may need to overcome feelings of loneliness, isolation and emotional stress (Hadjioannou et al., 2007; Middleton, 2001; Nyquist, et al., 1999; Wang, 2003).

Academic demands

The academic demands of graduate school are challenging for students as coursework and program requirements differ from undergraduate programs. Although graduate students begin attending classes nine to twelve hours a week, they gradually move toward independent

coursework. Therefore, coursework begins in a structured learning environment shared with peers and ends with an unstructured and individualized setting that requires self-discipline and motivation. For example, assigned readings are shared during class discussions among peers, yet a research thesis or dissertation is an independent assignment focused on the student's area of interest (Middleton, 2001). Accordingly, as students proceed in their graduate studies, they become engrossed in a specific area of preparation that demands greater intellectual autonomy.

Also, larger amounts of reading and writing characterize graduate programs (Miller & Irby, 1999). Graduate students are required to analyze and synthesize information to produce scholarly written work. In this way, graduate students are expected to develop academic writing skills (Hadjioannou, et al., 2007; Nielsen & Rocco, 2002). Additionally, as graduate assistants (GAs), graduate students may be required to teach undergraduate courses with the responsibilities of developing class lectures, grading papers, and advising students (Austin, 2002; Hadjioannou, et al., 2007). Furthermore, graduate students may be involved in research projects with faculty members requiring an extensive amount of preparation and time to attend scheduled meetings. Students may also be preparing to conduct research projects of their own with minimal guidance from faculty (Nyquist, et al., 1999). At the same time, students are expected to maintain high academic standards and work independently on any given task. As a result, the academic demands of graduate programs substantially exceed the rigor of undergraduate studies (Wang, 2003).

In summary, as students enter undergraduate and graduate degree programs, they need to adjust to the demands of higher education. The transition from high school to higher education and undergraduate to graduate school are considered stages of learning that require a continuous adjustment to the demands of academic life (Lapsley, Rice, & FitzGerald, 1990). The elements

involved in adjusting to the demands of higher education remain the same throughout the learning process. The elements involved in adjusting to higher education include social, emotional, and academic demands (Gerdes & Mallinckrodt, 1994). Although each of these elements is an integral part in adjusting to the demands of higher education, academic demands are emphasized because students with LD need various types of educational supports to help meet coursework and program requirements at institutions of higher education (Hadley, 2007). Figure 2-1 illustrates the elements related to adjusting to the demands of higher education as a continuous cycle evident in undergraduate and graduate programs. This figure illustrates that social, emotional, and academic demands are linked together, thus affecting the academic performance of students at institutions of higher education.

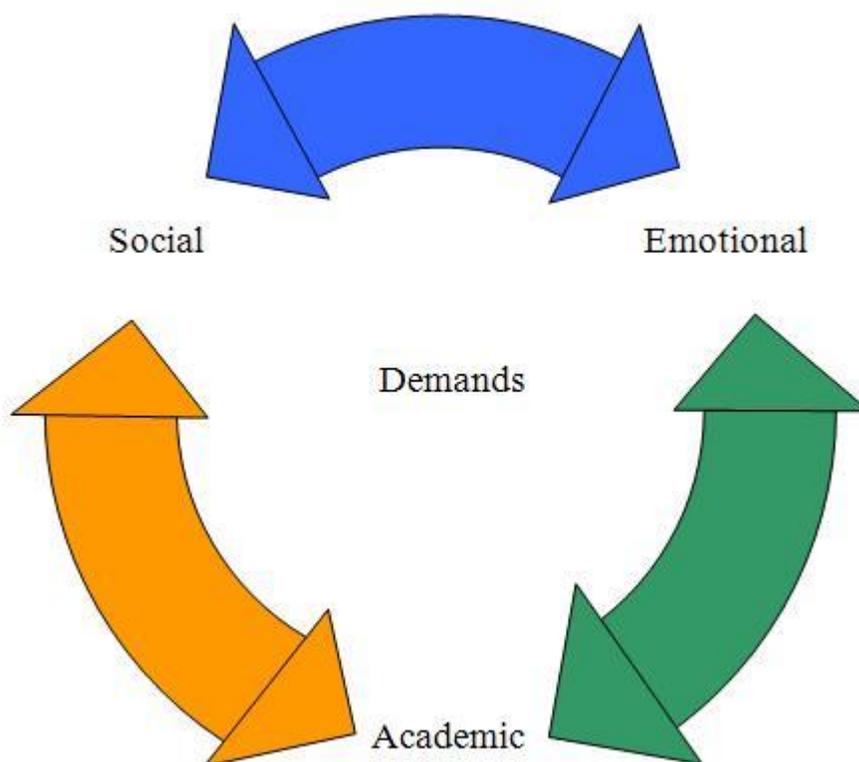


Figure 2-1. Adjusting to the demands of higher education

Undergraduate and Graduate Students with Learning Disabilities: The Academic Demands in Higher Education

The transition to higher education for students with LD is challenging given that academic demands gradually increase as students progress through undergraduate and graduate degree programs. Thus, there is a need to address the problems that undergraduate and graduate students with LD face related to academic demands since they are linked to academic achievement (Heiman & Kariv, 2004). In fact, whether or not students with LD decide to stay or leave institutions of higher education is influenced by their academic achievement (Gerdes & Mallinckrodt, 1994). As a result, issues of adjusting to the academic demands of higher education for students with LD are important due to their history of academic difficulties (Heiman & Kariv, 2004; Saracoglu, Minden & Wilchesky, 1989).

Undergraduate students

Students with LD entering undergraduate programs find the academic demands of higher education challenging for several reasons. The adjustment to the academic demands of higher education is difficult because students with LD are used to working closely with special education teachers or resource teachers in small settings in high school where they are provided with various types of educational supports (Brinckerhoff, 1996). The types of educational supports they received in high school alongside their non-disabled peers, such as resource rooms, learning specialists, and tutoring services, are no longer offered in the same way at institutions of higher education (Hadley, 2007). As a result, students with LD are expected to have developed compensatory learning strategies to help them adapt to the academic demands in higher education (Skinner & Lindstrom, 2003).

Additionally, the adjustment to the academic demands of higher education are challenging because of the difference in expectations between high school and college. Students

with LD in high school are graded on their academic progress. Students' grades are based on their academic skill level of functioning rather than high standards of academic performance compared to their non-disabled peers (Skinner & Lindstrom, 2003). Yet, as students with LD enter higher education, they compete alongside their non-disabled peers who are considered high ability students (Brinckerhoff, 1996; Dalke & Schmitt, 1987). Therefore, students with LD may need to work harder in higher education than in high school to achieve the same learning outcomes (Brinckerhoff, 1996). Due to the competitive learning environment of higher education, students with LD may need various types of educational supports to adjust to the academic demands of higher education (Smith, English, & Vasek, 2002). Hence, the use of various types of educational supports helps students with LD compensate for their challenges and compete alongside their non-disabled peers (Hadley, 2007; Heiman & Kariv, 2004).

Graduate students

Students with LD entering graduate education may find that their program of study is more advanced, rigorous, and challenging compared to their undergraduate education. Soon after entering graduate studies, students without learning disabilities feel that learning academic writing is an arduous process. Students must generate unique ideas, develop in-depth understandings of content knowledge, and write in scholarly language (Hadjioannou, et al., 2007; Nielsen & Rocco 2002). Similarly, students with LD may feel that their abilities and academic skills, particularly in academic writing, are not developed to the same level as their non-disabled peers (Li & Hamel, 2003). Despite a history of successful learning outcomes, students with LD entering graduate education may also judge themselves harder. Consequently, students with LD may feel they need to devote more time to their studies in order to succeed alongside their non-disabled peers (Heiman & Kariv, 2004; Lackaye, et al., 2006).

Although highly successful undergraduate students with LD are known to develop compensatory strategies, their coping mechanisms begin to break down as the academic demands become increasingly more rigorous. For example, graduate programs involve a greater number of tasks; assignments are larger and more complex (Skinner & Lindstrom, 2003). Also, graduate work differs from undergraduate work because class discussions replace class lectures. Thus, learning relies heavily on the students' ability to read complex assignments and formulate answers to questions of their own instead of responding to a teacher's question (Hadjioannou, et al., 2007). Therefore, knowledge is crafted by the student through guidance and support of the professor and advisor rather than imparted to the student (Austin 2002). As a result, the need for various types of educational supports may become more necessary for students with LD in graduate degree programs.

Educational Supports in Higher Education

Disability laws mandate that institutions, faculty, and students with disabilities abide by guidelines for providing and requesting various types of educational supports. First, institutions of higher education are required to provide educational supports to students with disabilities. Second, faculty members must comply in providing educational supports to students with disabilities. Finally, students with disabilities are responsible for requesting educational support services necessary for learning. As a result, the implementation of educational supports depends on collaboration among institutions, faculty, and students with disabilities. A range of educational supports may be implemented at institutions of higher education to include instructional, examination, and administrative practices. The purpose of educational support services is to help students with disabilities complete coursework and program requirements. Therefore, research studies on institutions, faculty and students with disabilities are examined to gain a better understanding of how educational supports are viewed from different perspectives.

The purpose of this literature review is to evaluate (a) the types of educational support offered at institutions of higher education, (b) faculty attitudes toward educational supports, and (c) student perceptions of the postsecondary climate regarding educational supports.

In each of the following sections (a) the most common and least common types of educational supports offered to students with disabilities are listed; (b) a discussion on how institutions differ in providing various types of educational supports for students with disabilities; (c) faculty's beliefs and understanding of educational supports are evaluated to determine how they influence their practices; and (d) an explanation of how students with disabilities perceive faculty and disability services' willingness to help them access educational supports. Figure 2-2 provides a hierarchical model of how educational supports are provided to students with disabilities to help enhance their learning outcomes. As illustrated in the model, educational supports are passed from the institution to the student or from the institution, to the faculty, and then to the student, indicating a non-collaborative process.

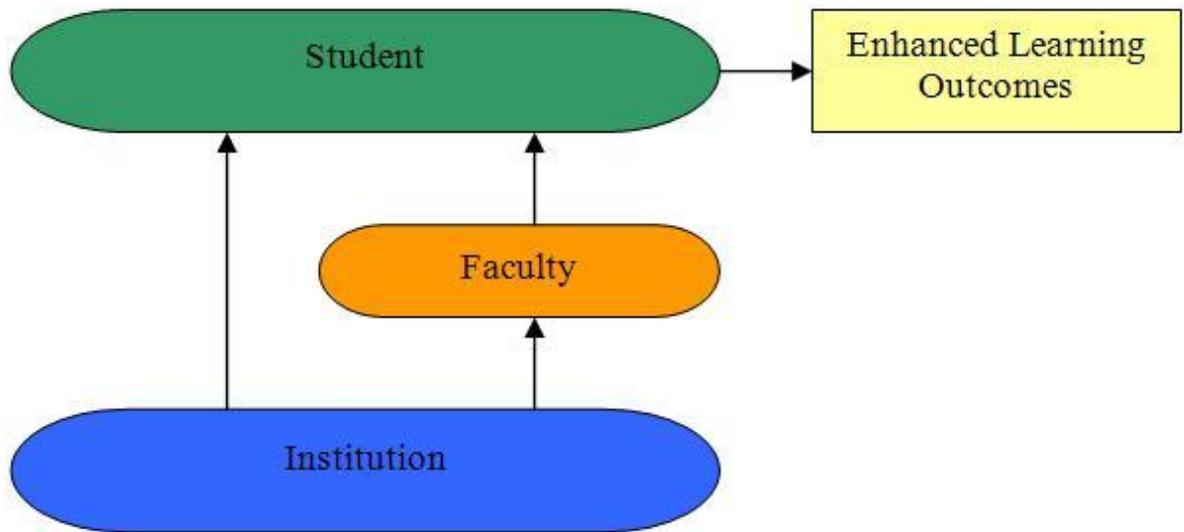


Figure 2-2. Educational supports: A non-collaborative approach among institutions, faculty, and students

A review of the literature consisted of searches of ERIC, Psychology and Behavioral Sciences Collection, PsycINFO, Academic Search Premier, Expanded Academic ASAP, and Lexis-Nexis databases using several combinations of the following terms: higher education, post-secondary education, educational supports, accommodations, students with disabilities, and students with LD. Then a search of the following journals was conducted from 1989 to the present: *College Student Journal*, *Journal of Vocational Rehabilitation*, and *Exceptional Children*. These searches produced 17 articles addressing the types of educational supports offered to students with disabilities in higher education. The following criteria were used for inclusion of articles in this review: (a) instructional and (b) administrative supports. Research studies were also selected in accordance with the passage of the ADA in 1990 which gave renewed attention to Section 504, offering equal access to students with disabilities at institutions of higher education. Additionally, the reference list of each study was reviewed for further studies relevant to educational supports. Tables summarizing each study are presented in each section.

A comprehensive review of the literature was done to explore the educational supports offered at institutions, implemented by faculty, and found to be beneficial for students with disabilities. Research studies were evaluated for various types of educational supports from the perspective of institutions, faculty, and students. The following procedures were used to identify various types of educational supports: (a) a list identifying educational supports was developed; (b) the list of educational supports was analyzed to create themes; (c) each theme related to educational supports was color-coded; and (d) the designated themes related to educational supports were organized by categories to include instructional, examination, and administrative supports.

Educational Supports for Students with Disabilities at Institutions of Higher Education

The passage of the ADA in 1990 gave renewed attention to Section 504 of the Rehabilitation Act of 1973, thus offering students with disabilities equal access to institutions of higher education. Section 504 provides guidelines for institutions of higher education specifically related to providing educational supports to students with disabilities. In fact, Section 504 specifically addressed an array of academic adjustments, auxiliary aids, and non-academic supports that institutions may offer to students with disabilities; consequently the types of educational supports offered to students with disabilities vary across institutions of higher education (Nelson & Lignugaris-Kraft, 1989; Simon, 2001).

Review of the Literature on Institutions

Institutions of higher education have been the foci of researchers who are interested in how educational supports are implemented to help students with disabilities attain a postsecondary education. Researchers have found that institutions of higher education differ in the types of educational supports they offer to students with disabilities and such supports are influenced by how institutions of higher education are structured (Bursuck, et al., 1989; Hicks-Coolick & Kurtz, 1996; Nelson & Lignugaris-Kraft, 1989; Sharpe & Johnson, 2001). As a result, researchers have established that educational supports offered to students with disabilities vary across institutions of higher education (Sharpe & Johnson, 2001; Stodden, et al., 2001; Tagayuna, et al., 2005).

Bursuck, et al. (1989) identified the service goals and options for students with LD at institutions of higher education. These researchers evaluated the differences between the service provision goals attained for students and services actually provided (Bursuck, et al., 1989). The participants included 336 disability support coordinators (DSC) that were members of the Association on Handicapped Student Service Programs in Postsecondary Education (AHSSPPE).

The DSC's were employed at 81 two-year and 105 four-year institutions of higher education located in urban, suburban, and rural areas in the United States.

The questionnaire asked respondents to provide information about general characteristics of their institution such as (a) enrollment size, (b) degrees offered, and (c) admission requirements. Additionally they asked for three aspects of their services which they provided for students with LD to include admissions procedures for services (e.g., psychoeducational evaluation) and service goals (e.g., taped textbooks and basic skills instruction in areas of reading and math), and actual services provided. The questionnaire was organized into general categories and subsections based on a literature review of disability support practices frequently provided for students with LD at institutions of higher education. The questionnaire was mailed to all participants with a return rate of 58.6%, indicating 197 respondents. A series of quantitative methods (Chi-square, Kruskal Wallace, and ANOVA) were employed for data analyses.

Results of the study indicated that service goals were emphasized differently across institutions of higher education. Access to Section 504 was noted as most important to 54% of the respondents, while others favored compensatory learning strategies (34%), followed by basic skill remediation (13%) as least important. The service provisions offered by institutions of higher education did not differ according to their service goals. In accordance to service provisions, most institutions of higher education offered special services (academic advisement, career counseling, advocacy, and progress monitoring) and remedial services to include tutorial assistance by a learning disability or content specialist for reading, math, writing, and study skills instruction. Remediation services in oral language and social skills development were offered in fewer programs. Also, one-to-one instruction was more common than group instruction for

remediation. Nonetheless, service goal priority was reported to affect the extent to which provisional services are provided. Institutions that favored learning strategies and basic remediation skills provided more services for students with LD and were likely to employ learning specialist to deliver specialized instruction and provide advocacy.

Another important finding of this study was comparing institutional size and degrees granted to services provided. The size of the institution and types of degrees granted had no effect on the services rendered with respect to 504 provisions, but differed in providing special and remedial services. Smaller institutions were more likely to offer one-on-one and group tutoring as well as math remediation. Also, institutions granting associate degrees were more likely to provide remedial instruction and award course credit compared to institutions offering bachelor programs. The results of the study indicated that the services provided vary according to the size of the institution, degrees offered and the service goal priority.

Similarly, Sharpe and Johnson (2001) developed an operational framework to identify the parameters of institutional capacity with respect to services offered for students with disabilities. The goal was to address the nature, range, and effectiveness of educational support services. Capacity was defined as a service, program, support, or technology that was measurable by frequency of use or availability. Institutions of higher education were identified as either high capacity or low capacity based on the frequency of various types of educational supports offered to students with disabilities. Institutions in the upper 20th percentile were identified as high capacity institutions, while the lower 20th percentile institutions were noted as low capacity institutions. Study participants included 1,500 disability support coordinators (DSC) at institutions of higher education across the United States. Approximately 69% of surveys completed by DSC were employed at public institutions and 31% at private institutions. Also,

60% of DSC associated with 2-year institutions and 40% at 4-year institutions completed the survey.

A 5-point Likert-type scale survey, *National Survey of Postsecondary Education Supports for Students with Disabilities*, was distributed to 126 high capacity institutions and 133 low capacity institutions. The high capacity group consisted of 54 four-year public institutions and 52 two-year private institutions. The low capacity group consisted of 31 four-year public institutions and 35 two-year public institutions. In addition, the low capacity group included 59 four-year, and eight two-year private institutions. An overall return rate of approximately 45% was analyzed using ANOVA and Chi-square to demonstrate findings.

The results of this study revealed that public institutions have developed a greater capacity than private institutions. Therefore, students with disabilities were likely to find a wider range of educational supports available at larger, public institutions rather than smaller, private institutions. Findings of this study showed that the capacity of the institution affects the quantity and quality of educational supports offered. As a result, there was a wide discrepancy between high and low capacity institutions with regard to educational supports in areas such as assistive technology, evaluations, study skill strategies, note takers, readers, interpreters, transliterators, priority registration, course scheduling, and advocacy services.

Another finding from the study showed that low capacity institutions (small, private) were found to have lower student-to-staff ratios compared to high capacity institutions (large, public). Thus, high capacity institutions were found to have more full-time and part-time professionals and support staff available to provide services for students with disabilities. Although 24% of the low capacity institutions (small, private) were found to have no full- or

part-time staff to offer support to students with disabilities, approximately 8% were considered high capacity under the same staffing conditions.

Further research studies demonstrated that educational supports offered to students with disabilities vary across institutions of higher education. Hicks-Coolick and Kurtz (1996) reported the types of educational supports available to students with LD at various colleges, universities, and vocational schools in Georgia. The participants included nine counselors that worked closely with students with LD. The counselors were employed at one state college, two private colleges, two state universities, two community colleges, and two vocational schools.

A semi-structured interview with open-ended responses was used for data collection. Inductive content analysis was used to identify categories of responses and formulate themes, thus allowing an analysis of the raw data. Researchers also documented their observations, gathered pamphlets, and written information from each institution to support the data. Triangulation was conducted by comparing student observations, interview data, and archival data (handouts and pamphlets) to establish trustworthiness.

Results showed that small and large institutions and private and public institutions did not differ in the types of educational supports offered, yet differed in the magnitude in which support services were offered. The types of educational supports offered were (a) advising, (b) special testing, (c) tutoring, (d) note taking, (e) advocacy, (f) use of technology, and (g) special equipment. Nonetheless, the service delivery model for providing educational supports to students with LD differed across institutions. Disability support services were offered at six public institutions, whereas comprehensive programs were located in two private liberal arts colleges and the state research university. There was a distinction made between disability support services that were less structured and extensive than comprehensive programs. These

differences were evident in the limited number of support personnel employed; the more personnel, the more comprehensive the programs. The distinction between service delivery models showed that services vary greatly across institutions.

Continuing to investigate the nature and range of educational supports offered to students with disabilities at institutions of higher education, Stodden, et al. (2001) examined the area of technical support and assistive devices. Study participants included 1,500 disability support coordinators (DSC) at numerous institutions of higher education across the United States. The sample included 422 public and 193 private institutions comprised of 246 two-year and 369 four-year institutions. A second sample included an additional 30 institutions of higher education that historically have served non-White students: 15 African American universities and 15 Native American universities.

A 5-point Likert-type scale instrument was developed and pilot tested. The design of the survey was conducted by a national workgroup of researchers who were members of a consortium of four universities affiliated with the National Center for the Study of Postsecondary Educational Supports (NCSPEs). The survey assessed institutional capacity to offer educational supports and availability of technological assistance, outreach programs, funding and specialized staff. The survey additionally evaluated written policy regarding disability support provisions. A response rate of 43% was accounted for in analyzing the data using descriptive and frequency statistics.

Results of this study demonstrated that the most commonly offered practices were (a) test accommodations, (b) note takers, (c) personal counseling, and (d) advocacy assistance. Less commonly supports offered were (a) organization and time management skills assistance, (b) study skills programs, and (c) career related supports. The least commonly supports offered were

(a) real-time captioning, (b) assistive technology evaluation and supports, (c) provision of equipment software, (d) skills training on equipment software, (e) document conversion, (f) adaptive furniture, (g) disability-specific evaluations, (h) disability related scholarships, (i) supports for study abroad, (j) accessible transport on campus, and (k) transferring support to employment. Although students with disabilities often requested the use of assistive technology, these services were offered less frequently. Also, the educational supports offered focused more on advocacy for students, informational services, or remediation rather than self-advocacy or compensatory strategies. The results of the study showed variation in the level and types of educational supports offered across states and across campuses.

More recently, Tagayuna, et al. (2005) compared the nature and range of educational supports and services offered to students with disabilities during a two-year period. The participants included 1,500 disability support coordinators (DSC) from various institutions of higher education across the United States. The institutions chosen were affiliated with AHEAD and were both two- and four-year institutions. A second sample included universities that were regionally stratified by the National Center for Educational Statistics (NCES). A third sample included 30 historically minority institutions consisting of 15 African American and 15 Native American respectively. The total number of institutions of higher education that completed the survey was 418: 289 public and 129 private.

A Likert-type scale instrument was developed, piloted, and distributed to 20 DSC at two-year and four-year institutions in 1999 in the State of Hawaii. The survey was conducted by a national consortium of researchers from four universities affiliated with NCSPEs, located at the University of Hawaii. The members of the consortium were experts in disability services, educational supports, and survey development. The survey assessed institutional capacity to offer

educational supports and availability of technological assistance, outreach programs, funding and specialized staff, as well as written policy regarding disability support provisions. An analysis of variance (ANOVA) was conducted to compare the educational supports offered and determine whether there were significant differences between 1999 and 2001. A response rate of 41% in 1999 and 26% in 2001 were reported.

The results of this study revealed that in 1999 the most commonly offered supports included (a) test accommodations, (b) note takers, (c) personal counseling, (d) advocacy assistance, (e) career assessment, (f) job placement services, and (g) transferring supports to employment. The least commonly offered supports included (a) disability specific scholarships, (b) assistive technology evaluations, (c) real-time captioning, and (d) on-campus transport for students with disabilities. In 2001 the most commonly offered supports included (a) testing accommodations, (b) personal counseling, (c) note takers, (d) scribe, (e) readers, and (f) advocacy. Less commonly offered supports included (a) tutors, (b) interpreters, (c) learning center laboratory, and (d) career assessment. The least commonly offered supports included (a) summer orientation program, (b) assistive technology evaluations, (c) real-time captioning, (d) disability-specific assessment, and (e) facilitation of transfer to work setting. The results indicated there were increased offerings in generic support services (e.g., educational, instructional, and assistive technology) which are considered the least expensive, most available and easiest to provide. Administrative supports such as summer orientation programs, priority/course scheduling, disability specific scholarships, and transferring supports to employment remained the least offered; decreasing during the two-year study.

These studies revealed that the educational supports offered to students with disabilities vary across institutions of higher education. The types of educational supports vary according to

the size and capacity of the institution, degrees offered, and service goal priority. The types of educational supports differ in magnitude and are classified as most and least common practices. An overview of studies examining the types of educational supports offered to students with disabilities at institutions of higher education is presented in Table 2-1.

Table 2-1. Studies of the educational supports for students with disabilities at institutions of higher education

Study	Purpose	Participants	Setting	Instrument	Findings
Bursuck, W. D., Rose, E., Cowen, S., & Yahaya, M. A. (1989)	Identify postsecondary education service goals	336 Disability Service Coordinators	81 two-year colleges and 105 four-year colleges offering Bachelor Degrees	Questionnaire	Services provided vary according to the size of the institution, degrees offered and the service goal priority.
Hicks-Coolick, A., & Kurtz, D. P. (1996)	Explore magnitude of postsecondary services	9 Learning Disability Counselors in Postsecondary Education	State of Georgia: 1 State College 2 Private Colleges 2 State Universities 2 Community Colleges 2 Vocational Schools	Semi-structured Interviews, Observations, and Ethnographic Data	The magnitude of support services and type of service delivery model vary across institutions.
Sharpe, M. N., & Johnson, D. R. (2001)	Identify nature and range of educational supports	1,500 Disability Service Coordinators	592 Colleges: 69% Public 31% Private 60% two-year 40% four-year	National Center for the Study of Postsecondary Educational Supports Survey	The capacity of the institution affects the quantity and quality of educational supports offered.
Stodden, R. A., Welley, T., Chuan, C., & Harding, T. (2001)	Identify nature and range of educational supports	1,500 Disability Service Coordinators	422 Public colleges 193 Private colleges 246 two-year colleges 369 four-year colleges	National Center for the Study of Postsecondary Educational Supports Survey	The level and types of educational supports offered to students with disabilities at institutions of higher education vary across states and campuses.
Tagayuna, A., Stodden, R. A., Chuan, C., Zeleznik, M. E., Whelley, T. A. (2005)	Identify nature and range of educational supports	1,500 Disability Service Coordinators	289 Public colleges 129 Private colleges Two-year and four- year institutions	National Center for the Study of Postsecondary Educational Supports Survey	The most common supports offered by institutions are generic services that are considered the least expensive, most available and easily accessible instead of an array of services.

Summary of the Literature on Institutions

In addressing the types of educational supports provided to students with disabilities at institutions of higher education, five research studies were reviewed. Additionally, an academic journal article offering a short literature review by Nelson and Lignugaris-Kraft, (1989) was also evaluated for this study. Bursuck, Rose, Cowen, and Yahaya (1989), Hicks-Coolick and Kurtz (1996), Nelson and Lignugaris-Kraft (1989), and Sharpe and Johnson (2001) compare the types of educational supports provided to students with disabilities at both two-year and four-year institutions. Institutions of higher education differ in the types of educational support services offered to students with LD. The services provided for students differ according to size and type of institution, degrees offered, and mission statement of the college in serving students with LD. Similarly, Sharpe and Johnson (2001), Stodden, et al. (2001), and Tagayuna, et al. (2005) evaluated the most common and the least common types of educational supports offered at institutions of higher education. The types of educational supports offered ranged from the most commonly and the least commonly used practices, as well as instructional and administrative practices for addressing the needs of students with disabilities. A review of the literature on educational supports for students with disabilities at institutions of higher education is essential to gain a greater understanding of these issues in order to abide by the disability laws.

Comparison of institutions with types of educational supports provided

Research on small, private and large, public institutions show contradictory findings regarding the extent to which support services are offered (Hicks-Coolick & Kurtz, 1996; Sharpe & Johnson, 2001). In a study comparing two private and six public institutions, Hicks-Coolick and Kurtz (1996) found that private institutions limit the enrollment of students with LD in order to offer one-on-one support, however they may charge substantial fees for their services. Additionally, private institutions are more likely to offer comprehensive disability programs.

These comprehensive programs individualized to provide support to students with LD. Furthermore, private institutions are more likely to hire teachers with learning disability credentials and allocate a larger portion of funds for services to help students with LD. Conversely, public institutions staff only one or two credentialed professionals to assist students with LD, yet provide disability services at no cost (Hicks-Coolick & Kurtz). Hence, public institutions have larger enrollment rates; they provide a wider array of services than private institutions, however private institutions can offer higher quality services to students with LD (Sharpe & Johnson, 2001).

Similarly, two and four-year institutions differ in providing special and remedial services depending on the academic degrees being offered (Bursuck, et al., 1989; Nelson & Lignugaris-Kraft, 1989). For example, two-year institutions are more likely to provide remedial instruction as well as offer vocational training and certification programs (Bursuck, et al., 1989). Conversely, four-year colleges offering academic degrees may be less likely to offer special services for students with disabilities due to the rigorous nature of their programs. Therefore, remedial and support services offered can be a result of the expected entry-level skills of students and the view of the educational role of the institution. As a result, the mission of the institution may influence the types of services provided to students with LD (Nelson & Lignugaris-Kraft, 1989). Institutions whose priority is to conform to disability laws are less likely to monitor student progress and provide tutoring services. However, schools whose priority is development of compensatory strategies and basic remediation of skills emphasize hiring staff advocates and full-time credentialed staff for helping students with LD (Bursuck, et al.).

The most common and the least common types of educational supports offered

Several researchers have surveyed disability resource personnel to identify the most and least commonly offered types of educational supports for students with disabilities (Sharpe & Johnson, 2001; Stodden, et al., 2001; Tagayuna, et al., 2005). The most common types of instructional supports offered included (a) testing accommodations, (b) note takers, (c) scribe, (d) readers, (e) tutors, (f) interpreters, (g) transliterators, (h) learning center laboratory, and (i) career assessment. The most common types of administrative supports offered included (a) advocacy and personal counseling services, (b) priority registration, (c) course scheduling, and (d) class relocation. Conversely, the least common types of educational supports offered included (a) real-time captioning, (b) summer orientation program, (c) assistive technology and (d) disability-specific evaluations. Additionally, the least likely kinds of supports to be offered are disability-specific scholarships and transfer supports for post-graduate employment (Stodden, et al.2001; Tagayuna, et al., 2005). Based on this analysis, administrative supports are the least common types of educational supports to be offered to students with disabilities.

In conclusion, there are two main points to address on educational supports at institutions of higher education. First, students with disabilities may experience difficulty in accessing educational supports because of the variability and availability of these supports. Institutions of higher education that minimize academic assistance for students with disabilities are the least likely to provide remedial services and comprehensive programs. Moreover, institutions whose mission is solely to conform to disability laws without providing extended supports beyond disability services, compromise the academic success of students with disabilities. Thus, students with disabilities may experience academic difficulties as a result of the differences in educational support services offered at institutions of higher education. Second, students with disabilities are

responsible for making informed decisions about their needs for educational support services at institutions of higher education. Students with disabilities who may be unaware of how their disabilities impact their learning are unable to make informed choices about attending institutions that provide the educational supports they need to be successful. Also, students with disabilities who are diagnosed in college may need to rely on disability services to help them make informed decisions regarding the types of educational supports they need. Students who arrive at institutions of higher education fully informed about their LD are able to make more knowledgeable decisions about their needs and the institutions they attend.

Additionally, the most common types of educational support services being offered by institutions of higher education reflect instructional supports that are indicative of a minimalist approach. The most common types of educational supports offered to students with disabilities are the least expensive, most available, and easy to provide (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999). Even though many institutions are likely to offer common types of educational supports, there is a lack of scientific evidence to prove that these supports are linked to successful outcomes for students with disabilities. Additionally, when institutions offer the most common types of supports they disregard an array of other services that could be beneficial to students with disabilities (Stodden, et al., 2001; Tagayuna, et al., 2005).

Faculty Attitudes toward Educational Supports for Students with Learning Disabilities

Faculty members play many roles with respect to students with LD; the least of which is educator. In academic settings, faculty is responsible for determining course readings, writing assignments, and examinations that assess student knowledge of the curriculum. Also, faculty must acknowledge students' academic skills and career goals. Therefore, teaching courses requires faculty to be knowledgeable not only about academics, but also student development (Whelley, Radtke, Burgstahler, & Christ, 2003). However, when students with disabilities are

enrolled in university classes, faculty's responsibility to help students meet individual learning goals becomes much more complex. When teaching students with LD, faculty is required to provide the educational supports deemed necessary for learning. As a result, faculty who are knowledgeable of disability laws and educational supports can make informed and sensitive decisions regarding their teaching practices (Norton, 1997; Vogel, et al., 1999).

Review of the Literature on Faculty

Faculty members at institutions of higher education are an integral part of the learning community. Thus, faculty responsibility in teaching students with LD requires providing various types of educational supports. Researchers have noted both faculty level of willingness and reluctance to provide educational supports. The types of supports that faculty are willing but reluctant to provide range from instructional to examination supports (Nelson et al., 1997; Norton, 1997; Sweener, Kundert, May, & Quinn, 2002; Vogel, et al., 1999). Also, some researchers explain that faculty's comfort level in providing educational supports depends on their concern about maintaining academic standards and their prior experience teaching students with disabilities (Nelson, et al. 1997; Norton, 1997; Vogel, et al., 1999).

Nelson, Dodd, and Smith (1990) examined faculty willingness to provide instructional supports to students with LD at a 4-year institution of higher education. The participants included 141 teaching faculty in the academic division of Arts and Sciences, Education, and Business at a northwestern college. A survey instrument consisting of 18 items was divided into four categories to include assessing instructional, assignment, examination supports, and special assistance. Faculty members were questioned about their willingness or reluctance to provide specific instructional supports to students with LD. The instrument also provided an open-ended response section for faculty comments. The questionnaire was mailed to all participants with a

return rate of 75.8%, indicating that 107 faculty responded. A series of quantitative methods such as descriptive item analysis, ANOVA, and *t*-tests was employed for data analyses.

The results indicated that at least 50% of faculty was willing to provide 16 (88%) of the 18 types of educational supports listed. However, less than 50% of faculty was willing to provide the remaining two types of educational supports consisting of extra credit assignments and allowing misspellings, incorrect punctuation and grammar during examinations. Concurrently, at least 50% of faculty was reluctant to provide alternative assignments, copies of lecture notes, tape-recorded assignments (rather than written assignments), and extra time to complete examinations. The findings suggest that faculty is reluctant to provide some types of educational supports. According to faculty comments, willingness to provide educational supports to students with LD is linked to the concern of maintaining academic integrity. Faculty indicated that they would be willing to provide educational supports when reassured they would not lower academic standards. In the same way, faculty was willing to learn new methods for helping students with LD, while maintaining academic merit.

Similarly, Vogel, et al. (1999) studied the willingness and practices of faculty to make teaching and examination supports for students with LD. The researchers examined faculty perceptions of fairness in providing educational supports with respect to students without disabilities, and identified factors that impact faculty attitudes toward educational supports. The participants included 1,050 instructional faculties at a large, mid-western, public university that offered doctoral degree programs. A 5-point Likert-scale instrument consisting of 35 items, *A Survey on Students with Disabilities* was used to assess faculty attitude, knowledge, and practices about students with LD. The instrument consisted of multiple-choice items and open-ended questions. The instrument included items pertaining to students with LD based on a

comprehensive literature review. The instrument incorporated faculty contact with students with disabilities, willingness to provide teaching and examination supports, fairness of providing educational supports, and educational supports for teaching qualified candidates with LD. However, the researchers focused their data analysis on the willingness to provide teaching and examination supports and fairness to provide such supports to students with LD. The questionnaire was mailed to participants with a return rate of 40%, indicating 420 respondents. A series of *t*-test inferential statistics was conducted to analyze the data.

Results of the study demonstrated faculty willingness and reluctance to provide educational supports to students with LD. Faculty was willing to provide teaching and examination supports that included (a) tape recorded lectures, (b) one-on-one assistance, (c) reviewing or clarifying parts of the lectures or assignments, (d) commenting on drafts of papers, (e) assisting in preparing for exams, (f) taking exams in alternate location with additional time, (g) allowing the use of technology, calculators, spell checkers and word processors, and (h) providing partial credit for using correct processes. Conversely, faculty was reluctant to provide (a) copies of overheads, (b) outlines of their lectures, and (c) altering the format of an assignment or examination, such as tape recording questions, paraphrasing questions or providing objective questions instead of essay questions. Also, findings of the study indicated faculty perceptions about the level of fairness of providing educational supports for students with LD compared to students without disabilities. Furthermore, 91% of faculty agreed with providing course-related teaching supports and 86.6% agreed with providing examination supports to students with LD. However, although faculty perceived that it was fair to provide teaching and examination supports, they were reluctant to provide such supports to students with LD.

Another important finding of this study was identifying factors that affect faculty attitudes towards providing educational supports. Some faculty who had experience teaching students with LD reported feeling comfortable, they had the necessary skills and knowledge to implement teaching and examination supports in their classes. Some faculty also reported being knowledgeable about the various types of educational supports offered by disability services to students with disabilities. Furthermore, some faculty reported that they communicated with disability services to provide educational supports to students with disabilities.

Continuing to investigate faculty practices at institutions of higher education, Sweener, et al. (2002) studied faculty member's comfort with providing educational supports to students with LD. Participants included 502 instructional faculties at a 2-year, public, open-admissions community college. A 5-point Likert-scale survey instrument, *The Accommodation Survey*, was designed to assess faculty willingness to provide educational supports. The survey was mailed to all participants with a response rate of 45%, indicating 225 faculty members responded. Nonetheless, the number of respondents ranged from 212 to 224 since some faculty did not complete all items on the survey. Quantitative statistics was employed and a single mean score was used for data analysis. Further analysis of the data was conducted by collapsing the data into three categories (comfortable, neutral, and uncomfortable) to derive at the level of comfort faculty reported on each item.

The results of this study revealed that 3-9% of faculty indicated feeling comfortable with providing tape recorded lectures, use of note takers, additional time to complete assignments, and use of calculators and spelling dictionaries during class and exams. Conversely, a greater number, 21-36% of faculty indicated feeling uncomfortable with providing extra credit assignments, increased frequency of examinations with less content, substitution of an elective

course in lieu of a required course, and withdrawal of a course after the cut-off date. The findings of this study suggest that faculty was reluctant to provide educational supports that demand additional time and effort. Also, faculty level of comfort in providing instructional supports exceeds their comfort level in providing administrative supports.

Correspondingly, Norton et al. (1997) assessed the attitude of faculty members when providing educational supports to student with LD. The participants included 107 faculty members from 18 departments at a California community college located in north San Diego County. Faculty members had a student with a documented learning disability in their classes who requested and received an accommodation for at least one exam. A survey instrument was used to gather faculty opinions about educational supports. The instrument consisted of questions about examination supports, including provisions for extra time, appropriate amounts of extra time, levels of comfort in granting examination supports and additional types of educational supports that are considered acceptable. An overall return rate of 43%, indicating 46 responses, was used to analyze the data quantitatively.

The results of the study indicated that faculty generally felt comfortable providing educational supports to students with LD. In fact, only one faculty member reported feeling uncomfortable in providing educational supports. Nonetheless, there was variation in the extent to which faculty felt comfortable providing examination supports. For example, 95% of faculty felt comfortable providing extra time on exams, while the remaining 5% felt uncomfortable granting extra time, if time was an essential part of the task being assessed. Furthermore, 35% of faculty reported feeling comfortable granting unlimited time, 24% time and a half, 17% double-time, and 22% varying amounts of time depending on the exam. Additionally, 95% of faculty indicated feeling comfortable with students taking exams at disability services. Furthermore,

faculty level of comfort varied depending on the types of educational supports offered to students with LD. For example, 60% of faculty felt comfortable providing a reader; 50% felt comfortable explaining directions, 36% felt comfortable clarifying directions, 28% felt comfortable allowing the use of spell checker, 22% felt comfortable allowing the use of a calculator, 39% felt comfortable with allowing students to respond on test or blank paper, and 15% felt comfortable offering any educational supports recommended by disability services (Norton et al., 1997).

Extending the research on instructional supports at institutions of higher education Bourke, Strehorn, and Silver (2000) investigated the behaviors of faculty members and institutional support, and sought to identify institutional factors that facilitated or hindered the instructional support process. The participants included 485 faculty members at the University of Massachusetts at Amherst who had received accommodation letters through disability services, identifying students in their classes as having a documented learning disability.

A 5-point Likert-scale survey instrument was used to assess faculty's ability to provide requested instructional supports, their perception of providing such support, and their level of understanding concerning the need for instructional supports. The design of the survey allowed participants to answer questions about their experiences providing educational supports rather than asking about their beliefs without prior practice. Therefore, the survey instrument included an option of "Not Applicable" to account for circumstances faculty had not experienced. The questionnaire was mailed to participants with a return rate of 35%, indicating 170 respondents. A series of quantitative methods (frequencies and descriptive statistics, and ANOVA) were employed for data analyses.

The results of the study indicated that if faculty believed strongly that educational supports helped students with LD succeed, they had greater understanding for the need of

educational supports. Additionally, findings indicated that if faculty perceived they had support from disability services and their academic department, they also perceived a greater level of ease in providing educational supports. As a result, faculty who perceived they had support from disability services and their departments were more willing to provide (a) un-timed tests, (b) proctor exams, (c) additional time to complete assignments, and (d) alternative types of exams. The implementation of these educational supports was also related to level of labor intensiveness. Nonetheless, it was indicated that faculty required greater resources in providing alternative types of exams because they were most labor intensive. Moreover, as the number of students with LD requesting educational supports increased, faculty willingness to provide supports decreased.

More recently, Murray, Wren, and Keys (2008) explored faculty knowledge, attitudes, beliefs, and practices related to educating students with LD. The participants in the study included 640 faculty members in various academic divisions at a large private, urban university. A 5-point Likert-scale survey instrument was developed to evaluate faculty's general knowledge of students with LD and disability laws, as well as their perceptions of teaching and examination supports. The design of the survey included a review of research studies revealing several prominent themes on faculty knowledge, beliefs, and practices related to educational supports for students with LD. Also, published instruments regarding faculty attitudes were used to develop questions and incorporated for use into this broader survey instrument. Together, these approaches led to identifying five themes included in the instrument: (a) general knowledge of students with LD and laws pertaining to students with disabilities, (b) teaching supports, (c) examination supports, (d) support and resources, and (e) personal practices. The questionnaire was distributed through the internal mail system at the university to the participants with two

follow-up requests sent via electronic mail. The study had a return rate of 30%, indicating 194 respondents. Quantitative methods were employed and factor correlations were used for data analyses.

The results of the study revealed three distinct areas of faculty knowledge, beliefs, attitudes, and practices related to educational supports for students with LD. Faculty who reported greater fairness and sensitivity in providing educational supports to students with disabilities were more willing to provide various types of educational supports. Nonetheless, faculty was more willing to provide minor educational supports compared to major educational supports. These findings demonstrated that faculty members may perceive major educational supports as altering necessary academic requirements, thus compromising overall program quality. Also, faculty knowledge of LD influenced their practices in providing educational supports. For instance, some faculty perceived they had insufficient knowledge to make appropriate teaching and examination supports to students with LD. Furthermore, faculty perception of resource constraints affected their willingness or reluctance to provide educational supports. Faculty who perceived greater resource constraints were less likely to be willing to provide major educational supports, examination supports, and teaching supports. Generally, faculty members were also less likely to implement educational supports and personally invest in supporting students with LD.

These studies reveal faculty's willingness and reluctance to provide various types of educational supports to students with LD. The types of educational supports faculty were willing but reluctant to provide ranged from instructional and examination to administrative practices. Faculty's perceived level of support from their academic department and disability services influenced their attitudes toward implementing various types of educational supports to students

with LD. An overview of studies examining faculty attitudes toward educational supports for students with LD is presented in Table 2-2.

Table 2-2. Studies of faculty attitudes toward educational supports for students with learning disabilities

Study	Purpose	Participants	Setting	Instrument	Findings
Bourke, A. B., Strehorn, K. C., & Silver, P. (2000)	Investigate faculty's behavior toward instructional supports	485 Faculty	University of Massachusetts at Amherst	Questionnaire	Faculty's perceived support from disability services and their academic department influences their perceived level of ease for providing educational supports.
Murray, C., Wren, C. T., & Keys, C. (2008)	Explore faculty's perceptions of their attitudes, knowledge, beliefs, and practices related to educating students with learning disabilities	640 Faculty	1 large private, urban university	Questionnaire	Faculty knowledge, beliefs, and attitudes influence their practices in providing educational supports to students with learning disabilities.
Nelson, J. R., Dodd, J. M., & Smith, D. J. (1990)	Evaluate faculty's willingness to provide instructional supports	141 Faculty in Arts and Sciences, Education, and Business	1 northwestern college Four-year institution	Questionnaire	Faculty willingness to provide educational supports to students with learning disabilities is linked to their concern with maintaining academic integrity.
Norton, S. M. (1997)	Evaluate faculty's attitude toward educational supports	107 Faculty in 18 Departments	1 California community college located in north San Diego County	Questionnaire	There is variation in the extent to which faculty feels comfortable in providing examination supports.
Sweener, K., Kundert, D., May, D., & Quinn K. (2002)	Evaluate faculty's comfort to provide educational supports	502 Faculty	1 two-year, public, open-admissions community college	The Accommodation Survey	Faculty level of comfort in providing instructional supports exceeds administrative supports

Table 2-2. Continued

Study	Purpose	Participants	Setting	Instrument	Findings
Vogel, S. A., Leyser, Y., Wyland, S., & Brulle, A. (1999)	Evaluate faculty's willingness and attitude toward educational supports	1,050 Faculty	1 mid-western college, a large public university that offers Doctoral Degree programs	A Survey on Students with Disabilities	Faculty agreement is stronger regarding fairness in providing teaching and examination supports than willingness to implement such supports to students with learning disabilities.

Summary of the Literature on Faculty

Faculty's primary role in working with students with LD at institutions of higher education is providing the necessary types of educational supports for learning. Six research studies were reviewed related to this topic. Nelson, Dodd, and Smith (1990), Norton (1997), Sweener, Kundert, May and Quinn (2002), and Vogel et al. (1999) identify faculty willingness and reluctance to implement educational supports. The types of educational supports that faculty is willing but reluctant to implement are teaching, examination and administrative practices. Also, Bourke, Strehorn, and Silver (2000), Murray, Wren, and Keys (2008), Norton (1997), and Vogel et al. (1999) identify faculty attitudes toward providing educational supports for students with LD. Faculty's beliefs about and understanding of educational supports were assessed to demonstrate how they influenced implementation of teaching and examination practices. Faculty's responsibility to provide educational supports to students with LD is an integral part of offering equal access to academia.

Willingness and reluctance to implement educational support

Several researchers identify the types of educational supports that faculty was willing but reluctant to implement for students with LD (Nelson, Dodd, & Smith, 1990; Norton, 1997; Sweener et al., 2002; Vogel et al., 1999). Faculty was willing to implement teaching and examination supports that included (a) readers, (b) note takers, (c) tape recording lectures, (d) one-on-one assistance, (e) review of lecture or assignment, (f) explaining or clarifying directions, (g) comments on rough drafts, (h) providing additional time to complete assignments, (i) alternative format for required assignments, (j) offering partial credit for using correct processes in math problems, (k) assistance in preparing for exams, (l) taking exams in another location with proctor, and (m) use of additional time, technology, calculator, word processor, and spell checker during examinations. Conversely, faculty was reluctant to implement teaching and

examination supports that included (a) copies of lecture overheads, (b) outlines of lectures, (c) extra credit assignments, (d) allowing tape recorded assignments rather than written assignments, (e) use of proofreaders, (f) allowing misspellings and incorrect grammar and punctuation, and (g) modification of examinations (Nelson et al.1990; Norton, 1997; Sweener et al. 2002; Vogel et al., 1999). Furthermore, faculty was reluctant to implement administrative supports that included substituting courses and withdrawing from courses after the official withdrawal dates (Sweener et al.2002).

Although most faculty support the idea of fairness in providing course related teaching and examination supports for students with LD compared to students without disabilities, faculty also reported a lower degree of willingness to implement such supports. The reluctance of faculty to implement teaching and examination supports may be linked to the amount of time and effort necessary to provide such supports. For example, additional time is required to develop an alternative exam with parallel cognitive requirements such as tape recorded answers to essay questions. However, allowing tape-recorded lectures and exams to be taken at disability services would potentially demand less time of faculty. Therefore, faculty was willing to implement teaching and examination supports that were less time consuming and when they perceive that they had support from disability services to provide such practices (Bourke, Strehorn, & Silver, 2000; Murray, Wren, & Keys, 2008; Vogel et al., 1999).

Beliefs about and understanding of educational supports

Research indicated that when faculty members were able to communicate with disability services regarding the needs of students with LD the more likely they were to understand the necessity of educational supports (Vogel et al., 1999). Also, the greater the support from disability services and each academic department, the greater the opportunity for faculty to

perceive having the resources necessary for implementing teaching and examination supports. For example, faculty members found it easier to implement alternative types of exams, copies of lecture notes, and educational supports when they were familiar with disability services (Bourke, Strehorn, & Silver). As a result, a team approach among faculty, academic departments, and disability services is critical in providing various types of educational supports for students with LD (Bourke, Strehorn, & Silver; Murray, Wren, Keys, 2008).

Similarly, faculty beliefs about and understanding of educational supports may be a result of their experiences of working with students with LD. Some faculty members who have taught students with LD were more willing to spend time mentoring and providing extended time on examinations. Furthermore, some faculty, who had experience working with students with LD were willing to change their teaching practices. For instance, one faculty member, once reluctant to provide educational supports, became an advocate on behalf of students with LD by encouraging other faculty to implement teaching supports to meet the needs of diverse learners (Norton, 1997).

In conclusion, the institution and disability services determine the types of educational supports that faculty needs to implement for students with LD. Although faculty is required to implement educational supports that are prescribed for students, they may also offer additional supports to assist students with learning, completing coursework, and program requirements. On the other hand, some researchers found that faculty was reluctant to implement educational supports that were offered by institutions and disability services, as well as any supports that extended beyond the required course minimum. Faculty members who were reluctant to implement various types of educational supports for students with LD were concerned with

maintaining academic integrity and fairness for students without disabilities (Nelson, Dodd, & Smith, 1990; Murray, Wren, & Keys, 2008).

Additionally, faculty is at the center of making the classroom environment receptive to the inclusion of students with LD by understanding their needs and how they may be addressed. Faculty members who are knowledgeable about educational supports for students with LD provided a sense of belonging (Graham-Smith & Lafayette, 2004; Norton, 1997). Therefore, disability services and academic departments need to work collaboratively with faculty in order to create welcoming learning environments for students with LD (Bourke, Strehorn, & Silver, 2000; Murray, Wren, & Keys, 2008).

Student Perceptions of the Postsecondary Climate Regarding Educational Supports

Students with disabilities are concerned with creating an environment that is conducive to learning while enhancing their academic and career goals. Students with disabilities are able to create positive learning environments by establishing strong interpersonal relationships with faculty and staff at disability services. Thus, students with disabilities emphasize the need for a warm caring environment and a strong sense of belonging (Graham-Smith & Lafayette, 2004). Research indicates that students' relationships with faculty and staff at disability services are essential for their successful outcomes at institutions of higher education (Dowrick et al., 2005; Elacqua et al., 1996). In fact, students with disabilities rely on educational supports to be implemented by faculty and disability services to help them accomplish their learning goals.

Review of the Literature on Student Perceptions

Since the passage of ADA, an increasing number of students with disabilities are entering higher education, becoming part of the academic learning community. Students with disabilities enrolled in higher education are entitled to request and receive educational supports to allow them to compete alongside their non-disabled peers. Therefore, researchers have studied student

perceptions of the postsecondary climate regarding educational supports. Researchers describe the types of educational supports that students perceive as beneficial for learning (Beilke & Yssel, 1999; Dowrick et al., 2005; Elacqua et al., 1996; Graham-Smith and Lafayette, 2004; Houck et al., 1992; Sharpe et al., 2005). Additionally, researchers explain students' perceptions of faculty attitudes and disability services in providing educational supports (Beilke & Yssel; Dowrick et al.; Elacqua et al.; Houck et al.; Sharpe et al.).

Houck et al. (1992) evaluated the perceptions of students regarding the sensitivity of the post-secondary climate toward students with LD. The participants in this study included 46 students with various types of LD who were registered with the office of disability student services. The participants consisted of 23.9% seniors, 34.8% juniors, 19.6% sophomores, 19.6% freshmen, and 2.2% graduate students. Students indicated belonging to a range of eight different colleges and majors. Participants also included 89.9% male and 10.1% female of which 93.5% were enrolled full-time and 6.5% part-time.

A telephone interview was developed based on a review of related literature and in accordance with specific data associated to a project sponsored by the university's equal opportunity/affirmative action incentives grant program. The survey instrument contained 12 structured response items in a 5-point Likert-scale format and open-ended items eliciting respondents concerns and suggestions. The validity and reliability of the interview instrument was not established, thus causing limitations. One researcher participated in a brief training session to conduct the interviews of all students, thus maintaining confidentiality. A series of quantitative methods (descriptive statistics and ANOVA) were employed for data analyses of fixed response items. Also, content analysis was implemented to analyze responses of unstructured items.

The results of the study revealed that 76% of students with LD expressed concern about the campus environment. In fact, students perceived a lack of understanding of LD and the need for educational supports from individuals in the learning community. Respondents expressed that a lack of awareness concerning students with LD was exhibited by faculty being unfamiliar with the referral processes and reluctance to make educational supports (tape-recorded lectures and alternative assignments) available for learning. As a result, students feared faculty bias and indicated a need to increase faculty awareness of LD. For instance, students suggested that printed materials and videos related to the need for educational supports be used at faculty professional development workshops. Additionally, students expressed concern about their need for longer periods of study time (compared to their peers without LD), an overemphasis of grades as opposed to learning, and large class or university size. Despite student concerns, they believed that receiving course-related educational supports was fair and that they were capable of completing degree programs.

Another important finding of this study indicated that 87% of students with LD considered university support services to be valuable in helping them learn. The types of educational supports that students with LD identified as beneficial include (a) note takers, (b) untimed or extra timed exams, (c) tests taken in alternate locations, (d) books on cassettes, (e) tutors, (f) study skills support, (g) counseling, and (h) a letter requesting accommodations mailed to faculty. Students also expressed disability services personnel were essential in helping them succeed.

Subsequently, Elacqua et al. (1996) examined students' perceptions in requesting and receiving educational supports and their perceptions of faculty attitudes toward educational supports. The participants in the study included 37 students with various disabilities registered

with the office of student disability services at a medium size Midwestern University. The participants consisted of 41% seniors, 30% juniors, 11% sophomores, 16% freshmen and graduate students respectively. The age of participants ranged from 19 to 48 with the median age of 24 years. More than half (57%) of the participants in the study were female.

A comprehensive 37-item telephone survey instrument was developed using preliminary interviews of students with disabilities, interviewer training, role-plays, and pilot tests. The survey consisted of qualitative questions about educational supports requested, positive and negative aspects of the educational support process, and concerns of students with disabilities. Quantitative items were assessed using a 5-point Likert-scale model ranging between strongly agree to strongly disagree. The quantitative items assessed students' perceptions with respect to requests for educational supports for classroom instruction, perceived efficacy of educational supports, knowledge of students and faculty regarding educational supports, and students' overall satisfaction in receiving educational supports (Elacqua et al., 1996).

The results of the study demonstrated that students with disabilities were familiar with the referral process and types of educational support services available. Also, students with disabilities reported being given the same opportunities to learn as their non-disabled peers when provided with instructional supports. Nonetheless, the majority of students indicated feeling stressed when requesting educational supports, embarrassed about requesting supports from professors, a sense of isolation from peers for requesting such supports, and unsure if their requests would be granted (Elacqua et al., 1996).

Furthermore, students expressed having requested and received several types of educational supports. The types of educational supports include the following: (a) a quiet room with a proctor for exams, (b) un-timed or extended time on exams, (c) readers for exams, (d)

exam questions worded in simplified, straight forward manner, (e) alternative testing formats such as oral or essay, (f) more exams with less material, (g) replacing lowest test scores with an alternative assignment such as a paper, (h) note takers, (i) receiving a copy of lecture notes and overheads, (j) tutoring, (k) tape recorded lectures, (l) books on tape, (m) extended time on papers and projects, (n) overlooking spelling errors, and (o) writing information and key concepts on the board. Students with disabilities also reported that testing supports, priority registration, and tutoring were helpful (Elacqua et al., 1996).

Another important finding of this study by Elacqua et al. (1996) indicated students' perceptions of faculty attitudes regarding educational supports. Students perceived that faculty members' lacked knowledge about the referral process, and the various types of disability support services available. Students perceived that instructors were not interested in learning about students with disabilities and the types of support services available. Students were also concerned with instructors who did not comply with requests for educational supports and violation of student confidentiality. Students indicated they did not want faculty to view them as unable to be successful in college. Students felt that instructors were unable to understand their need for educational supports to compete alongside their non-disabled peers. However, students felt that faculty members who were educated about disabilities and educational supports were supportive and understanding.

Similarly, Beilke and Yssel (1999) studied student's perception of faculty members' attitudes and whether or not they may impede the academic progress and adjustment of students with LD in higher education. The participants in the study were 10 undergraduate students at a large Midwestern University. The participants were of five men and five women between the ages of 19 to 47. The students' disabilities ranged from physical such as spina bifida and cerebral

palsy, to LD. A structured script was used to conduct the interviews that were audio taped and transcribed. The transcripts revealed stories regarding students' experiences with the postsecondary climate and faculty attitudes toward requesting and receiving educational supports.

Results showed that students with disabilities experienced fewer positive relationships with faculty members. Although students felt that some faculty members were willing to offer instructional supports, faculty attitudes did not always translate to a positive classroom experience. Students with disabilities that experience negative attitudes from faculty describe being ignored, being interrupted when speaking, maintaining physical distance, avoiding eye contact, offering little guidance and/or criticism, and attributing success to factors other than abilities. Students with disabilities expressed that faculty members seem to have lower expectations of them and appear to doubt their abilities to succeed causing students to question their own abilities. Also, students with physical disabilities were more likely to have a positive classroom experience than students with "invisible" disabilities such as LD. Therefore, students with invisible disabilities felt that they faced a double challenge in proving to faculty their need for educational supports (Beilke & Yssel, 1999).

Continuing the investigation of students' perceptions of educational supports at institutions of higher education, Dowrick et al. (2005) examined student-identified barriers to educational supports which included faculty attitudes and disability services. The participants in this study were recruited from 10 sites nationwide to include community colleges and universities. The sites represent large cities, small cities, and rural locations in different geographical regions of the United States. Participants consist of students with a range of disabilities including physical, sensory, cognitive, emotional, and learning disabilities.

Participants also included a broad range of ethnic and cultural backgrounds including African American, Native American, Asian, Latino, and Pacific Islander; but did not mention Caucasian non-Hispanic.

Focus group research was used to conduct interviews and gather qualitative data on student motivation, behavior, feelings, and decision-making processes. A list of questions was prepared to facilitate discussion and provide structure to focus group participants. The questions were prepared, pilot tested, and later modified by site coordinators in collaboration with participants, local providers, and researchers to address each site's focus. The focus groups consisted of three to 19 participants involved in a one to two hour interview session. The focus groups were held in diverse communities to enhance transferability. The questions were provided to participants prior to the discussion. The interviews were video and audio taped for analysis. The transcription and notes were used to develop themes for each group. Subsequently, the transcriptions were analyzed independently to develop a coding scheme. The first analysis of the transcriptions produced two lists of themes. Thereafter, researchers compared results and developed a final list of themes based on rankings according to frequency of occurrence (Dowrick et al., 2005).

The results of the study illustrated students' perceptions of faculty attitudes about educational supports. Students were concerned about disclosing their disabilities to faculty given the stigma associated with educational supports. Nonetheless, disclosure of the student's disability was facilitated when accompanied by a letter from disability services explaining their need for educational supports. Also, students encountered faculty who were reluctant to provide requested educational supports. Students' perceived that faculty members were unaware of

students' rights which would account for their questioning of the requested educational supports (Dowrick et al., 2005).

Moreover, findings revealed student-identified barriers associated with disability services. For example, students reported a lack of available staff to provide assistance at the disability services office. Thus, students did not receive appropriate and timely support. Students also explained that when meeting with disability specialists, they received a letter of accommodations that had been prepared for all students with the same disability. Therefore, students were offered generic educational supports and left to request additional services on an individual basis. As a result, students expressed the need for disability services to provide educational supports on an individual basis rather than according to the individual's diagnosed disability. Students recommend that disability services provide information to students and develop a collaborative relationship with the administration. Furthermore students felt that disability services should advise faculty to provide educational supports during instruction and student-related activities (Dowrick et al., 2005).

On the contrary, Graham-Smith and Lafayette (2004) identified characteristics associated with a quality disability service program which provided the most beneficial types of educational supports as viewed by students. Study participants included 318 students with physical, psychological, attention, and learning disabilities. The participants received educational supports from the Office of Access and Learning Accommodations (OALA) at Baylor University.

An electronic structured interview consisting of open-ended questions was used to gather data. The interviewer collected responses based on a pre-existing coding scheme consisting of several themes including counseling meetings, caring people, extra time on tests, alternate testing site, time management instruction, specific subject tutoring, study skills introduction, self-

advocacy, assistive technology, early registration, and sense of security. Responses totaled 71 and were received and analyzed as unstructured interviews since the emergent themes determined the categories of responses (Graham-Smith, & Lafayette, 2004).

Results of the study showed that the educational supports that students with disabilities found to be beneficial included (a) subject tutoring, (b) development of study skills, (c) time management and learning strategies, (d) test reader, (e) a quiet room or alternate testing site, (f) oral rather than written answers, (g) the use of the computer lab and assistive technology devices, (h) counseling, and (i) early registration. The educational supports most frequently mentioned by students with disabilities as beneficial included a caring environment that promoted caring people and a sense of security. Also, students with disabilities mentioned feeling empowered when disability services provided instruction in self-advocacy skills along with letters to professors for request for services (Graham-Smith and Lafayette (2004).

Extending the research on student perception of educational supports at institutions of higher education, Sharpe et al. (2005) reported on the range of instructional supports and assistive technology used by postsecondary graduates with disabilities. The participants in this study included 139 postsecondary graduates with disabilities that were enrolled with disability services. The study included 78% of students who graduated from a two-year institution and 22% from a four-year institution. Of the participants in this study, 33% indicated their primary disability as a learning disability, 23% indicated attention deficit disorder, and 27% indicated disabilities in more than one area. Participants' age range was from 18 to 55 years. Participants were identified as 86% Caucasian, 5% African American, 4% multiethnic and Asian and Pacific Islander, and 1% Hispanic. Participants were selected from 20 postsecondary institutions from different geographical regions across the United States. Although students were recruited from

two and four year institutions, one exception included the participation of the students in the Michigan vocational rehabilitation system (Sharpe et al. 2005).

A structured interview questionnaire was developed for this study. Collaborative institutions and items adapted from a compilation of survey sources contributed to the content for the questionnaire. The instrument was pilot tested with postsecondary graduates with disabilities. Thereafter, the results of the pilot test and recommendations from researchers in the field of educational supports were used to develop the final interview protocol. The structured interview questionnaire included 50 items consisting of dichotomous questions, multiple selectable categories and several open-ended questions. The Spearman rank order coefficient, Kappa Values and frequency counts were used to analyze the data (Sharpe et al. 2005).

The results of the study indicated the types of instructional supports provided to students with disabilities in higher education. The most common types provided included (a) extra time on tests and assignments, (b) a quiet learning environment, (c) tutorial services, and (d) priority registration for the purpose of scheduling options. Similarly, students most commonly used assistive technology devices such as (a) scanners, (b) talking books, (c) note taking devices, (d) text help software, (e) specialized tape recorders, and (f) voice recognition software (Graham-Smith and Lafayette (2004). Nonetheless, it should be noted that the use of assistive technology diminished, as the devices became increasingly expensive, complex, and specialized in usage. Although assistive technology devices were helpful for students with disabilities, less than a third of the participants indicated being taught how to use assistive technology by staff at disability services. Of the participants, 15% expressed the need for increased access to disability support services to ensure continued use of assistive technology. Correspondingly, 12% of the participants recommended that disability services provide information about the use and

availability of assistive technology, followed by 12% designating the importance for institutions to purchase needed assistive technology devices (Sharpe et al. 2005).

These studies reveal student perceptions of the postsecondary climate regarding educational supports. The types of educational supports that students with disabilities find beneficial are instructional, examination, and administrative supports. Nonetheless, students with disabilities mention that disability services should increase their support for assistive technology devices. Students with disabilities feel uncomfortable requesting educational supports because they perceive that faculty lacks knowledge about their rights. However, students feel empowered when disability services provides advocacy. An overview of studies examining student perceptions of the postsecondary climate regarding educational supports is presented in Table 2-3.

Table 2-3. Studies of student perceptions of the postsecondary climate regarding educational supports

Study	Purpose	Participants	Setting	Instrument	Findings
Beilke, J. R., & Yssel, N. (1999)	Discuss student's view of faculty's attitude toward educational supports	10 Undergraduate Students	1 Large Midwestern University	Structured Interview	Students with invisible disabilities feel that they face double the challenge in proving to faculty their need for educational supports.
Dowrick, P. W., Anderson, J., Heyer, K., & Acosta, J. (2005)	Explore student identified barriers to access educational supports	3-19 Students per Focus Group	10 Institution Sites Nationwide to include large cities, small cities, and rural locations Two-year and four-year institutions	Focus Group Interviews	Students note concern for disclosing their disability to faculty. Students perceive faculty is unaware of their rights for educational supports and identify barriers associated with disability services.
Elacqua, T. C., Kruse, B. G., Rapaport, R. J., & Allen, S. (1996)	Assess student's perception of the educational support process	37 Students registered at Disability Services	1 Medium size Midwestern University	Telephone Survey	Students are embarrassed to request educational supports. Students perceive that faculty is reluctant to provide necessary educational supports.
Graham-Smith, S., & Lafayette, S. (2004)	Determine student's perception of disability services	318 Students registered at the Office of Access and Learning Accommodations	Baylor University	Electronic Structured Interview	Students feel empowered when disability services provide self-advocacy skills and a letter requesting educational supports. Students identified instructional, examination and administrative supports as beneficial.

Table 2-3. Continued

Study	Purpose	Participants	Setting	Instrument	Findings
Houck, C. K., Asselin, S. B., Troutman, G. C., & Arrington, J. M. (1992)	Evaluate student's perception of the post-secondary climate toward students with learning disabilities	46 Students registered at the Office of Student Disability Services	1 University	Telephone Interview Instrument	Students perceive the learning community lacks knowledge about students with learning disabilities. Students identified a range of educational supports as beneficial for learning.
Sharpe, M. N., Johnson, D. R., Izzo, M., & Murray, A. (2005)	Examine range of instructional supports used by students	139 Postsecondary Graduates registered with Disability Services at time of Enrollment	20 Institution Sites Nationwide representing different geographical regions Two-year and four-year institutions and a Michigan vocational rehabilitation system	Structure Interview Questionnaire	Students identified instructional supports as the most common type of educational support provided, yet emphasized the lack of support for assistive technology devices available at disability services.

Summary of the Literature on Students

Students with disabilities rely on educational supports for completing coursework and program requirements. Six research studies related to this topic were reviewed. Beilke and Yssel (1999), Dowrick et al. (2005), Elacqua et al. (1996), Graham-Smith and Lafayette (2004), Houck et al. (1992) and Sharpe et al. (2005) assessed the types of educational supports that students with disabilities request as well as the types they found beneficial at institutions of higher education. The types of educational support that students with disabilities requested and found beneficial are instructional, examination, and administrative. Additionally, Beilke and Yssel (1999), Dowrick et al., (2005), Elacqua et al., (1996), Houck et al., (1992), and Sharpe, et al., (2005) evaluated the role of faculty and disability services with respect to helping students access educational supports. Given that students with disabilities rely on educational supports to be implemented by faculty and disability services, there is a need to assess whether or not students perceive that they are getting the supports they need.

Types of educational supports requested

Several researchers have identified the types of educational supports that students with disabilities request at institutions of higher education (Beilke & Yssel, 1999; Dowrick et al., 2005; Elacqua et al., 1996; Sharpe et al., 2005). The research shows the most common types of instructional and examination supports requested by students include (a) enlarged print, (b) preferential seating, (c) note takers, (d) recording of lectures, (e) copies of lecture notes or overheads, (f) writing key concepts and assignments on the board, (g) changing the delivery of instruction, (h) taped reading materials, (i) tutoring, (j) allowing spelling errors, (k) test reader, (l) extra time on exams and assignments, (m) a quiet room or alternative testing sites, (n) more exams covering less material, (o) alternative testing formats such as oral or essay, (p) test questions worded in a simplified manner, (q) replacing the lowest test score with an alternative

assignment, (r) assistive technology devices, (s) specialized software and, (t) communicating with instructor via e-mail (Elacqua et al.; Sharpe et al.). The administrative supports that students with disabilities request include the following: (a) class relocation, (b) priority registration, (c) modified schedule, (d) faculty mentors, (e) school-to-work programs, (f) internships and job training and (g) assistive technology devices during transition to employment (Dowrick et al.; Sharpe et al.).

Additionally, the types of educational supports that students with disabilities found to be beneficial included (a) subject tutoring, (b) development of study skills, (c) time management and learning strategies, (d) test reader, (e) a quiet room or alternate testing site, (f) oral rather than written answers, (g) the use of the computer lab and assistive technology devices, (h) counseling and (i) early registration. The educational supports most frequently mentioned as beneficial to students with disabilities included a caring environment and a sense of security (Elacqua et al., 1996; Graham-Smith & Lafayette, 2004 Houck et al., 1992).

Although students with disabilities requested various types of educational supports that they perceived as beneficial, their requests for such supports may not be granted. In fact, instructional and administrative supports were denied to 35% of students with disabilities. Administrative supports, such as additional time on exams, additional time to complete assignments, and class schedule modifications were denied to 30% of students with disabilities. Also, 17% of students with disabilities were denied requests to use assistive technology (Sharpe et al., 2005). Consequently, students with disabilities that are denied the necessary educational supports experienced academic pressure, stress, anxiety, and poor performance (Elacqua et al., 1996).

Perception of faculty

Students with disabilities expressed concern about faculty attitudes and willingness to help them access educational supports. Students with disabilities perceived that the denial of educational supports necessary to meet their learning needs is a result of faculty's lack of understanding regarding the needs and rights of students (Dowrick et al., 2005; Houck et al., 1992). Students with disabilities reported that when working with faculty in academic settings, they were aware that faculty members demonstrate a lack of knowledge about learning disabilities, variability among disabilities, disability law, and availability of supports and services (Beilke & Yssel, 1999; Elacqua et al., 1996; Houck et al.). For example, some students with LD have encountered faculty members who are reluctant to provide educational supports and question students about the supports being provided. Therefore, when students mention that they have a "hidden disability" (LD) they feel they must convince professors of their need for educational supports. Students with LD also expressed that they have to excel in order to prove to faculty that they belong in their programs. Students with LD explain that they lose self-confidence if they perceive that faculty has lower expectations of them or doubt their ability to succeed. Thus, students with LD experience difficulty with academic progress and adjustment to higher education (Beilke & Yssel). However, students with disabilities also report that faculty attitudes and willingness to help change as they become knowledgeable about diverse learners (Dowrick et al.). This finding indicates a need for disability services to provide professional development programs for faculty in order to educate them about students with LD and educational supports (Elacqua et al.; Houck et al.).

Perception of disability services

Students with disabilities expressed concern about the effectiveness of disability services in helping them access various types of educational supports. Students with disabilities perceived that the denial of educational supports is exacerbated by the lack of personnel available in disability services. Disability services grant students with “emergencies” priority services, leaving many students with disabilities concerned and unassisted. Also, students with disabilities suggested that disability services needs to employ personnel that assist in developing programs of study designed according to the student’s disability (Dowrick et al., 2005). Furthermore, students with disabilities expressed the need for disability services to assist students in accessing the least common types of educational supports such as disability specific scholarships (Sharpe et al., 2005). Students with disabilities stated that being granted educational supports allowed them to understand course material, enhance personal performance, and improve self-confidence and self-esteem. The concerns of students with disabilities convey the need for disability services to improve university services for students in order for them to access necessary educational supports (Elacqua et al., 1996).

In conclusion, improving access to educational supports for students with disabilities at institutions of higher education is a collaborative process between administration, disability services, faculty, and students (Elacqua et al. 1996; Houck et al., 1992). For this reason, there is a need for institutions of higher education to increase their awareness of the necessity of providing educational supports for students with LD. Disability services can contribute to this increased awareness by disseminating information during faculty and administrative seminars, and student orientation programs. Disability services can also educate the academic community by informing it about students with LD, disability law, and how legislation mandates access to educational

supports (Dowrick et al., 2005; Elacqua et al.; Houck et al.). Institutions of higher education that work collaboratively with disability services, faculty, administrators, and students are able to diminish barriers and encourage equal access to educational opportunities for students with disabilities.

Summary

The studies reviewed here attest to the need for further research related to the various types of educational supports at institutions of higher education for students with disabilities. Researchers have assessed (a) the various types of educational supports offered at institutions of higher education, (b) faculty members' attitudes toward providing educational supports for students with LD, and (c) student perceptions of the postsecondary climate regarding educational supports. Although these studies further information on the use of educational supports at institutions of higher education, they do not offer information specifically related to the types of educational supports needed and provided to undergraduate and graduate students with LD.

Section 504 and the ADA mandate that students with disabilities have equal access to attend institutions of higher education; therefore institutions of higher education need to be prepared to provide various types of educational supports. Based on what is known about students with LD and their need for various types of educational supports, it is necessary to study the provisions needed and provided to undergraduate and graduate students with LD at institutions of higher education.

Rationale for the Study

Although there is a need to provide educational supports to students with LD in higher education, the types of educational supports that increase their retention is still unknown. Therefore, institutions of higher education must be cognizant of the effect that educational supports have on the outcomes of students with LD. A review of research studies on educational

supports for students with LD in higher education presents a rationale to conduct further research in the field. Several conclusions are made by the field regarding the results and limitations of the research studies which have already been done on educational supports for students with LD.

First, the body of research reveals that policy does not always lead to practice. The types of educational supports that students with LD requested and found beneficial are not always implemented by faculty, nor provided by institutions of higher education (Beilke & Yssel, 1999; Graham-Smith & Lafayette, 2004). Unfortunately, there is a lack of scientific evidence to suggest that specific types of educational supports benefit students with LD. Thus, students with LD continue to advocate for the types of educational supports that they perceive beneficial for learning.

Another limitation is that the amount of research on educational supports is scarce, thus researchers are unable to draw general conclusions about the various types of educational supports that are offered to students with LD. In fact, researchers show that some types of educational supports are offered more than others, however there is a lack of empirical evidence to suggest that the discrepancy is between instructional and administrative practices (Sharpe & Johnson, 2001; Stodden et al., 2001; Tagayuna et al., 2005). Additionally, research studies show inconclusive evidence with the types of administrative supports that are provided to students with LD and learning success. As a result, research studies are inconclusive in determining whether the various types of educational supports offered to students with LD meet their individual needs for improving learning outcomes.

Lastly, more than half of the research studies included a sample of participants with various disabilities, thus evidence suggests a limited amount of research focusing on students specifically with LD as a group of learners. Nonetheless, undergraduate and graduate students

with LD are diverse groups of learners; their needs for educational supports vary depending on the demand of academic tasks determined by their degree seeking status. As students proceed to graduate studies and academic demands are greater, the educational supports needed for graduate students differ from undergraduate students (Hadjioannou et al., 2007). Yet, the types of educational supports provided to undergraduate and graduate students with LD have been generic (Ganschow, Coyne, Parks, & Antonoff, 1999). Thus, the purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences with respect to the types of educational supports needed and provided for completion of coursework and program requirements.

CHAPTER 3 METHODOLOGY

Purpose of the Study

The purpose of this study was to compare undergraduate and graduate students with learning disabilities (LD) and identify their similarities and differences with the types of educational supports needed and provided for completion of coursework and program requirements. The investigation questioned whether or not the differences in academic demands at institutions of higher education for undergraduate and graduate students with LD affected the types of educational supports necessary for graduation. To fulfill the purpose of this study, the types of educational supports perceived as needed and provided for students with LD at institutions of higher education were examined. This study expanded the knowledge related to the types of educational supports that undergraduate and graduate students with LD may need at institutions of higher education.

In this chapter, I will describe the process and techniques used to conduct the current study. First, I will describe the criteria used for selecting participants, the setting in which the study was conducted, and the materials needed to carry out the study. Secondly, I will describe the instrumentation, experimental procedures, and data collection process. Finally, I will describe the research design, data analysis methods, and limitations of the study.

Research Questions

Quantitative research methods were used to answer four questions:

- (1) What types of educational supports do (a) undergraduate and (b) graduate students with learning disabilities perceive as needed?
- (2) What types of educational supports are being provided for (a) undergraduate and (b) graduate students with learning disabilities?
- (3) Is there a relationship between the perceived needs and the supports provided to (a) undergraduate or (b) graduate students with learning disabilities?

- (4) Do undergraduate and graduate students with learning disabilities differ in the (a) types of educational supports needed, (b) the types of supports provided for completion of coursework and program requirements, or (c) the relationship between needs and supports provided?

Description of the Null Hypothesis

The following null hypothesis was tested in the study:

H1: There are no statistically significant differences between undergraduate and graduate students with learning disabilities as to the types of educational supports they perceive as needed and the supports provided at institutions of higher education.

Participants and Settings

Prior to recruiting the participants, approval to conduct the research was obtained from the University of Florida Institutional Review Board (IRB), each participating educational institution IRB, and office of disability services. Copies of these approvals were given to the researcher (Appendix A).

Participants

The participants in this study included a sample number of 1,990 volunteers; however, the actual participants were selected based on the following criteria: (a) participants were students with LD. Students with LD were recruited through the office of disability services. Recruiting students through the office of disability services guaranteed verifiable documentation of students with LD; (b) participants were students with LD who had been enrolled in full-time or part-time university-level courses. Students with LD in undergraduate programs were enrolled in 6 credit hours (part-time) or 12 credit hours (full-time) or approved by the office of disability services for a reduced course load designated by the registrar's office as full-time status. Students with LD enrolled in graduate and professional programs were enrolled in 6 credit hours (part-time) or 9 credit hours (full-time) or approved by the office of disability services to register for a reduced course load designated by the registrar's office as full-time status; (c) third, students with LD were receiving

educational supports or made a previous request for such supports. An emphasis was placed on students with LD who received or made a past request for educational supports based on the premise that they were well informed about the types of educational supports they perceive as needed; (d) participants consisted of students with LD who were enrolled in undergraduate, graduate, and professional degree programs in various academic disciplines. For the purpose of this study, students with LD enrolled in professional degree programs were treated equally to graduate students in this study, since they had completed a four-year post-secondary degree, therefore pursuing advanced studies in higher education.

Settings

The researcher coordinated the site selection and chose nine sites nationwide as follows: (a) Iowa State University (ISU), (b) Louisiana State University at Baton Rouge (LSU), (c) Texas A & M University at College Station (TAMU), (d) University of Alabama (AU), (e) University of California at Irvine (UCI), (f) University of Iowa (UI), (g) University of Michigan at Ann Arbor (U-M), (h) University of Missouri at Columbia (UM), and (i) University of Oregon (UO). Nine sites were selected for the purpose of (a) obtaining a large sample size and (b) maintaining a large sample size in the event that one or more institutions decided to withdraw from the study. Nine sites were also selected to account for variance across institutions.

The nine sites were selected based on the following criteria: (a) size of enrollment, (b) type of institution and (c) available degree programs of study. The nine sites consisted of four-year, large or mid-size and public institutions located in different geographical regions of the United States. Two institutions were considered large enrollment: Texas A & M University (40,000 students) and the University of Michigan (46,000 students). Seven institutions were considered mid-size enrollment: the University of California at Irvine, University of Iowa, Louisiana State University, University of Missouri, Iowa State University, University of Alabama, and the

University of Oregon, with student populations ranging from 20,000 to 29,000 students. The institutions offered undergraduate, graduate, and professional degree programs in various academic disciplines. The institutions were also selected based on their tier ranking by U.S. News and World Report on America's Best Colleges in the Nation. The nine institutions were classified as tier one and ranked among the top 130 National Universities. As a result, these institutions had similar academic standards.

During the recruitment phase of the study, a formal letter was electronically mailed to the director of disability services inviting him/her to participate in the study. The letter informed the director of disability services of the following: (a) the purpose of the study, (b) the importance of his/her participation, (c) a summary of the procedures to be followed during the implementation phase of the research project, and (d) contact information for further information concerning the study (Appendix B). Institutions were contacted in groups of ten, once per week over a period of twelve weeks. Institutions that were non-responsive were contacted three times with a follow-up reminder notice. A follow-up phone contact was made only when initiated by the educational institution. A combination of 57 public and 26 private institutions were contacted and only those that met the criteria for the current study were selected.

Materials

The present study required the use of a computer with Internet access to web-based survey software. Also, the researcher prepared expert review and cognitive interview protocols (Appendix C) and electronic letters for survey implementation (Appendix D).

Instrumentation

The survey developed for this study - *Educational Supports in Higher Education* - was used to gather data about the types of educational supports that undergraduate and graduate students with LD perceive as needed and are being provided at institutions of higher education.

The survey was designed to include closed-ended and open-ended questions. Closed-ended questions included demographic information and lists of items describing instructional, examination, and administrative supports. Additionally, each list of items describing the types of educational supports was split into two response categories of provisions needed and provided. Open-ended questions offered participants the opportunity to share personal experiences related to requesting and receiving educational supports, as well as any information related to educational supports. Furthermore, the survey was developed using literature that identified the various types of educational supports available at institutions of higher education (Appendix E).

Pre-Field Methods

Pre-field methods were also implemented to help with the development of the survey. The pre-field methods were conducted in the following sequence: (a) a review of the literature, (b) expert reviews, and (c) cognitive interviews. Undergraduate and graduate students with LD were required to sign informed consents acknowledging voluntary participation in the cognitive interviews and pilot study (Appendix F).

Literature review

A comprehensive review of the literature offered information on the educational supports offered at institutions, implemented by faculty, and found to be beneficial for students with disabilities. A total of 17 articles were reviewed. Research studies were evaluated for various types of educational supports from the perspective of institutions, faculty, and students. The following procedures were used to identify various types of educational supports: (a) first, a list identifying educational supports was developed; (b) next, the list was analyzed to create themes; (c) following that, each theme related to educational supports was color-coded; and (d) finally, the designated themes related to educational supports were organized by categories to include instructional, examination, and administrative supports.

Expert reviews

Expert reviews were done to assess whether or not the survey questions were aligned with the objectives of the proposed study and considered adequate for the population of interest. A total of seven experts reviewed the survey for content, format, and clarity. Four experts in the field of disability services in higher education, two learning disability specialists, and a quantitative methodologist reviewed the survey questions. Disability service experts were requested to review the list of varying types of educational supports and suggest additional supports that were absent from the list. The information gathered from the expert reviews was used to make further revisions to the survey.

Cognitive interviews

The cognitive interviews were done to evaluate (a) respondents' comprehension of the questions, (b) retrieval of information from memory, (c) decision and response processes, (d) technical accuracy of the questions, and (e) structural problems in the questionnaire. A total of eight cognitive interviews were conducted. The cognitive interviews consisted of four undergraduate and four graduate students with LD. The cognitive interviews were implemented using think-aloud and verbal probing techniques. A combination of scripted and spontaneous probes was used during the cognitive interviews. The information gathered from the cognitive interviews was used to make further revisions to the survey.

Field Method

Pilot study

The survey was administered as a pilot study under the same condition to be implemented in the proposed study. The survey was electronically mailed to a sample number of 300 undergraduate and graduate students with LD at two large public institutions: the University of Florida and University of Texas at Austin. The survey used in the pilot study provided open-ended

questions encouraging participants to offer suggestions for improving the design of the survey. The results of the pilot test were used to obtain an estimated response rate, percentage of ineligibles, skipping patterns, inadequate response categories, and questionnaire length. The information gathered from the pilot test was used to make final revisions to the survey. The development of the survey concluded with this procedure.

Pilot results

The reliability of the survey was determined by assessing each group of items from the pilot study. A total of 136 items were included in the analysis and each group of items was evaluated using Cronbach’s alpha. In the social sciences, the reliability of an instrument is evaluated using the following criteria: .60 is adequate, .70 is acceptable, and .80 or higher is good (Rudner & Shafer, 2001). Table 3-1 illustrates a description for each subcategory, corresponding Cronbach’s alpha, number of items, and number of cases.

Table 3-1. Reliability analysis of the survey

Subcategory	Cronbach α	N of Items	N of Cases
Class Lectures	.74	10	20.0
Class Notes	.87	10	21.0
Class Assignments	.71	14	19.0
Reading & Writing	.80	12	18.0
Academic Development	.91	10	19.0
Assistive Technology	.89	18	16.0
Testing and Exam	.75	22	16.0
Guidance and Support	.80	8	15.0
Financial Support	.74	6	16.0
Program Requirements	.81	8	16.0
Course Registration & Scheduling	.76	10	14.0
Transition to Employment	.87	8	14.0

Validity and Reliability

The pilot test accounted for measuring the survey’s validity and reliability. Validity refers to the degree in which the questions measures what it purports to measure. Content validity refers to “the extent to which a measurement reflects the specific intended domain of content” (Carmines & Zeller, 1991, p. 20). The content validity of survey instruments is assessed by conducting a

comprehensive overview of the items by trained individuals or by the individuals from the target population. The individuals make judgments about the relevance of the items. Seven experts examined the survey for content validity: (a) one ADA compliance officer, (b) three directors of disability services in higher education, (c) two learning disability specialists, and (d) one quantitative methodologist. Experts examined the questions for cogency, practicality, and logical sequence to determine that the questions met the objectives of the survey. Experts reviewed open-ended questions to verify that the questions offered respondents an opportunity to elaborate on their perception of faculty attitudes, disability services, and availability of educational supports. Also, experts in the field of disability policy in postsecondary education evaluated the survey to determine the extent to which each educational support listed was relevant to higher education. Eight undergraduate and graduate students who were registered with the office of disability services and had a documented learning disability also examined the survey for content validity. Students with LD evaluated the survey for comprehensibility of the directions and open-ended questions. Students identified the degree to which the open-ended questions allowed them an opportunity to share their experiences about disability services and the types of educational supports they had received while being enrolled in university-level courses. Students with LD also assessed the extent to which each educational support listed may be helpful toward the completion of coursework and program requirements. Furthermore, the data collected from the pilot study was analyzed to validate the survey.

Reliability refers to the degree to which a measure provides stability of the results. The reliability of the survey was determined by analyzing the answers to each question provided by respondents. The answer to each question was evaluated across respondents for consistency.

Experimental Procedures

In this section, experimental procedures are explained by identifying the steps followed to conduct the study that included survey implementation and data collection. This section of research design also describes the sampling methods and variables in the study, followed by the section of data analysis indicating how questions were coded and interpreted.

Survey Implementation and Data Collection

Phase one

The present study was implemented over a period of three weeks. This study required disability service coordinators at each of the nine institutions to distribute the survey. Therefore, the researcher established contact with disability service coordinators prior to implementing the study. First, the researcher contacted the disability service coordinators of the nine institutions via electronic mail and a follow-up phone conversation. A letter was sent to disability service coordinators explaining the purpose of the study, procedures to be followed, and the importance of their involvement in the study to recruit students with LD (Appendix G). Following that, disability service coordinators were contacted by phone to acknowledge receipt of the letter and engage in a conversation with the researcher. The purpose of the phone conversation was to assess the coordinators understanding of the purpose of the study, the procedures to be followed in distributing the survey, and forwarding all inquiries to the researcher.

Phase two

The survey was implemented using electronic mail. SurveyMonkey.com, a web-based service company was used to host the on-line survey and collect data (Finley). Dillman (2005) explains that Internet surveys require four consecutive contacts with respondents to increase response rates to a possible 49%. Four consecutive contacts were made with respondents in the following order: (a) a pre-notice letter with the attached informed consent, (b) a cover letter with

the attached survey, (c) a reminder notice, and (d) a re-sending of the survey. The survey was electronically mailed only to non-respondents on the second attempt.

The survey was distributed in the following order: First, the disability service coordinators from the nine institutions electronically mailed a pre-notice letter with the attached informed consent explaining to students with LD the purpose of the study, procedures to be followed, and the importance of their participation. Students with LD were informed that participation in the study was voluntary and would not affect their rights to request, receive, or continue to receive educational support services. Students with LD were also informed that recruitment of their participation was being done through disability services to insure anonymity and confidentiality. Second, two days after the pre-notice letter, disability service coordinators electronically mailed potential participants a cover letter with a hyperlink to the on-line survey. The cover letter explained the purpose of the study, the importance of their participation, their agreement to participate in the study, and how to answer questions and submit the survey. Students were requested to complete and submit the survey within three days. The cover letter also informed students about earning an incentive: a \$10 gift certificate to the university bookstore would be awarded to the first, middle, and last ten respondents to complete and submit the survey. However, students from the University of Alabama and the University of California at Irvine were excluded from receiving incentives due to state regulations. Additionally, the cover letter included researcher contact information for further clarification of the study and related questions. Third, disability service coordinators electronically mailed a notice three days after the initial survey was mailed to remind potential participants to complete and submit the survey. Lastly, disability service coordinators re-sent the cover letter with hyperlink to the on-line survey to non-responding students.

Research Design

Sampling frame

The sampling frame that was used for this study was the office of disability services at each of the nine institutions. The office of disability services had a list of electronic mail addresses for registered undergraduate and graduate students with LD who were eligible to receive various types of educational supports.

Census method

The census method was implemented based on the selection of participants for this study. In survey research, the census method is used to gather information from the total population. Therefore, the survey was electronically mailed to all students who were listed as having a documented learning disability and registered with the office of disability services. Also, in using the census method participation in the study was voluntary.

Web-Survey method

A probability method was used for this study in implementing a web-survey. A type of probability method for web survey is list-based samples for high-coverage populations. List-based samples for high-coverage populations are useful for surveying college students and highly specialized populations such as individuals with LD. A limitation of using list-based samples for high-coverage populations is the high non-response rate. Nonetheless, four contacts were made with respondents to counter balance non-response rates.

Data Analysis

Data coding

Quantitative research methods were used to conduct the study. The *Statistical Package for the Social Sciences* (SPSS) was used for data analysis. The data collected from the web-based service, Survey Monkey, was exported to SPSS for further data analysis. A data codebook was

developed for data analysis. In data coding, each respondent was assigned a case number and each survey item was represented as a variable. Additionally, a numerical code was assigned to each categorical and non-categorical response for each survey item. The data were analyzed using three quantitative statistical procedures to answer each research question as described in the following sections. Figure 3-1 illustrates the relationship of each research question addressed in this study. The figure illustrates (1) what types of educational supports (a) undergraduate and (b) graduate students with LD perceive as needed; (2) what types of educational supports are being provided for (a) undergraduate and (b) graduate students with LD; (3) the relationship between the perceived needs and the supports provided to (a) undergraduate or (b) graduate students with LD; and (4) differences between undergraduate and graduate students with LD in the (a) types of educational supports needed, (b) the types of supports provided for completion of coursework and program requirements, or (c) the relationship between needs and supports provided.

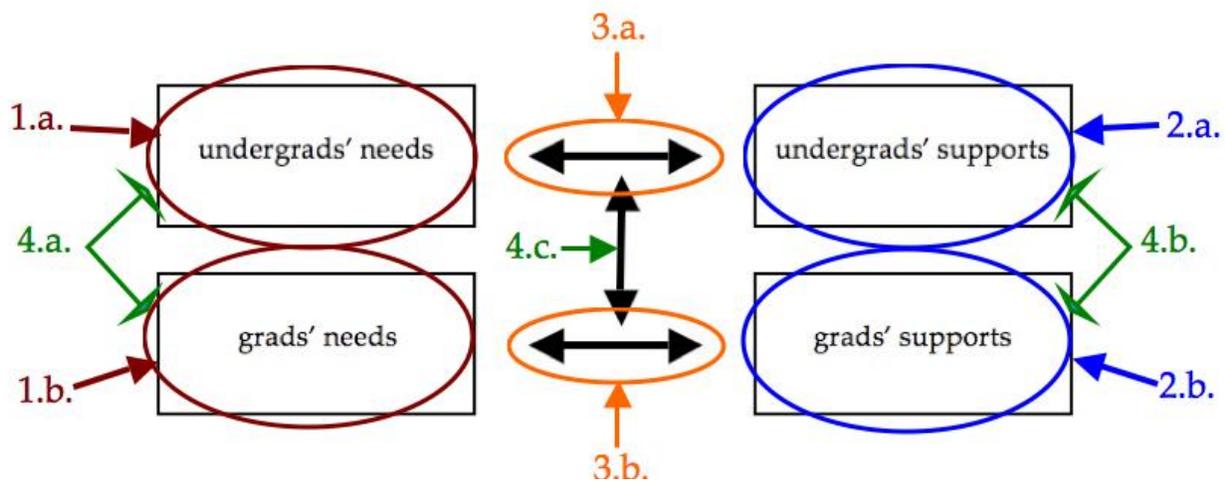


Figure 3-1 The relationship of the research questions

Research questions 1 and 2

The first two research questions required the use of descriptive statistics, thus frequency analysis was used to provide frequency data. Frequency counts were collected on the types of educational supports (e.g., instructional, examination, and administrative practices) that

undergraduate and graduate students with LD perceived as needed and that had been provided at institutions of higher education. Frequency counts allowed the data to be converted into percentages, thus representing a numerical value for interpretation.

Research question 3

Pearson correlation analyses were conducted to compare the strength and direction of a linear relationship between the educational supports needed and provided for undergraduate and graduate students with LD. The strength and direction of the correlation were observed as follows: a positive or negative .100 - .300 indicated a weak correlation, .300 - .500 indicated a moderate correlation, and .500-1.000 indicated a strong correlation.

Research question 4

The third research question required the use of a comparison measure. An independent sample *t*-test was used to compare the means between two groups that were not related. A comparison was made between undergraduate and graduate students with LD in relationship to the educational supports needed and provided at institutions of higher education. The null hypothesis tested was based on the assumption that there were no statistically significant differences between undergraduate and graduate students with LD with the types of educational supports they perceive as needed and provided at institutions of higher education. The null hypothesis was measured at a significant level of $p < .05$. The results of the *t*-test was analyzed to determine if there was no significant differences between both groups, therefore the results would conclusively accept or not accept the null hypothesis.

Additionally, a Chi-square test of independence was performed to determine whether or not there were statistically significant differences between undergraduate and graduate students with LD with the types of educational supports perceived as needed and provided at institutions of

higher education. The results of the Pearson Chi-square test was measured at a significant level of $p < .05$.

Supplemental analysis

A Two-Way Analysis of Variance (ANOVA) approach was used to assess the main effects and interactions for each educational support measure across the nine educational settings.

Limitations

There were three limitations to this study. First, the use of the census method and list-based samples for high-coverage populations could have caused a low response rate. Therefore, generalizability of the findings from this study may be limited and should be interpreted with caution. Second, with the use of survey methods the researcher is unable to account for the differences between response and non-response rate among participants. Thus, volunteer bias is plausible due to high non-response rates from participants in the sample. Third, students with LD who were contacted to participate in this study had given consent to the office of disability services to receive correspondence through electronic mail. As a result, there was an unknown number of students with LD who were registered with the office of disability services who were unable to participate in this study because they had declined consent to receive correspondence through electronic mail. Fourth, institutions in this study included four-year, mid-size or large public institutions and, therefore, the findings cannot be generalized to two-year and four-year, small public and private institutions of any size.

In summary, the findings of this study are intended to inform the higher education community about the various types of educational supports needed and provided for undergraduate and graduate students with LD. The proposed study resulted in demonstrating that the academic demands of undergraduate and graduate students with LD who responded to the survey differed at institutions of higher education. Results of the study showed that undergraduate and graduate

students with LD differed in the types of educational supports needed, yet current practices at institutions of higher education suggest that supports provided are the same for both groups. These findings will be discussed in detail in Chapter 4.

CHAPTER 4 RESULTS

Introduction

Disability laws, Section 504 of the Rehabilitation Act of 1973 and the American with Disabilities Act of 1990, have required institutions of higher education to provide various types of educational supports to students with learning disabilities (LD). Based on this mandate, this study was conducted to address four research questions as follows: (1) What types of educational supports do undergraduate and graduate students with LD perceive as needed; (2) what types of educational supports are being provided for undergraduate and graduate students with LD; (3) is there a relationship between the perceived needs and the supports provided to undergraduate or graduate students with LD; and (4) do undergraduate and graduate students with LD differ in (a) the types of educational supports needed, (b) the types of supports provided for completion of coursework and program requirements, and (c) the relationship between needs and supports provided? These research questions were the basis for which the following null hypothesis was tested:

H1: There are no statistically significant differences between undergraduate and graduate students with learning disabilities as to the types of educational supports they perceived as needed and the supports provided at institutions of higher education.

In summary, the purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences with respect to educational supports needed and provided for completion of coursework and program requirements.

The research findings in this chapter are presented in six sections as follows: (1) descriptive statistics are presented on the sample; (2) data from the frequency analyses are presented to answer research questions one and two; (3) data from the Pearson correlation analyses are presented to answer question three; (4) data from the *t*-test analyses and chi-square analyses are presented to

answer research question four and hypothesis one; (5) data from the Two-Way ANOVA analyses is presented to supplement the research findings of questions one, two, three, four, and hypothesis one; and (6) open-ended questions consisting of students' written responses were analyzed to create themes. The designated themes related to educational supports were organized into categories to include students' perceptions of institutions, faculty attitudes, beneficial learning practices, and academic learning difficulties. Also, themes addressing student difficulties in obtaining educational support services and how educational supports were helpful once received were included.

Descriptive and Inferential Statistics

Sample description. The sample number for this study was 1,990 students with LD who were registered with the offices of disability services at the nine participating institutions of higher education. The population consisted of students with LD who were enrolled between the Fall semester of 2008 and the Summer semester of 2009. The institutions of higher education were located in different geographical regions of the United States. All participating institutions of higher education were classified as Tier One Research Institutions and ranked in the top 130 National Universities by U.S. News and World Report on America's Best Colleges in the Nation. Demographic data for all student participants at each institution of higher education is shown in Table 4-1.

Table 4-1. Student participants at institutions of higher education

Institutions	N Registered with Disability Services (Percentage of Participants)	N of Participants (Response Rate %)
Iowa State University	200 (11.6)	34 (17)
Louisiana State University	148 (8.5)	25 (16.8)
Texas A & M University	302 (17.7)	52 (17.2)
University of Alabama	340 (22.5)	66 (19.4)
University of California	64 (3.8)	11 (17.1)
University of Iowa	177 (5.5)	16 (9)
University of Michigan	322 (12.3)	36 (11.1)
University of Missouri	44 (5.5)	16 (36.3)
University of Oregon	293 (12.6)	37 (12.6)
Total	1,990 (100%)	293 (14.7)

A total of four letters: (1) pre-notice letter, (2) cover letter, (3) reminder notice and (4) second reminder notice (only to non-respondents), with a hyperlink to the online survey (Appendix C), were distributed to each participating institution of higher education over a period of two weeks. These correspondences were mailed during a two to three-day period. A total of 1,990 students with LD were contacted. The number of students that responded was 293 or a response rate of (14.7%). Of the 293 students who started the questionnaire, 237 completed the questionnaire in its entirety (81%). One institution, the University of Alabama, was unable to provide the exact number of students with LD who received the questionnaire and, therefore, the sample number in this study represents an approximate number of total participants. As a result, the sample number of student participants and the return rate represented in this study are underestimates.

Demographic information was obtained for the sample number. Demographic information included (a) sex, (b) age, (c) race, (d) disability, (e) whether or not students had previously or were currently receiving educational supports and/or not previously or currently receiving educational supports, and (f) difficulty or ease in receiving academic services. Demographic information is shown in Table 4-2 through Table 4-3.

All students were enrolled in academic programs of study. The number of credit hours representing full-time or part-time status varied according to students' programs of study and their enrollment status pertaining to educational supports provided by the office of disability services at each institution. A further description regarding students' enrollment status related to the number of credit hours of university-level courses is mentioned in the methodology section. Information related to the academic program of study of student participants is presented in Table 4-4.

Table 4-2. Characteristics of study participants

Characteristics	Student Participants	
Sex	%	N
Male	44	129
Female	56	238
Age	%	N
18 -25	81	238
26-35	13	36
36-45	4	12
46 or older	2	7
Race	%	N
White	60	175
White, non-Hispanic	27	77
African American	6	17
Hispanic	3	10
Asian Pacific-Islander	2	5
Native American	1	4
Other*	2	5
Disability**	%	N
LD	51	150
LD/ADHD	49	143
Educational Supports	%	N
Previously Received	81	239
Not Previously Received	19	54
Currently Receiving	84	247
Not Currently Receiving	16	46
Academic Services	%	N
Difficulty in Receiving Services	24	55
Ease in Receiving Services	76	175

* Other race included Indian American and Pakistani.

**Other co-existing conditions included Asperger’s Syndrome, anxiety, post-traumatic stress disorder, depression, bipolar disorder, arthritis, cancer, Crohn’s disease, gastrointestinal disease, traumatic brain injury, quadriplegia and deafness.

Table 4-3. Academic program of study of student participants

Academic Program of Study	Student Participants	
Program Selection	%	N
Undergraduate	86	232
Graduate	14	61
Enrollment Status	%	N
Part-time	6	16
Full-time	94	277
Degree	%	N
Associate	1	4
Bachelor	78	228
Master	11	33
Specialist	1	3
Doctorate	9	25

Additionally, students’ academic programs of study included a range of majors. Students’ majors were themed and classified into several categories. The majority of students were in

academic programs such as math and science related disciplines. These programs included engineering, business, general education, health, and physical sciences. The second largest group was comprised of students enrolled in programs related to the social sciences such as psychology, education, history, dance, and advertising. The minority of students majored in academic programs such as languages, policy, law, and medicine. A list of academic majors and their corresponding number of enrolled students is presented in Table 4-5.

Table 4-4. List of majors and number of students in academic programs

Majors	N of Students
Agriculture	6
Animal Sciences	3
Architecture	1
Arts	19
Business	35
Communication	9
Computer Technology	4
Criminal Justice	6
Education	14
Engineering	37
Environmental Sciences	9
General Sciences	23
Health Sciences	17
History	15
Languages	11
Law	2
Liberal Arts	9
Mathematics	7
Medical	3
Philosophy	1
Physical Sciences	13
Policy Studies	8
Psychology	25
Social Work	6
Sociology	6
Undecided	4
Total	293

Inferential Statistics

Data were analyzed to determine (a) the types of educational supports needed for undergraduate and graduate students with LD; (b) the types of educational supports provided for undergraduate and graduate students with LD; (c) the relationship of undergraduate students with LD to educational supports needed and provided; (d) the relationship of graduate students with LD

to educational supports needed and provided; (e) a comparison between undergraduate and graduate students with LD to the educational supports needed; (f) a comparison between undergraduate and graduate students with LD to the educational supports provided; (g) a comparison to determine whether or not there were significant differences between undergraduate and graduate students with LD to the educational supports needed and provided, and (h) a comparison to determine whether or not there were significant differences between undergraduate and graduate students to the educational supports needed and provided across institutional settings. This section includes a description of the analyses and the results achieved.

Educational Supports Perceived by Undergraduate and Graduate Students as Needed

Frequency analyses were obtained for various types of educational supports perceived by undergraduate and graduate students with LD as needed. Frequency data is reported for each educational support category as follows: (a) instructional, (b) examination, and (c) administrative. A comparison of the various types of educational supports needed by group is presented in Table 4-6 through 4-8.

Educational Supports Provided to Undergraduate and Graduate Students

Frequency analyses were obtained for various types of educational supports provided to undergraduate students with LD. Frequency data is reported for each educational support category as follows: (a) instructional, (b) examination, and (c) administrative. A comparison of the various types of educational supports provided is presented in Table 4-9 through 4-11.

The Relationship Between the Educational Supports Needed and Provided for Undergraduate Students

Pearson correlation coefficients were obtained for undergraduate students' results of educational supports needed and provided - instructional, examination, and administrative - to examine the strength and linear relationship between the measures. Correlation coefficients yielded

several significant relationships. The correlation matrix for the undergraduate students' measures is reported in Table 4-11 through 4-22.

Table 4-5. Frequency comparison of instructional supports needed by group

Instructional Support Measures	Undergraduate Students	Graduate Students
Accommodation for Class Lectures	%	%
Preferential seating	25	75
Changing the delivery of instruction	47	54
Review of Lecture	26	75
Review of assignments	24	76
Explain or clarify Directions	44	56
Accommodation for Class Notes	%	%
Copies of overhead or notes	6	40
Outlines of lectures	64	36
Writing key concepts and assignments on the board	55	46
Note takers	51	50
Tape record lectures	46	53
Accommodation for Class Assignments	%	%
Comment on draft of papers	43	58
Extra credit assignments	44	57
Allowing tape recording of assignments rather than written assignments	48	51
Provide additional time to complete assignment	24	76
Complete an assignment in alternative format	11	89
Use of proofreader	17	83
Allowing misspellings, incorrect grammar or punctuation	64	36
Accommodation for Reading and Writing	%	%
Readers	18	82
Taped reading materials	37	63
Reading center	34	66
Scribe	42	58
Specialized writing instruction	18	82
Writing center	34	66
Services and Resources Available for Academic Development	%	%
Development of study skills	5	50
Time management	53	47
Learning strategies	51	50

Table 4-5. Continued

Instructional Support Measures	Undergraduate Students	Graduate Students
Subject tutoring	51	49
One-to-one assistance	51	49
Assistive Technology Accommodation	%	%
Learning to use computer software	19	81
Use of calculator	37	63
Use of word processor	43	57
Use of spell checker	50	50
Communicating with instructor via e-mail	38	62
Access to assistive technology lab	51	49
Access to staff trained in assistive technology	51	57
Access to specialized software	51	49
Assistive technology loan program	56	44

Table 4-6. Frequency comparison of examination supports needed by group

Examination Support Measures	Undergraduate Students	Graduate Students
Testing and Exam Accommodation	%	%
Extended-time on exams	94	6
Take exams in a quiet room with proctor	96	5
Frequent breaks during exam	83	8
More frequent exams covering less amounts of material	29	71
Allowing to answer oral rather than written questions	29	71
Use of multiple-choice questions rather than essay questions	26	74
Tape recording responses to exam questions	37	64
Test questions worded in a simplified manner	8	92
Replacing the lowest score with a paper	21	79
Assist in preparing of Exams	12	88
Offer partial credit for using correct processes in math	32	68

Table 4-7. Frequency comparison of administrative supports needed by group

Administrative Support Measures	Undergraduate Students	Graduate Students
Services Available for Guidance and Support	%	%
Self-advocacy skills	24	78
Summer orientation program	32	41
Faculty mentors	22	79
Counseling services	43	57
Financial Support Opportunities	%	%
Disability specific scholarships	50	50
Graduate fellowship or assistantship not contingent on course load requirement	28	72
Graduate fellowship or assistantship not contingent on standardized test score	24	76
Accommodation for Program Requirements	%	%
Reduce course-load	32	65
Extended-time to complete degree requirements	22	78
Course waiver	33	67
Course substitution	30	70
Accommodation for Course Registration and Scheduling	%	%
Priority registration	71	29
Early registration	62	38
Priority course scheduling	74	26
Modified schedule	67	34
Withdrawing from a course after the usual cut-off date	61	39
Accommodation for Transition to Employment	%	%
Transfer supports to post-graduate employment	30	70
School-to-work programs	21	79
Internships and job training	30	70
Learning to use assistive technology devices specific to employment	26	74

Table 4-8. Frequency comparison of instructional supports provided by group

Instructional Support Measures	Undergraduate Students	Graduate Students
Accommodation for Class Lectures	%	%
Preferential seating	25	78
Changing the delivery of instruction	22	78
Review of Lecture	23	77
Review of assignments	34	66
Explain or clarify Directions	43	58
Accommodation for Class Notes	%	%
Copies of overhead or notes	28	71
Outlines of lectures	31	69
Writing key concepts and assignments on the board	45	55
Note takers	42	58
Tape record lectures	40	62
Accommodation for Class Assignments	%	%
Comment on draft of papers	61	39
Extra credit assignments	29	71
Allowing tape recording of assignments rather than written assignments	21	77
Provide additional time to complete assignment	31	69
Complete an assignment in alternative format	14	86
Use of proofreader	23	77
Allowing misspellings, incorrect grammar or punctuation	89	89
Accommodation for Reading and Writing	%	%
Readers	6	94
Taped reading materials	8	92
Reading center	12	88
Scribe	8	92
Specialized writing instruction	32	68
Writing center	42	58
Services and Resources Available for Academic Development	%	%
Development of study skills	30	70
Time management	29	71
Learning strategies	23	77
Subject tutoring	36	64
One-to-one assistance	14	77
Assistive Technology Accommodation	%	%
Learning to use computer software	52	77
Use of calculator	27	74
Use of word processor	37	63
Use of spell checker	30	70

Table 4-8. Continued

Instructional Support Measures	Undergraduate Students	Graduate Students
Communicating with instructor via e-mail	32	62
Access to assistive technology lab	46	55
Access to staff trained in assistive technology	39	61
Access to specialized software	31	69
Assistive technology loan program	27	73

Table 4-9. Frequency comparison of examination supports provided by group

Examination Support Measures	Undergraduate Students	Graduate Students
Testing and Exam Accommodation	%	%
Extended-time on exams	90	81
Take exams in a quiet room with proctor	6	94
Frequent breaks during exam	8	92
More frequent exams covering less amounts of material	22	78
Allowing to answer oral rather than written questions	7	93
Use of multiple-choice questions rather than essay questions	28	72
Tape recording responses to exam questions	4	96
Test questions worded in a simplified manner	27	73
Replacing the lowest score with a paper	19	81
Assist in preparing of Exams	28	72
Offer partial credit for using correct processes in math	22	78

Table 4-10. Frequency comparison of administrative supports provided by group

Administrative Support Measures	Undergraduate Students	Graduate Students
Services Available for Guidance and Support	%	%
Self-advocacy skills	47	53
Summer orientation program	40	60
Faculty mentors	38	63
Counseling services	48	52
Financial Support Opportunities	%	%
Disability specific scholarships	17	82
Graduate fellowship or assistantship not contingent on course load requirement	47	53
Graduate fellowship or assistantship not contingent on standardized test score	21	79
Accommodation for Program Requirements	%	%
Reduce course-load	22	78
Extended-time to complete degree requirements	15	85
Course waiver	18	81
Course substitution	8	92
Accommodation for Course Registration and Scheduling	%	%
Priority registration	30	70
Early registration	22	78
Priority course scheduling	23	77
Modified schedule	19	81
Withdrawing from a course after the usual cut-off date	11	89
Accommodation for Transition to Employment	%	%
Transfer supports to post-graduate employment	34	66
School-to-work programs	23	77
Internships and job training	34	66
Learning to use assistive technology devices specific to employment	12	88

Instructional Supports

Pearson correlation coefficients were obtained for undergraduate students' results for the needed and provided instructional supports as follows: (a) class lectures, (b) class notes, (c) class assignments, (d) reading and writing, (e) services and resources available for academic development, and (f) assistive technology.

Table 4-11. Correlation matrix for undergraduate students needed and provided supports for class lectures

		Provided				
		Pref Seat	Del Instr	Rev Lec	Rev Assig	Exp Direct
Needed	Preferential Seating	.102				
	Delivery of Instruction	.168	.251**			
	Review of Lecture		.001	.083		
	Review of Assignments			.266	.062	
	Explain Directions					.093
						.208

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-12. Correlation matrix for undergraduate students needed and provided supports for class notes

		Provided				
		Notes	Out-Line	Writ Con	Note Tak	Tape Rec
Needed	Notes	.214**				
	Outline of Lecture	.004	.183*			
	Written Concepts on the Board		.011	.243**		
	Note Takers			.001	.023	
	Tape record lectures				.755	
						-.005
						.951

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-13. Correlation matrix for undergraduate students needed and provided supports for class assignments

		Provided						
		Dra Pap	Ext Cre	Tape Rec	Add Tim	Co Asg	Use Pro	Allow Misspell
Needed	Draft of Papers	.042						
		.573						
	Extra Credit Assignments		.028 .718					
	Tape Recordings			-.061 .431				
	Additional Time/Complete Assignments				.076 .318			
	Complete Assig./ Alt. Format					.057 .455		
	Use Proofreader						.005 .952	
	Allow Misspelling							.037 .621

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-14. Correlation matrix for undergraduate students needed and provided supports for reading and writing

		Provided					
		Read	Tape Read	Read Cen	Scr	Writ Instr	Writ Cen
Needed	Readers	.355** .000					
	Tape Readings Reading Center Scribe		.624** .000				
				.345** .000			
					.512** .000		
	Writing Instruction					.352** .000	
	Writing Center						.526** .000

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-15. Correlation matrix for undergraduate students needed and provided supports for services and resources available for academic development

		Provided				
		Dev Skill	Tim Man	Learn Strat	Sub Tut	One Assist
Needed	Dev. Study Skills	.262**				
	Time Management	.001	.253**			
	Learning Strategies		.000	.245**		
	Subject Tutoring			.001	.232**	
	One-to-one Assistance				.002	.199**
						.009

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-16. Correlation matrix for undergraduate students needed and provided supports for assistive technology

		Provided									
		Com Soft	Use of Cal	Wor Proc	Spe Check	Instr Ema	Tec Lab	Tra Sta	Spe War	Tec Loan	
Needed	Computer Software	.141									
	Use of Calculator	.073	.220**								
	Word Processor		.006	.156							
	Spell Checker			.052	.158*						
	Instructor Email				.046	.091					
	Technology Lab					.262	.149				
	Trained Staff						.067	.093			
	Specialized Software							.262			
	Technology Loan								.177*		
									.032		
										-	
										.209*	
										.014	

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Examination Supports

Pearson correlation coefficients were obtained for undergraduate students' results for the needed and provided examination supports as follows: (a) testing and exam.

Table 4-17. Correlation matrix for undergraduate students needed and provided supports for testing and exam

		Provided										
		Ext Tim	Proc	Freq Br	Freq Exa	Oral Que	Essa Que	Tape Rec	Simpl Word	Rep Low	Pre Exa	Part Cre
Needed	Extended Time	.109										
	Proctor	.176										
	Frequent Breaks		.083									
	Frequent Exams		.265	.014								
	Oral Questions			.865								
	Essay Questions				.040							
	Tape Recording				.597	.087						
	Simplified Words					.284						
	Replacing Low Score/Paper						.055					
	Preparing of Exams						.495					
	Partial Credit							.093				
								.256				
									.160*			
									.046			
										.156		
										.054		
										.090		
										.273		
											.153	
											.059	

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-18. Correlation matrix for undergraduate students needed and provided supports for services available for guidance and support

		Provided			
		Self Adv	Sum Ori	Fac Ment	Coun Serv
Needed	Self Advocacy	.430**			
	Summer Orientation	.000	.542**		
	Faculty Mentors		.000	.364**	
	Counseling Services			.000	.511**
					.000

** Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level.

Administrative Supports

Pearson correlation coefficients were obtained for undergraduate students' results for the needed and provided instructional supports as follows: (a) services available for guidance and

support (b) financial opportunities, (c) program requirements, (d) course registration and scheduling, and (e) transition and employment.

Table 4-19. Correlation matrix for undergraduate students needed and provided financial support opportunities

		Provided		
		Dis Sch	Red Cour Load	Std. Test
Needed	Disability	-.089		
	Scholarships	.291		
	Reduced Course Load		.006	
	Standardized Testing			.084
				.318

** Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level.

Table 4-20. Correlation matrix for undergraduate students needed and provided supports for program requirements

		Provided			
		Red Cour	Ext Degr Req	Cour Waiver	Cour Sub
Needed	Reduced Course-load	.523**			
	Extend Degree Requirements	.000	.430**		
	Course Waiver			.466**	
	Course Substitution			.000	.393**
					.000

** Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level.

Table 4-21. Correlation matrix for undergraduate students needed and provided supports for course registration and scheduling

		Provided				
		Pri Reg	Ear Reg	Prior Sch	Mod Sch	Cou With
Needed	Priority Registration	.435**				
	Early Registration	.000	.140			
	Priority Course Scheduling		.075	.130		
	Modified Schedule			.115		
	Course Withdrawal				-.178*	
					.023	
						.125
						.132

** Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level

Table 4-22. Correlation matrix for undergraduate students needed and provided supports for transition to employment

		Provided			
		Trans Supp Employ	Sch-Wor Prog	Intern/ Job Train	Assist Tech Employ
Needed	Transfer	.612**			
	Supports to Employ	.000			
	School- Work		.601**		
	Programs		.000		
	Internship/ Job			.619**	
	Training			.000	
	Assistive				.163
	Technology- Employment				.058

** Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level.

The Relationship Between the Educational Supports Needed and Provided for Graduate Students

Pearson correlation coefficients were obtained for graduate students' results of each needed and provided educational supports - instructional, examination, and administrative - to examine the strength and linear relationship between the supports. Correlation coefficients yielded several significant relationships. The correlation matrix for the graduate students' measures is reported in Table 4-23 through 4-34.

Instructional Supports

Pearson correlation coefficients were obtained for graduate students' results for the needed and provided instructional supports as follows: (a) class lectures, (b) class notes, (c) class assignments, (d) reading and writing, (e) services and resources available for academic development, and (f) assistive technology.

Table 4-23. Correlation matrix for graduate students needed and provided supports for class lectures

		Provided				
		Pref Seat	Del Instr	Rev Lec	Rev Assig	Exp Direct
Needed	Preferential Seating	.010 .963				
	Delivery of Instruction		.134 .524			
	Review of Lecture			.055 .796		
	Review of Assignments				.234 .251	
	Explain Directions					.329 .100

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-24. Correlation matrix for graduate students needed and provided supports for class notes

		Provided				
		Notes	Out-Line	Writ Con	Note Tak	Tape Rec
Needed	Notes	.388 .050				
	Outline of Lecture		.333 .096			
	Written Concepts on the Board			.188 .359		
	Note Takers				.333 .096	
	Tape record lectures					.089 .664

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-25. Correlation matrix for graduate students needed and provided supports for class assignments

		Provided						
		Dra Pap	Ext Cre	Tape Rec	Add Tim	Co Asg	Use Pro	Allow Missp ell
Needed	Draft of Papers	.068						
	Extra Credit Assignments	.721	.289					
	Tape Recordings		.143					
	Additional Time/Complete Assignments			-.243				
	Complete Assig./ Alt. Format			.212	.053			
	Draft of Papers				.792			
	Extra Credit Assignments					-.147		
						.463		
							-.175	
							.392	

** Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-26. Correlation matrix for graduate students needed and provided supports for reading and writing

		Provided					
		Read	Tape Read	Read Cen	Scr	Writ Instr	Writ Cen
Needed	Readers	.295					
	Tape Readings	.096	.593**				
	Reading Center		.001	.440*			
	Scribe			.010	.525**		
	Writing Instruction				.007	.361*	
	Writing Center					.039	.361
							.076

**Correlations significant at the 0.01 level.

*Correlation significant at the 0.05 level.

Table 4-27. Correlation matrix for graduate students needed and provided supports for services and resources available for academic development

		Provided				
		Dev Skill	Tim Man	Learn Strat	Sub Tut	One Assist
Needed	Dev. Study Skills	.229				
		.250				
	Time Management		.229			
			.250			
	Learning Strategies			.030		
				.883		
	Subject Tutoring				.130	
					.527	
One-to-one Assistance					-.129	
					.540	

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-28. Correlation matrix for graduate students needed and provided supports for assistive technology

		Provided								
		Com Soft	Use of Cal	Wor Proc	Spe Check	Instr Ema	Tec Lab	Tra Sta	Spe War	Tec Loan
Needed	Computer Software	.497**								
		.008								
	Use of Calculator		.297							
			.117							
	Word Processor			.130						
				.527						
	Spell Checker				.271					
					.171					
	Instructor Email					.318				
						.114				
	Technology Lab						.320			
							.103			
	Trained Staff							.624**		
								.000		
	Specialized Software								.441*	
									.024	
	Technology Loan									.358
									.073	

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Examination Supports

Pearson correlation coefficients were obtained for graduate students' results for the needed and provided examination support measures as follows: (a) testing and exam.

Table 4-29. Correlation matrix for graduate and students needed and provided for testing and exam supports

		Provided											
		Ext Tim	Proc	Freq Br	Freq Exa	Oral Que	Essa Que	Tape Rec	Simpl Word	Rep Low	Pre Exa	Part Cre	
Needed	Extended Time	-.062											
	Proctor	.762	.124										
	Frequent Breaks		.499	-.068									
	Frequent Exams			.740	-.154								
	Oral Questions				.417	-							
	Essay Questions					.213	-.097						
	Tapre Recording					.268	.624	-.121					
	Simplified Words							.555	.186				
	Replacing Low								.353	.010			
	Score/Paper									.963			
	Preparing of Exams										-.029		
	Partial Credit										.890	-.189	
													.345

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Administrative Supports

Pearson correlation coefficients were obtained for graduate students' results for the needed and provided instructional supports as follows: (a) services available for guidance and support (b) financial opportunities, (c) program requirements, (d) course registration and scheduling, and (e) transition and employment.

Table 4-30. Correlation matrix for graduate students needed and provided supports for services available for guidance and support

		Provided			
		Self Adv	Sum Ori	Fac Ment	Coun Serv
Needed	Self	.498**			
	Advocacy	.004			
	Summer Orientation		.665**		
	Faculty Mentors		.000	.487**	
	Counseling Services			.005	.634**
					.001

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-31. Correlation matrix for graduate students needed and provided financial support opportunities

		Provided		
		Dis Sch	Red Cour Load	Std. Test
Needed	Disability	.093		
	Scholarships	.637		
	Reduced Course Load		.022	
	Standardized Testing		.914	-.037
				.850

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-32. Correlation matrix for graduate students needed and provided supports for program requirements

		Provided			
		Red Cour	Ext Degr Req	Cour Waiver	Cour Sub
Needed	Reduced Course-load	.527**			
	Extend Degree Requirements	.002	.222		
	Course Waiver		.276	.545**	
	Course Substitution			.001	.184
					.367

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-33. Correlation matrix for graduate students needed and provided supports for course registration and scheduling

		Provided				
		Pri Reg	Ear Reg	Prior Sch	Mod Sch	Cou With
Needed	Priority Registration	.238				
	Early Registration	.231	.478*			
	Priority Course Scheduling		.012	-.300		
	Modified Schedule			.136		
	Course Withdrawal				.227	
					.256	
						-.198
						.333

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Table 4-34. Correlation matrix for graduate students needed and provided supports for transition to employment

		Provided			
		Trans Supp Employ	Sch-Wor Prog	Intern/ Job Train	Assist Tech Employ
Needed	Transfer Supports to Employ	.786**			
	School- Work Programs	.000	.321		
	Internship/ Job Training		.126	.641**	
	Assistive Technology- Employment			.000	.339
					.114

**Correlations significant at the 0.01 level.

* Correlation significant at the 0.05 level.

Independent Sample Comparison of Educational Supports Needed for Undergraduate and Graduate Students

Data were analyzed to determine if any statistically significant differences existed between the various types of educational supports needed by undergraduate and graduate students with LD on any of the instructional, examination, and administrative supports. This section includes the results achieved.

The means of the undergraduate students group and graduate students group with LD were calculated. A series of *t*-tests were conducted for each type of educational support and a comparison was made to determine if any group differences existed. In the following section findings will be reported with undergraduate students' means, followed by graduate students' means. The results of the *t*-tests for each educational supports are provided in Tables 4-35 through 4-37.

Table 4-35. Independent sample comparison of instructional supports needed by group

Instructional Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Accommodation for Class Lectures									
Preferential seating	(229)	1.76	(.431)	(37)	1.84	(.374)	-1.098	264	.273
Changing the delivery of instruction	(190)	1.54	(.500)	(26)	1.77	(.430)	-2.258	214	.025*
Review of Lecture	(225)	1.75	(.436)	(37)	1.84	(.374)	-1.201	260	.231
Review of assignments	(181)	1.76	(.427)	(27)	1.93	(.267)	-1.933	206	.055
Explain or clarify directions	(224)	1.56	(.498)	(37)	1.76	(.435)	-2.288	259	.023*
Accommodation for Class Notes	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Copies of overhead or Notes	(223)	1.40	(.491)	(36)	1.56	(.504)	-1.768	257	0.78
Outlines of lectures	(198)	1.36	(.482)	(29)	1.45	(.482)	-.877	225	.381
Writing key concepts and assignments on the board	(222)	1.45	(.499)	(36)	1.64	(.487)	-2.058	256	-.18*
Note takers	(190)	1.49	(.501)	(29)	1.6	(.484)	-1.613	217	.108
Tape record lectures	(219)	1.53	(.501)	(36)	1.69	(.467)	-1.898	253	.059
Accommodation for Class Assignments	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Comment on draft of papers	(211)	1.58	(.495)	(36)	1.78	(.422)	-2.281	245	0.23*
Extra credit assignments	(177)	1.56	(.497)	(28)	1.71	(.460)	-1.91	203	.138
Allowing tape recording of assignments rather than written assignments	(211)	1.51	(.501)	(37)	1.81	(.397)	-3.443	246	.001*
Provide additional time to complete assignment	(178)	1.76	(.426)	(27)	1.93	(.267)	-1.917	203	.057
Complete an assignment in alternative format	(212)	1.89	(.312)	(36)	1.89	(.319)	.046	246	.963
Use of proofreader	(171)	1.83	(.376)	(26)	1.92	(.272)	-1.207	195	.229
Allowing misspellings, incorrect grammar or punctuation	(215)	1.36	(.488)	(38)	1.37	(.489)	-.066	251	.947

Table 4-35. Continued

Accommodation for Reading and Writing	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Readers	(202)	1.82	(.388)	(33)	1.88	(.331)	-0.867	233	.387
Taped reading materials	(166)	1.63	(.484)	(26)	1.81	(.402)	-1.753	190	.081
Reading center	(201)	1.66	(.474)	(34)	1.74	(.448)	-0.843	233	.400
Scribe	(175)	1.58	(.495)	(27)	1.74	(.447)	-1.563	200	.120
Specialized writing instruction	(200)	1.82	(.385)	(33)	1.88	(.331)	-0.827	231	.409
Writing center	(163)	1.66	(.474)	(26)	1.88	(.327)	-2.726	187	.007*
Services and Resources Available for Academic Development	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Development of study skills	(202)	1.50	(.501)	(35)	1.47	(.500)	-1.987	235	0.48*
Time management	(177)	1.47	(.500)	(28)	1.68	(.476)	-2.073	203	.039*
Learning strategies	(204)	1.50	(.501)	(35)	1.66	(.476)	-1.723	237	.086
Subject tutoring	(175)	1.49	(.501)	(28)	1.75	(.441)	-2.573	201	.011*
One-to-one assistance	(203)	1.49	(.501)	(34)	1.68	(.475)	-2.048	235	.042*
Assistive Technology Accommodation	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Learning to use computer software	(193)	1.81	(.395)	(33)	1.64	(.489)	2.229	224	.027*
Use of calculator	(160)	1.63	(.484)	(29)	1.66	(.484)	-.245	187	.807
Use of word processor	(193)	1.57	(.496)	(33)	1.79	(.415)	-2.382	224	.018*
Use of spell checker	(166)	1.50	(.502)	(27)	1.63	(.492)	-1.249	191	.213
Communicating with instructor via e-mail	(192)	1.62	(.487)	(33)	1.76	(.435)	-1.524	223	.129
Access to assistive technology lab	(159)	1.49	(.501)	(27)	1.59	(.501)	-.978	184	.330
Access to staff trained in assistive technology	(192)	1.57	(.496)	(33)	1.73	(.452)	-1.672	223	.96
Access to specialized software	(159)	1.49	(.501)	(27)	1.49	(.501)	-.622	184	.535
Assistive technology loan program	(192)	1.44	(.497)	(33)	1.58	(.502)	-1.473	223	.142

* Statistically significant at the 0.05 level

Table 4-36. Independent sample comparison of examination supports needed by group

Examination Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Testing and Exam Accommodation	(197)	1.06	(.240)	(35)	1.11	(.323)	-1.098	264	.273
Extended-time on Exams	(198)	1.05	(.209)	(34)	1.18	(.387)	-2.258	214	.025*
Take exams in a quiet room with proctor	(192)	1.17	(.374)	(35)	1.34	(.482)	-1.201	260	.231
Frequent breaks during exam	(185)	1.08	(.274)	(32)	1.44	(.504)	-1.933	206	.055
More frequent exams covering less amounts of material	(189)	1.71	(.453)	(33)	1.64	(.489)	.901	220	.368
Allowing to answer oral rather than written questions	(158)	1.92	(.276)	(28)	1.86	(.356)	.698	185	.486
Use of multiple-choice questions rather than essay questions	(189)	1.63	(.483)	(34)	1.74	(.448)	-1.128	221	.261
Tape recording responses to exam questions	(158)	1.92	(.276)	(28)	1.86	(.356)	1.023	184	.308
Test questions worded in a simplified manner	(189)	1.79	(.406)	(33)	1.82	(.392)	-.322	220	.748
Replacing the lowest score with a paper	(157)	1.88	(.327)	(26)	1.85	(.368)	.465	181	.642
Assist in preparing of Exams	(188)	1.68	(.467)	(32)	1.88	(.336)	-2.251	218	.025*
Offer partial credit for using correct processes in math									

* Statistically significant at the 0.05 level.

Table 4-37. Independent sample comparison of administrative supports needed by group

Administrative Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Services Available for Guidance and Support	(181)	1.76	(.430)	(32)	1.59	(.499)	1.930	211	.055
Self-advocacy skills	(150)	1.68	(.468)	(27)	1.78	(.412)	.136	175	.892
Summer orientation program	(181)	1.78	(.412)	(31)	1.74	(.445)	.525	210	.600
Faculty mentors	(152)	1.57	(.496)	(26)	1.77	(.430)	-1.903	176	.059
Counseling services									
Financial Support Opportunities	(181)	1.49	(.501)	(32)	1.72	(.448)	-.707	212	.480
Disability specific scholarships	(156)	1.72	(.448)	(26)	1.92	(.272)	-2.191	180	.030*
Graduate fellowship or assistantship not contingent on course load requirement									

Table 4-37. Continued

Administrative Support Measures	Undergraduate Students			Graduate Students					
Graduate fellowship or assistantship not contingent on standardized test score	(173)	1.76	(.430)	(32)	1.50	(.508)	3.019	203	.003*
Accommodation for Program Requirements	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Reduce course-load	(182)	1.65	(.479)	(33)	1.61	(.496)	.467	213	.643
Extended-time to complete degree requirements	(157)	1.78	(.418)	(29)	1.72	(.455)	.618	184	.537
Course waiver	(180)	1.67	(.471)	(33)	1.55	(.506)	1.406	211	.161
Course substitution	(151)	1.70	(.462)	(28)	1.79	(.418)	-.964	177	.336
Accommodation for Course Registration and Scheduling	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Priority registration	(188)	1.29	(.456)	(33)	1.79	(.415)	-5.827	219	.000*
Early registration	(172)	1.38	(.486)	(28)	1.64	(.488)	-2.672	198	.008*
Priority course scheduling	(184)	1.26	(.437)	(32)	1.75	(.440)	-5.900	214	.000*
Modified schedule	(170)	1.34	(.476)	(28)	1.64	(.488)	-3.099	196	.002*
Withdrawing from a course after the usual cut-off date	(186)	1.39	(.490)	(32))	1.78	(.420)	-4.230	216	.000*
Accommodation for Transition to Employment	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Transfer supports to post-graduate employment	(175)	1.70	(.485)	(31)	1.68	(.475)	.283	204	.777
School-to-work programs	(139)	1.79	(.408)	(24)	1.83	(.381)	-.470	161	.639
Internships and job training	(173)	1.70	(.460)	(31)	1.74	(.445)	-4.76	202	.634
Learning to use assistive technology devices specific to employment	(140)	1.74	(.439)	(24)	1.92	(.282)	-1.873	162	.063

*Statistically significant at the 0.05 level.

Independent Sample Comparison of Educational Supports Provided for Undergraduate and Graduate Students

The data were analyzed to determine if any statistically significant differences existed for the various types of educational supports needed between undergraduate and graduate students with LD on any of the instructional, examination, and administrative supports. This section includes the results.

The means of the undergraduate students' group and graduate students' group with LD were calculated. A series of *t*-tests were conducted for each type of educational support and a comparison was made to determine if any group differences existed. In the following section findings will be reported with undergraduate students means, followed by graduate student means in parenthesis. The results of the *t*-tests for each educational support are provided in Table 4-38 through Table 4-40.

Table 4-38. Independent sample comparison of instructional supports provided by group

Instructional Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Accommodation for Class Lectures	(188)	1.63	(.485)	(27)	1.78	(.424)	-1.527	213	.128
Preferential seating	(224)	1.62	(.486)	(37)	1.78	(.417)	-1.927	259	.055
Changing the delivery of instruction	(187)	1.75	(.436)	(26)	1.77	(.417)	-1.081	211	.281
Review of Lecture	(225)	1.61	(.489)	(38)	1.66	(.481)	-.573	261	.567
Review of assignments	(190)	1.58	(.495)	(28)	1.57	(.504)	.075	216	.940
Explain or clarify directions	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Accommodation for Class Notes	(179)	1.56	(.498)	(28)	1.71	(.498)	-1.553	205	.122
Copies of overhead or Notes	(222)	1.53	(.500)	(36)	1.69	(.467)	-1.879	256	.061
Outlines of lectures	(193)	1.36	(.481)	(29)	1.55	(.506)	-2.015	220	.045*
Writing key concepts and assignments on the board	(222)	1.68	(.469)	(36)	1.58	(.469)	1.085	256	.279
Note takers	(191)	1.59	(.493)	(29)	1.62	(.493)	-.296	218	.768
Tape record lectures	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	p
Accommodation for Class Assignments	(195)	1.38	(.488)	(33)	1.39	(.496)	-1.01	226	.919
Comment on draft of papers	(211)	1.76	(.426)	(35)	1.71	(.458)	.620	244	.536
Extra credit assignments									

Table 4-38. Continued

Instructional Support Measures	Undergraduate Students			Graduate Students					
Allowing tape recording of assignments rather than written assignments	(176)	1.81	(.391)	(28)	1.79	(.418)	.333	202	.739
Provide additional time to complete assignment	(210)	1.59	(.493)	(36)	1.69	(.467)	-1.178	244	.240
Complete an assignment in alternative format	(174)	1.68	(.466)	(28)	1.86	(.356)	-1.878	200	.062
Use of proofreader	(213)	1.65	(.479)	(35)	1.77	(.426)	-1.436	246	.152
Allowing misspellings, incorrect grammar or punctuation	(180)	1.78	(.413)	(27)	1.89	(.320)	-1.271	205	.205
Accommodation for Reading and Writing	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	<i>p</i>
Readers	(198)	1.88	(.327)	(33)	1.94	(.242)	-1.018	229	.310
Taped reading materials	(162)	1.71	(.455)	(26)	1.92	(.272)	-2.319	186	.021*
Reading center	(199)	1.82	(.386)	(33)	1.88	(.331)	-.838	230	.403
Scribe	(164)	1.71	(.454)	(25)	1.92	(.277)	-2.212	187	0.28*
Specialized writing instruction	(201)	1.63	(.484)	(34)	1.68	(.475)	-.499	233	.618
Writing center	(172)	1.38	(.486)	(26)	1.58	(.504)	-1.936	196	.054
Services and Resources Available for Academic Development	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	<i>p</i>
Development of study skills	(202)	1.50	(.501)	(35)	1.69	(.471)	-2.123	198	0.35*
Time management	(177)	1.47	(.500)	(28)	1.68	(.476)	-3.512	237	.001*
Learning strategies	(204)	1.50	(.501)	(35)	1.66	(.482)	-3.096	206	.002*
Subject tutoring	(175)	1.49	(.501)	(28)	1.75	(.441)	-2.285	236	.023*
One-to-one assistance	(203)	1.49	(.501)	(34)	1.68	(.475)	-2.204	203	.029*
Assistive Technology Development	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)	<i>t</i>	df	<i>p</i>
Learning to use computer software	(168)	1.23	(.423)	(27)	1.48	(.509)	-2.758	193	.006*
Use of calculator	(190)	1.68	(.466)	(34)	1.74	(.448)	-.592	222	.554
Use of word processor	(159)	1.53	(.500)	(27)	1.63	(.492)	-.915	184	.362
Use of spell checker	(190)	1.74	(.442)	(33)	1.70	(.467)	.475	221	.635
Communicating with instructor via e-mail	(158)	1.58	(.496)	(26)	1.62	(.496)	-.376	182	.707
Access to assistive technology lab	(188)	1.84	(.367)	(33)	1.55	(.506)	4.002	219	.000*
Access to staff trained in assistive technology	(149)	1.72	(.451)	(28)	1.61	(.497)	1.174	175	.242
Access to specialized software	(180)	1.91	(.293)	(32)	1.69	(.471)	3.490	210	.001*
Assistive technology loan program	(141)	1.77	(.420)	(26)	1.73	(.452)	.466	165	.642

*Statistically significant at the 0.05 level.

Table 4-39. Independent sample comparison of examination supports provided by group

Examination Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Testing and Exam Accommodation	(157)	1.85	(.355)	(26)	1.81	(.402)	.598	181	.550
Extended-time on exams	(187)	1.87	(.341)	(32)	1.94	(.246)	-1.130	217	.260
Take exams in a quiet room with proctor	(152)	1.89	(.308)	(26)	1.92	(.272)	-.441	176	.660
Frequent breaks during exam	(188)	1.61	(.489)	(32)	1.78	(.420)	-1.841	218	.066
More frequent exams covering less amounts of material	(157)	1.88	(.327)	(29)	1.93	(.258)	-.811	184	.419
Allowing to answer oral rather than written questions	(188)	1.66	(.475)	(32)	1.72	(.457)	-.655	218	.513
Use of multiple-choice questions rather than essay questions	(155)	1.89	(.314)	(26)	1.96	(.196)	-1.121	179	.264
Tape recording responses to exam questions	(190)	1.61	(.489)	(33)	1.73	(.452)	-1.280	221	.202
Test questions worded in a simplified manner	(157)	1.76	(.426)	(26)	1.81	(.402)	-.485	181	.629
Replacing the lowest score with a paper	(185)	1.53	(.500)	(32)	1.72	(.457)	-1.997	215	.047*
Assist in preparing of Exams	(158)	1.75	(.436)	(27)	1.78	(.424)	-.342	183	.733
Offer partial credit for using correct processes in math									

* Statistically significant at the 0.05 level.

Table 4-40. Independent sample comparison of administrative supports provided by group

Administrative Support Measures	Undergraduate Students			Graduate Students			<i>t</i>	df	p
	(N)	Mean	(Std. Dev.)	(N)	Mean	(Std. Dev.)			
Services Available for Guidance and Support									
Self-advocacy skills	(182)	1.63	(.485)	(32)	1.53	(.507)	1.016	212	.311
Summer orientation program	(152)	1.56	(.498)	(25)	1.60	(.500)	-.379	175	.705
Faculty mentors	(183)	1.55	(.499)	(32)	1.63	(.492)	-.823	213	.411
Counseling services	(161)	1.35	(.480)	(27)	1.52	(.509)	-1.684	186	.104
Financial Support Opportunities									
Disability specific scholarships	(146)	1.86	(.501)	(28)	1.82	(.390)	.470	172	.639
Graduate fellowship or assistantship not contingent on course load requirement	(173)	1.76	(.426)	(32)	1.53	(.507)	2.739	203	.007*
Graduate fellowship or assistantship not contingent on standardized test score	(145)	1.86	(.346)	(28)	1.79	(.418)	1.032	171	.303
Accommodation for Program Requirements									
Reduce course-load	(180)	1.69	(.462)	(32)	1.78	(.420)	-.992	210	.322
Extended-time to complete degree requirements	(152)	1.81	(.394)	(26)	1.85	(.368)	-.446	176	.656
Course waiver	(180)	1.69	(.464)	(32)	1.81	(.397)	-1.416	210	.158
Course substitution	(154)	1.81	(.397)	(26)	1.92	(.272)	-1.455	178	.148
Accommodation for Course Registration and Scheduling									
Priority registration	(164)	1.49	(.501)	(27)	1.70	(.465)	-2.093	189	.038*
Early registration	(182)	1.65	(.477)	(32)	1.78	(.420)	-1.417	212	.158
Priority course scheduling	(152)	1.72	(.452)	(26)	1.77	(.430)	-.547	176	.585
Modified schedule	(181)	1.62	(.486)	(31)	1.81	(.402)	-1.975	210	.050
Withdrawing from a course after the usual cut-off date	(150)	1.84	(.368)	(26)	1.88	(.326)	-.580	174	.563
Accommodation for Transition to Employment									
Transfer supports to post-graduate employment	(140)	1.74	(.439)	(24)	1.92	(.282)	-1.018	207	.310
School-to-work programs	(177)	1.56	(.498)	(32)	1.66	(.483)	-1.010	169	.314
Internships and job training	(145)	1.67	(.472)	(26)	1.77	(.430)	1.102	202	.272
Learning to use assistive technology devices specific to employment	(172)	1.80	(.405)	(24)	1.88	(.338)	-.906	159	.366

* Statistically significant at the 0.05 level.

Chi-Square Comparison of Educational Supports Needed for Undergraduate and Graduate Students

Data were analyzed to determine if any statistically significant differences existed for the various types of educational supports needed between undergraduate and graduate students with

LD on any of the instructional, examination, and administrative supports. This section includes the results.

A series of Chi-square tests of independence were conducted for each type of educational support and a comparison was made between the undergraduate students' group and graduate students' group to determine if any group differences existed. The following section reports the number of undergraduate students, followed by the number of graduate student in parenthesis. The results of the Chi-square tests are provided in Table 4-41 through 4-43.

Table 4-41. Chi-Square comparison of instructional supports needed by group

Instructional Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Accommodation for Class Lectures	(229)	62	(37)	204	1.209	.271
Preferential seating	(190)	94	(26)	216	5.025	.025*
Changing the delivery of instruction	(225)	63	(37)	199	1.446	.229
Review of Lecture	(181)	45	(27)	163	3.704	.054
Review of Assignments	(224)	108	(37)	153	5.170	.023*
Explain or clarify directions	(N)	Student Count	(N)	Student Count	χ^2	p
Accommodation for Class Notes	(223)	150	(36)	109	3.113	.078
Copies of overhead or Notes	(198)	142	(89)	85	.774	.379
Outlines of lectures	(222)	134	(36)	124	4.198	.040*
Writing key concepts and assignments on the board	(190)	106	(29)	113	2.593	.107
Note takers	(219)	115	(36)	140	3.580	.058
Tape record lectures	(N)	Student Count	(N)	Student Count	χ^2	p
Accommodation for Class Assignments	(211)	97	(36)	150	5.136	.023*
Comment on draft of papers	(177)	85	(28)	120	2.221	.136
Extra credit assignments	(211)	110	(37)	138	11.400	.001*
Allowing tape recording of assignments rather than written assignments	(178)	44	(27)	161	3.645	.056
Provide additional time to complete assignment	(212)	27	(32)	221	.002	.963
Complete an assignment in alternative format	(171)	31	(26)	166	1.462	.227
Use of proofreader	(215)	161	(38)	92	.004	.947
Allowing misspellings, incorrect grammar or punctuation						

Table 4-41. Continued

Accommodation for Reading and Writing	(N)	Student Count	(N)	Student Count	χ^2	p
Readers	(202)	41	(33)	194	.756	.385
Taped reading materials	(166)	66	(26)	126	3.057	.080
Reading center	(201)	77	(34)	158	.715	.398
Scribe	(175)	80	(27)	122	2.438	.118
Specialized writing instruction	(200)	40	(33)	193	.688	.407
Writing center	(163)	57	(26)	132	7.224	.007*
Services and Resources Available for Academic Development	(N)	Student Count	(N)	Student Count	χ^2	p
Development of study skills	(202)	111	(35)	126	3.915	.048*
Time management	(177)	103	(28)	102	4.250	.039*
Learning strategies	(204)	114	(35)	125	2.957	.085
Subject tutoring	(175)	96	(28)	107	6.474	.011*
One-to-one assistance	(203)	115	(34)	122	4.155	.042*
Assistive Technology Development	(N)	Student Count	(N)	Student Count	χ^2	p
Learning to use computer software	(193)	49	(33)	177	4.906	.027*
Use of calculator	(160)	69	(29)	120	.061	.806
Use of word processor	(193)	90	(33)	136	5.585	.018*
Use of spell checker	(166)	93	(27)	100	1.563	.211
Communicating with instructor via e-mail	(192)	81	(33)	144	2.320	.128
Access to assistive technology lab	(159)	92	(27)	94	.961	.327
Access to staff trained in assistive technology	(192)	91	(33)	134	2.785	.095
Access to specialized software	(159)	93	(27)	93	.390	.532
Assistive technology loan program	(192)	122	(33)	103	2.169	.141

* Statistically significant at the 0.05 level.

Table 4-42. Chi-Square comparison of examination supports needed by group

Examination Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Accommodation for Testing and Exam						
Extended-time on exams	(197)	216	(35)	16	1.318	.251
Take exams in a quiet room with proctor	(198)	217	(34)	15	8.236	.004*
Frequent breaks during exam	(192)	183	(35)	44	5.881	.015*
More frequent exams covering less amounts of material	(185)	188	(32)	29	29.933	.000*
Allowing to answer oral Rather than written questions	(189)	66	(33)	156	.817	.366
Use of multiple-choice questions rather than essay questions	(159)	50	(28)	137	.491	.483
Tape recording responses to exam questions	(189)	78	(34)	145	1.277	.259
Test questions worded in a simplified manner	(158)	17	(28)	169	1.051	.305
Replacing the lowest score with a paper	(189)	45	(33)	177	.105	.746
Assist in preparing of exams	(157)	23	(26)	160	.219	.640
Offer partial credit for using correct processes in math problems	(188)	64	(32)	156	4.997	.025*

* Statistically significant at the 0.05 level.

Table 4-43. Chi-Square comparison of administrative supports needed by group

Administrative Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Services Available for Guidance and Support	(N)	Student Count	(N)	Student Count	χ^2	p
Self-advocacy skills	(181)	57	(32)	156	3.693	.055
Summer orientation program	(150)	57	(27)	120	.019	.891
Faculty mentors	(181)	47	(31)	165	.278	.598
Counseling services	(152)	71	(26)	107	3.589	.058
Financial Support Opportunities	(N)	Student Count	(N)	Student Count	χ^2	p
Disability specific scholarships	(182)	106	(32)	108	.503	.478
Graduate fellowship or assistantship not contingent on course load requirement	(156)	45	(26)	137	4.728	.030*
Graduate fellowship or assistantship not contingent on standardized test score	(173)	58	(32)	147	8.807	.003*
Accommodation for Program Requirements	(N)	Student Count	(N)	Student Count	χ^2	p
Reduce course-load	(182)	77	(33)	138	.217	.641
Extended-time to complete degree requirements	(157)	43	(29)	143	.386	.534
Course waiver	(180)	74	(33)	139	1.977	.160
Course substitution	(151)	52	(28)	127	.935	.333
Accommodation for Course Registration and Scheduling	(N)	Student Count	(N)	Student Count	χ^2	p
Priority registration	(188)	140	(33)	81	29.664	.000*
Early registration	(172)	117	(28)	83	6.963	.008*
Priority course scheduling	(184)	145	(32)	71	30.216	.000*
Modified schedule	(170)	122	(28)	76	9.251	.002*
Withdrawing from a course after the usual cut-off date	(186)	120	(32)	98	16.677	.000*
Accommodation for Transition to Employment	(N)	Student Count	(N)	Student Count	χ^2	p
Transfer supports to post-graduate employment	(175)	62	(31)	144	.081	.776
School-to-work programs	(139)	33	(24)	130	.223	.637
Internships and job training	(173)	60	(31)	144	.229	.632
Learning to use assistive technology devices specific to employment	(140)	38	(24)	126	3.477	.062

* Statistically significant at the 0.05 level.

Chi-Square Comparison of Educational Supports Provided for Undergraduate and Graduate Students

Data were analyzed to determine if any statistically significant differences existed for the various types of educational supports provided between undergraduate and graduate students with LD on any of the instructional, examination, and administrative supports. This section includes the results.

A series of Chi-square tests of independence were conducted for each type of educational support and a comparison was made between the undergraduate students' group and graduate students' group to determine if any group differences existed. The following section reports the number of undergraduate students, followed by the number of graduate student in parenthesis. The results of the Chi-square tests for each educational support are provided in Table 4-44 through 4-46.

Table 4-44. Chi-square comparison of instructional supports provided by group

Instructional Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Accommodation for Class Lectures						
Preferential seating	(188)	76	(27)	139	2.328	.127
Changing the delivery of instruction	(224)	93	(37)	168	3.690	.055
Review of Lecture	(187)	69	(26)	144	1.174	.279
Review of Assignments	(225)	101	(38)	162	.330	.566
Explain or clarify Directions	(190)	92	(28)	126	.006	.940
Accommodation for Class Notes						
Copies of overhead or Notes	(179)	87	(28)	120	2.407	.121
Outlines of lectures	(222)	116	(36)	142	3.509	.061
Writing key concepts and assignments on the board	(193)	137	(29)	85	4.025	.045*
Note takers	(222)	87	(36)	171	1.182	.277
Tape record lectures	(191)	89	(29)	131	.088	.766

Table 4-44. Continued

Accommodation for Class Assignments	(N)	Student Count	(N)	Student Count	χ^2	p
Comment on draft of papers	(195)	140	(33)	88	.010	.919
Extra credit assignments	(211)	60	(35)	186	.387	.534
Allowing tape recording of assignments rather than written assignments	(176)	39	(28)	165	.112	.738
Provide additional time to complete assignment	(210)	97	(36)	149	1.391	.238
Complete an assignment in alternative format	(174)	59	(28)	143	3.501	.061
Use of proofreader	(213)	83	(35)	165	2.060	.151
Allowing misspellings, incorrect grammar or punctuation	(180)	42	(27)	165	1.617	.203
Accommodation for Reading and Writing	(N)	Student Count	(N)	Student Count	χ^2	p
Readers	(198)	26	(33)	205	1.040	.308
Taped reading materials	(162)	49	(26)	139	5.285	.022*
Reading center	(199)	40	(33)	192	.707	.400
Scribe	(164)	49	(25)	140	4.821	.028*
Specialized writing instruction	(201)	85	(34)	150	.251	.616
Writing center	(172)	118	(26)	80	3.715	.054
Services and Resources Available for Academic Development	(N)	Student Count	(N)	Student Count	χ^2	p
Development of study skills	(173)	97	(27)	103	4.450	.035*
Time management	(205)	135	(34)	104	11.821	.001*
Learning strategies	(182)	106	(26)	102	9.245	.002*
Subject tutoring	(205)	130	(33)	108	5.153	.023*
One-to-one assistance	(179)	88	(26)	117	4.789	.029*

Table 4-44. Continued

Assistive Technology Development	(N)	Student Count	(N)	Student Count	χ^2	p
Learning to use computer software	(168)	143	(27)	52	7.395	.007*
Use of calculator	(190)	69	(34)	155	.353	.552
Use of word processor	(159)	84	(27)	102	.842	.359
Use of spell checker	(190)	60	(33)	163	.227	.634
Communicating with instructor via e-mail	(158)	77	(26)	184	.143	.706
Access to assistive technology lab	(188)	45	(33)	176	15.063	.000*
Access to staff trained in assistive technology	(149)	53	(28)	177	1.384	.239
Access to specialized software	(180)	27	(32)	185	11.624	.001*
Assistive technology loan program	(141)	39	(26)	128	.219	.640

* Statistically significant at the 0.05 level.

Table 4-45. Chi-square comparison of examination supports provided by group

Examination Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Accommodation for Testing and Exam						
Extended-time on exams	(157)	28	(26)	155	.361	.548
Take exams in a quiet room with proctor	(187)	27	(32)	192	1.281	.258
Frequent breaks during exam	(152)	18	(26)	160	.196	.658
More frequent exams covering less amounts of material	(188)	80	(32)	140	3.397	.065
Allowing to answer oral Rather than written questions	(157)	21	(29)	165	.662	.416
Use of multiple-choice questions rather than essay questions	(188)	73	(32)	147	.432	.511
Tape recording responses to exam questions	(155)	18	(26)	181	1.261	.261
Test questions worded in a simplified manner	(190)	83	(33)	223	1.640	.200
Replacing the lowest score with a paper	(157)	42	(26)	141	.237	.626
Assist in preparing of exams	(185)	96	(32)	121	3.951	.047*
Offer partial credit for using correct processes in math problems	(158)	46	(27)	139	.118	.731

* Statistically significant at the 0.05 level.

Table 4-46. Chi-square comparison of administrative supports provided by group

Administrative Support Measures	Undergraduate Students		Graduate Students		χ^2	p
	(N)	Student Count	(N)	Student Count		
Services Available for Guidance and Support	(N)	Student Count	(N)	Student Count	χ^2	p
Self-advocacy skills	(182)	83	(32)	131	1.037	.308
Summer orientation program	(152)	77	(25)	100	.145	.703
Faculty mentors	(183)	95	(32)	120	.681	.409
Counseling services	(161)	117	(27)	188	2.662	.103
Financial Support Opportunities	(N)	Student Count	(N)	Student Count	χ^2	p
Disability specific scholarships	(146)	26	(28)	148	.223	.637
Graduate fellowship or assistantship not contingent on course load requirement	(173)	56	(32)	149	7.305	.007*
Graduate fellowship or assistantship not contingent on standardized test score	(145)	26	(28)	147	1.071	.301
Accommodation for Program Requirements	(N)	Student Count	(N)	Student Count	χ^2	p
Reduce course-load	(180)	62	(32)	150	.989	.320
Extended-time to complete degree requirements	(152)	33	(26)	145	.201	.654
Course waiver	(180)	62	(32)	150	2.006	.157
Course substitution	(154)	32	(26)	148	2.115	.146
Accommodation for Course Registration and Scheduling	(N)	Student Count	(N)	Student Count	χ^2	p
Priority registration	(164)	92	(27)	99	4.328	.037*
Early registration	(182)	70	(32)	144	2.007	.157
Priority course scheduling	(152)	49	(26)	129	.302	.582
Modified schedule	(181)	74	(31)	138	3.864	.049*
Withdrawing from a course after the usual cut-off date	(150)	27	(26)	149	.340	.560
Accommodation for Transition to Employment	(N)	Student Count	(N)	Student Count	χ^2	p
Transfer supports to post-graduate employment	(177)	89	(32)	120	1.041	.308
School-to-work programs	(145)	54	(26)	117	1.026	.311
Internships and job training	(172)	54	(32)	150	1.218	.270
Learning to use assistive technology devices specific to employment	(137)	31	(24)	130	.828	.363

* Statistically significant at the 0.05 level.

Supplemental Data Analyses

A series of Two-Way Analysis of Variance (ANOVA) were conducted to assess the main effects and interactions for each instructional, examination, and administrative support needed and provided across the nine institutions to determine if any statistically significant differences existed. The results of the *F*-tests for each educational support are presented in Table 4-47 through 4-52.

Table 4-47. Two-way ANOVA comparison of instructional supports needed by group

Instructional Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Accommodation for Class Lectures	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Preferential seating	(229)	1.76	(37)	1.84	.445	.445*	1.197	.302*	.991	.444
Changing the delivery of instruction	(190)	1.54	(26)	1.77	4.026	.046	1.197	.302*	.991	.444
Review of lecture	(225)	1.75	(37)	1.84	.708	.401*	1.412	.192*	2.020	.045*
Review of assignments	(181)	1.76	(27)	1.93	2.866	.092*	.669	.719*	.988	.009*
Explain or clarify directions	(224)	1.56	(37)	1.76	1.877	.172*	1.055	.396*	2.514	.012*
Accommodation for Class Notes	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Copies of overhead or notes	(223)	1.40	(36)	1.56	2.701	.102*	1.281	.254*	1.179	.312
Outlines of lectures	(198)	1.36	(29)	1.45	2.094	.102*	2.094	.038*	1.823	.074
Writing key concepts and assignments on the board	(222)	1.45	(36)	1.64	3.345	.069*	1.638	.115*	1.577	.132
Note takers	(190)	1.49	(29)	1.66	3.491	.063*	1.210	.295*	.830	.570
Tape record lectures	(219)	1.53	(36)	1.69	2.098	.149*	2.094	.038	1.189	.306
Accommodation for Class Assignments	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Comment on draft of papers	(211)	1.58	(36)	1.78	4.220	.041	.741	.655*	.245	.982
Extra credit assignments	(177)	1.56	(28)	1.71	1.669	.198*	1.184	.311*	1.294	.247
Allowing tape recording of assignments rather than written assignments	(211)	1.51	(37)	1.81	7.499	.007	2.483	.013	1.085	.375

Table 4-47. Continued

Instructional Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect	p	Main Effect	p	Inter-action	p
Provide additional time to complete assignment	(178)	1.76	(27)	1.93	1.726	.191*	.054	.961*	.080	.460
Complete an assignment in alternative format	(212)	1.89	(36)	1.89	.002	.961*	1.231	.282*	1.600	.126
Use of proofreader	(171)	1.83	(26)	1.92	.900	.344*	.563	.807*	.275	.973
Allowing misspellings, incorrect grammar or punctuation	(215)	1.36	(38)	1.37	.107	.744*	1.663	.108*	.507	.850
Accommodation for Reading and Writing	(N)	Mean	(N)	Mean	Main Effect	p	Main Effect	p	Inter-action	p
					A		B			
Readers	(202)	1.82	(33)	1.88	.988	.321*	1.030	.414*	.541	.825
Taped reading materials	(166)	1.63	(26)	1.81	3.501	.063*	.715	.678*	.863	.549
Reading center	(201)	1.66	(34)	1.74	.264	.608*	1.093	.369*	1.078	.379
Scribe	(175)	1.58	(27)	1.74	.738	.392*	3.178	.002	1.817	.076
Specialized writing instruction	(200)	1.82	(33)	1.88	.690	.407*	.410	.914*	.820	.586
Writing center	(163)	1.66	(26)	1.92	5.542	.020	.575	.798*	.303	.964
Services and Resources Available for Academic Development	(N)	Mean	(N)	Mean	Main Effect	p	Main Effect	p	Inter-action	p
					A		B			
Development of study skills	(202)	1.50	(35)	1.69	1.553	.214*	.722	.672*	.302	.965
Time management	(177)	1.47	(28)	1.68	2.342	.128*	.806	.598*	.570	.801
Learning strategies	(204)	1.50	(35)	1.66	.734	.392*	.863	.549*	.648	.728
Subject tutoring	(175)	1.49	(28)	1.75	4.677	.032	.569	.802*	.077	.965
One-to-one assistance	(203)	1.49	(34)	1.68	2.927	.089*	1.775	.083*	.472	.875
Assistive Technology Development	(N)	Mean	(N)	Mean	Main Effect	p	Main Effect	p	Inter-action	p
					A		B			
Learning to use computer software	(193)	1.81	(33)	1.64	2.674	.103*	1.555	.140	1.173	.317
Use of calculator	(160)	1.63	(29)	1.66	.491	.485*	.754	.643*	.347	.946

Table 4-47. Continued

Instructional Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
Use of word processor	(193)	1.57	(33)	1.79	4.676	.032	.922	.499*	.594	.782
Use of spell checker	(166)	1.50	(27)	1.63	1.732	.190*	.817	.588*	.474	.873
Communicating with instructor via e-mail	(192)	1.62	(33)	1.76	3.303	.071*	.583	.791*	.911	.509
Access to assistive technology lab	(149)	1.49	(27)	1.59	1.722	.191*	1.098	.367*	.542	.824
Access to staff trained in assistive technology	(192)	1.57	(33)	1.73	4.020	.046	.479	.870*	.904	.514
Access to specialized software	(159)	1.49	(27)	1.56	1.389	.240*	1.831	.074*	1.087	.375
Assistive technology loan program	(192)	1.44	(33)	1.58	.907	.342*	.772	.628*	.519	.841

* Statistically significant at the 0.05 level.

Table 4-48. Two-way ANOVA comparison of examination supports needed by group

Examination Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Interaction	p
Accommodation for Testing and Exam										
Extended-time on exams	(197)	1.06	(35)	1.11	1.062	.304*	1.681	.104*	.638	.706
Take exams in a quiet room with proctor	(198)	1.05	(34)	1.18	9.312	.003	1.929	.057	2.280	.023*
Frequent breaks during exam	(192)	1.17	(35)	1.34	2.570	.110*	2.414	.016	1.559	.139
More frequent exams covering less amounts of material	(185)	1.08	(32)	1.44	9.312	.003	3.068	.003	1.532	.148
Allowing to answer oral rather than written questions	(189)	1.71	(33)	1.64	.003	.957*	.928	.494*	1.362	.215
Use of multiple-choice questions rather than essay questions	(159)	1.74	(28)	1.68	.033	.856*	.463	.881*	.704	.688
Tape recording responses to exam questions	(189)	1.63	(34)	1.74	.954	.330*	1.570	.136*	.956	.472
Test questions worded in a simplified manner	(158)	1.92	(28)	1.86	.696	.405*	1.558	1.41*	1.385	.206
Replacing the lowest score with a paper	(189)	1.79	(33)	1.82	.001	.982*	1.822	.075*	2.280	.023*
Assist in preparing of exams	(157)	1.88	(26)	1.85	.051	.821*	1.189	.308*	.975	.485
Offer partial credit for using correct processes in math problems	(188)	1.68	(32)	1.88	2.371	.125*	.956	.472*	.277	.973

* Statistically significant at the 0.05 level.

Table 4-49. Two-way ANOVA comparison of administrative supports needed by group

Administrative Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Services Available for Guidance and Support	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Self-advocacy skills	(181)	1.76	(32)	1.59	2.413	.122*	1.078	.380*	1.157	.327
Summer orientation program	(150)	1.68	(27)	1.67	.220	.640*	.766	.633*	.792	.610
Faculty mentors	(181)	1.78	(31)	1.74	.259	.612*	1.035	.411*	1.200	.301
Counseling services	(152)	1.57	(26)	1.77	3.282	.072*	.805	.599*	.490	.862
Financial Support Opportunities	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Disability specific scholarships	(182)	1.49	(32)	1.56	.301	.584*	.455	.886*	.913	.507
Graduate fellowship or assistantship not contingent on course load requirement	(156)	1.72	(26)	1.92	2.667	.104*	.348	.946*	.248	.981
Graduate fellowship or assistantship not contingent on standardized test score	(173)	1.76	(32)	1.50	10.090	.002	1.884	.065*	1.522	.152
Accommodation for Program Requirements	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Reduce course-load	(182)	1.65	(33)	1.61	.938	.334*	1.312	.239*	.863	.549
Extended-time to complete degree requirements	(157)	1.78	(29)	1.72	.268	.605*	1.026	.418*	1.793	.082
Course waiver	(180)	1.67	(33)	1.55	3.679	.057*	2.359	.019	.897	.520
Course substitution	(151)	1.70	(28)	1.79	.931	.336*	.501	.854*	.681	.708

Table 4-49. Continued

Accommodation for Course Registration and Scheduling	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Interaction	p
Priority registration	(188)	1.29	(33)	1.79	18.757	.000	1.421	.189*	1.427	.187
Early registration	(172)	1.38	(28)	1.64	4.120	.044	4.890	.000	2.020	.046*
Priority course scheduling	(184)	1.26	(32)	1.75	.094	.760*	1.796	.080*	.989	.446
Modified schedule	(170)	1.34	(28)	1.64	14.393	.000	8.906	.000	2.365	.019*
Withdrawing from a course after the usual cut-off date	(186)	1.39	(32)	1.78	5.941	.016	1.590	.130*	1.184	.311
Accommodation for Transition to Employment	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Interaction	p
Transfer supports to post-graduate employment	(175)	1.70	(31)	1.68	.029	.886*	.568	.804*	.765	.634
School-to-work programs	(139)	1.79	(24)	1.89	.126	.723*	.742	.654*	.310	.961
Internships and job training	(173)	1.70	(31)	1.74	.388	.534*	.569	.803*	.519	.842
Learning to use assistive technology devices specific to employment	(140)	1.74	(26)	1.77	1.437	.233*	.558	.810*	.413	.912

*Statistically significant at the 0.05 level.

Table 4-50. Two-way ANOVA comparison of instructional supports provided by group

Instructional Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Accommodation for Class Lectures	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Preferential seating	(188)	1.63	(27)	1.78	1.314	.253*	1.929	.058*	.914	.506
Changing the delivery of instruction	(224)	1.62	(37)	1.78	1.266	.262*	1.289	.250*	1.480	.165
Review of Lecture	(187)	1.66	(26)	1.77	.337	.562*	.877	.537*	.555	.814
Review of Assignments	(225)	1.61	(38)	1.66	.631	.428*	1.947	.054*	1.830	.072
Explain or clarify directions	(190)	1.58	(28)	1.57	1.600	.207*	2.478	.014	1.360	.216
Accommodation for Class Notes	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Copies of overhead or Notes	(179)	1.56	(28)	1.71	1.752	.187*	1.849	.070*	.722	.672
Outlines of lectures	(222)	1.53	(36)	1.69	2.654	.105*	1.94	.368*	.939	.485
Writing key concepts and assignments on the board	(193)	1.36	(29)	1.55	4.871	.028	3.288	.001	.937	.487
Note takers	(222)	1.68	(36)	1.58	3.387	.067*	.867	.545*	.572	.801
Tape record lectures	(191)	1.59	(29)	1.62	.358	.550*	1.658	.111*	.566	.805
Accommodation for Class Assignments	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Comment on draft of papers	(195)	1.38	(33)	1.39	.050	.824*	2.451	.015	1.395	.200
Extra credit assignments	(211)	1.76	(35)	1.71	1.095	.296*	1.294	.247*	1.654	.111
Allowing tape recording of assignments rather than written assignments	(176)	1.81	(28)	1.79	.238	.626*	2.362	.019	1.817	.067
Provide additional time to complete assignment	(210)	1.59	(36)	1.69	2.042	.154*	1.330	.230*	.488	.864
Complete an assignment in alternative format	(174)	1.68	(28)	1.86	2.334	.128*	.395	.922*	.161	.996
Use of proofreader	(213)	1.65	(35)	1.77	2.911	.089*	1.053	.397*	.170	.643
Allowing misspellings, incorrect grammar or punctuation	(180)	1.78	(27)	1.89	2.349	.127*	.412	.913*	.672	.716

Table 4-50. Continued

Accommodation for Reading and Writing	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Readers	(198)	1.88	(33)	1.94	.377	.540*	.521	.840*	.640	.744
Taped reading materials	(162)	1.71	(26)	1.92	4.360	.038	.422	.906*	.451	.889
Reading center	(199)	1.82	(33)	1.88	1.183	.278*	.695	.696*	.709	.684
Scribe	(164)	1.71	(25)	1.92	3.701	.056*	.613	.766*	.452	.888
Specialized writing instruction	(201)	1.63	(34)	1.68	.158	.692*	1.753	.088*	.884	.531
Writing center	(172)	1.38	(26)	1.58	2.707	.102*	2.387	.018	.632	.750
Services and Resources Available for Academic Development	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Development of study skills	(173)	1.49	(27)	1.70	3.444	.065*	.902	.516*	.267	.976
Time management	(205)	1.39	(34)	1.71	10.588	.001	1.946	.055*	.500	.855
Learning strategies	(182)	1.45	(26)	1.77	6.939	.009	.709	.684*	.546	.821
Subject tutoring	(205)	1.42	(33)	1.64	3.895	.050*	1.365	.213*	.617	.763
One-to-one assistance	(179)	1.54	(26)	1.77	5.021	.026	.457	.885*	.344	.947
Assistive Technology Development	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Use of calculator	(190)	1.68	(34)	1.74	.155	.695*	1.060	.393*	1.798	.079
Use of word processor	(159)	1.53	(27)	1.63	1.351	.247*	.772	.627*	.689	.701
Use of spell checker	(190)	1.74	(33)	1.70	1.81	.671*	.791	.611*	.712	.681
Communicating with instructor via e-mail	(158)	1.58	(26)	1.62	.623	.431*	.686	.703*	.126	.998
Access to assistive technology lab	(188)	1.84	(33)	1.55	3.303	.071*	1.875	.066*	1.877	.065
Access to staff trained in assistive technology	(149)	1.72	(28)	1.61	.009	.924*	.566	.805*	.623	.758
Access to specialized software	(180)	1.91	(32)	1.69	10.012	.002	4.384	.000	3.428	.001*
Assistive technology loan program	(141)	1.77	(26)	1.73	.202	.654*	.559	.810*	.629	.752

*Statistically significant at the 0.05 level.

Table 4-51. Two-way ANOVA comparison of examination supports provided by group

Examination Support Measures	Undergraduate Students		Graduate Students		<i>F</i> -test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Accommodation for Testing and Exam										
Extended-time on exams	(157)	1.85	(26)	1.81	.225	.636*	2.504	.014*	1.469	.172
Take exams in a quiet room with proctor	(187)	1.87	(32)	1.94	.317	.574*	.508	.849*	.847	.563
Frequent breaks during Exam	(152)	1.89	(26)	1.92	.278	.599*	.402	.918*	.593	.782
More frequent exams covering less amounts of material	(188)	1.61	(32)	1.78	3.442	.062*	1.299	1.246*	.467	.878
Allowing to answer oral rather than written questions	(157)	1.88	(29)	1.93	1.587	.210*	.681	.708*	.914	.506
Use of multiple-choice questions rather than essay questions	(188)	1.66	(32)	1.72	.694	.406*	1.149	.332*	1.038	.409
Tape recording responses to exam questions	(155)	1.89	(26)	1.96	1.035	.310*	.320	.958*	.345	.947
Test questions worded in a simplified manner	(190)	1.61	(33)	1.73	1.719	.191*	2.437	.015	.933	.490
Replacing the lowest score with a paper	(157)	1.76	(26)	1.81	.343	.559*	.719	.674*	.517	.843
Assist in preparing of exams	(185)	1.53	(32)	1.72	2.107	.148*	2.237	.026	1.095	.368
Offer partial credit for using correct processes in math problems	(158)	1.75	(27)	1.78	2.02	.654*	1.910	.061*	.809	.595

*Statistically significant at the 0.05 level.

Table 4-52. Two-way ANOVA comparison of administrative supports provided by group

Administrative Support Measures	Undergraduate Students		Graduate Students		F-test					
	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Services Available for Guidance and Support	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Self-advocacy skills	(182)	1.63	(32)	1.53	1.644	.201*	1.261	.266*	.742	.655
Summer orientation program	(152)	1.56	(25)	1.60	1.124	.291*	.704	.687*	.395	.922
Faculty mentors	(183)	1.55	(32)	1.62	.259	.612*	1.035	.411*	1.200	.301
Counseling services	(161)	1.35	(27)	1.52	2.719	.101*	.544	.822*	.347	.946
Financial Support Opportunities	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Disability specific scholarships	(146)	1.86	(28)	1.85	.005	.946*	.758	.641*	.867	.546
Graduate fellowship or assistantship not contingent on course load requirement	(173)	1.76	(32)	1.53	14.629	.033	1.560	.063*	1.449	.179
Graduate fellowship or assistantship not contingent on standardized test score	(145)	1.86	(28)	1.79	.004	.952*	.515	.844*	.731	.646
Accommodation for Program Requirements	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Reduce course-load	(180)	1.69	(32)	1.78	1.077	.307*	1.755	.088*	.993	.442
Extended-time to complete degree requirements	(152)	1.81	(26)	1.85	.431	.513*	.476	.872*	.402	.918
Course waiver	(180)	1.69	(32)	1.81	1.382	.241*	1.687	.104*	1.169	.320
Course substitution	(154)	1.81	(26)	1.92	1.382	.241*	.633	.749*	.507	.850

*Statistically significant at the 0.05 level.

Table 4-52. Continued

Accommodation for Course Registration and Scheduling	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Priority registration	(164)	1.49	(27)	1.70	1.157	.284*	4.156	.000	.881	.534
Early registration	(182)	1.65	(32)	1.78	.094	.760*	1.796	.080*	.989	.446
Priority course scheduling	(152)	1.72	(26)	1.77	.037	.848*	2.018	.047	.768	.631
Modified schedule	(181)	1.62	(31)	1.81	3.947	.048	8.40	.568*	.729	.665
Withdrawing from a course after the usual cut-off date	(150)	1.84	(26)	1.88	.762	.384*	.323	.956*	.498	.856
Accommodation for Transition to Employment	(N)	Mean	(N)	Mean	Main Effect A	p	Main Effect B	p	Inter-action	p
Transfer supports to post-graduate employment	(177)	1.56	(32)	1.66	.557	.456*	1.609	.124*	.543	.823
School-to-work programs	(145)	1.67	(26)	1.77	1.130	.290*	1.716	.099*	.985	.450
Internships and job training	(172)	1.75	(32)	1.66	.194	.660*	1.191	.306*	1.240	.278
Learning to use assistive technology devices specific to employment	(137)	1.80	(24)	1.87	.742	.391*	.474	.873*	.520	.840

*Statistically significant at the 0.05 level.

Data Analysis of Open-Ended Questions

Open-ended questions consisting of student written responses were themed and categorized as follows: (a) students' perceptions of the types of educational supports offered at institutions; (b) students' perceptions of faculty attitudes toward educational supports; (c) students' perceptions of the types of educational supports found to be most beneficial for learning; (d) students' academic learning difficulties present prior to receiving educational support services; and (e) students' difficulties in obtaining educational support services and how educational supports have been helpful once received. Brackets and italics were used to clarify students' comments and ideas and

to clarify responses that were not clearly written. Brackets and italics were also used to conform to APA style.

Students' perceptions of the types of educational supports offered at institutions were twofold: students' described difficulties with seeking formal documentation of their LD to obtain educational supports and students described difficulties in receiving approval from disability services for the types of educational supports needed for completion of coursework and program requirements. First, students who were identified with LD in college expressed concern for having to seek formal diagnosis from a licensed psychologist prior to receiving educational support services. On the other hand, students who had prior documentation from high school (K-12) had to seek, once again, documentation of their LD. This occurred because assessment measures used in prior diagnoses did not meet criteria for postsecondary education based on federal definitions of adult learning disabilities. Similarly, students who transferred to four-year institutions from community colleges and had prior documentation of LD had to be retested to meet federal guidelines. A student commented:

[It is] very expensive to have the required documentation which my insurance does not cover. I requested testing in late October and was not scheduled to test until [the middle of] February. The [test results] took one month [to be returned to me], I [spent the] majority of my year waiting on a test. The accommodations did not come in time. It took a long process to get diagnosed and get accommodations.

Thus, students found being retested for a learning disability to be expensive, burdensome since they had to prove a history of their disability, and a long awaiting process. Also, students who transitioned from four-year institutions with prior diagnoses of LD explained that transferring to another four-year institution was challenging because educational supports varied across institutions. For example, at one four-year institution a student was able to take exams in a private room, free of distractions, but after transferring to another four-year institution he was required to

take exams in a secluded room with a group of students who had the same disability. A student explained:

I found going through the [*office of disability services*] in California at CSU San Marcos was much easier and cheaper than the accommodations at UA at Tuscaloosa. At UA I have to take my exams in a quiet room, but many times there are a lot of students taking the exam in their with me and I still get very distracted. At CSU San Marcos I was able to have my own private room to take exams. I think as a result of this and their extensive help [*that*] I felt more comfortable being a part of [*the office of disability services*] there. Another student commented: “[*Accommodations have been*] helpful, but LSU does not provide a lot of the accommodations and help that I had at other [*universities*].”

As a result, students felt that institutions offer the minimum educational supports available as provided by law.

Second, students expressed concerns about the difficulties of receiving approval from disability services for obtaining various types of educational supports. For instance, some students had to seek a professional advocate to represent their needs for specific types of educational supports. This was due to the fact that some disability service offices were overwhelmed with large amounts of work. A student described her challenges in obtaining educational supports:

[*The office of disability services*] has too much on their plate and can't provide the level of support needed. [*The*] speech pathology clinic and private doctor had to help me. [*It*] can be a problem when "outsiders" have to advocate for me.

Students also explained that educational supports should vary on an individual basis based on need, yet the office of disability services does not always take into account individual learning differences when offering educational supports. Additionally, students' perceptions of faculty attitudes toward educational supports were discussed. Students explained the problematic nature of needing to request educational supports from faculty who were teaching university-level courses. Some students experienced negative attitudes from professors when they requested educational supports. Students explained that faculty who were reluctant to offer educational supports, hindered their abilities to complete coursework. A student expressed his frustration:

Even with the law on my side, I have found much resistance from my professors because they do not believe in disabilities, but this is somewhat of a hopeless battle. Once you get the [*office of disability services*] to [*speak with*] professors to comply with the law, they hold a grudge against you and grade your work more strictly than the rest of [*my peers*]. While this is obviously illegal, it is something that is difficult to prove. For this reason, I have had to sometimes forfeit accommodations throughout my academic career in order to appease the professor because s/he is the only one who teaches the class required to graduate.

Another student offered her perception of faculty attitudes: “I feel that most professors are unwilling to put the extra effort for students with learning disabilities.” Therefore, students suggested offering faculty workshops to inform the teaching community about the characteristics of students with LD and the various types of educational supports that may be offered to benefit student learning.

Furthermore, students’ perceptions of the types of educational supports found to be most beneficial for learning were evaluated. The following procedures were used to identify various types of educational supports: (a) a list identifying educational supports was developed; (b) the list of educational supports was analyzed to create themes; (c) each theme related to educational supports was color-coded; and (d) the designated themes related to educational supports were organized by categories to include instructional, examination, and administrative supports.

The instructional supports identified by students to be beneficial for learning included the following: (a) professional note-takers, (b) lecture notes, outlines of lectures, and handouts in electronic text format, (c) specialized learning disability tutors, subject-area tutors, one-on-one tutoring, flexible tutoring sessions, and tutoring in professional degree programs (e.g., medical school), (c) captioning of DVD’s, videos, and CD’s, (d) readers, speech to text software programs and books on tape or electronic text format, (e) the need for computers with word processors at the office of disability services, (f) typing essay exams in lieu of handwriting exams (g) extra-credit/alternative assignments, (h) extended-time on all class assignments and intensive writing

assignments, (i) proofreaders, assistance with grammar writing skills and test strategies, (j) daily organizational skills, (k) in-depth explanation of assignments and tests, (l) study guides from faculty and help in studying for exams, and (m) private rooms for testing and studying that are free from distractions. The examination supports acknowledged by students to be beneficial for learning included the following: (a) review sessions and practice tests (b) extended-time on exams, (c) increase the extended-time on tests in graduate school from time and a half to double time, (d) extended-time to prepare for exams (e) make-up exams when exams overlap during the same allotted time schedule or when exams are scheduled on the same day (f) more frequent exams covering less material, (g) oral exams in lieu of essay and multiple-choice tests, (h) assistance with seeking approval of extended-time on graduate entrance exams (e.g., MCAT) and state professional exams, (i) earplugs while testing and studying, and (j) scribe and calculators for tests.

Students also documented administrative supports that were beneficial for learning as follows: (a) disability-based financial support through federal student aid programs, (b) disability-based scholarships, (c) early scheduling and registration, (d) foreign language and math requirement waivers, (e) grade replacements, (f) professional therapists to help students cope with co-existing physical and mental conditions, (g) improvement of faculty knowledge of the need for educational supports for students with LD, (h) enhanced responses from faculty via electronic mail (i) increased communication between the office of disability services and faculty members, (j) increased communication between non-disabled peers and students with disabilities and (k) warm and caring staff at disability services.

Students attest that instructional, examination, and administrative supports are necessary for successful completion of coursework and program requirements. However, students had mixed feelings about whether or not educational supports have been helpful during their programs of

study. Generally, students found educational supports beneficial for learning. Some of the student's comments reflected their positive experiences:

The accommodations [*have been*] very helpful, I would never be able to perform at the level I do now without them. I am extremely thankful and know that my grades would dramatically suffer (as would my quality of life) without their assistance.

Students believed that educational supports improved their grades and helped them pass their courses. For instance, a student commented: "Accommodations were very helpful and my grades improved. I am now a straight "A" student made possible by a few accommodations." Another student stated: "[*Accommodations*] helped me in every way; I could not [*have*] passed most of my classes without them." Students also believed that educational supports helped them compete equally alongside their non-disabled peers and improve their self-confidence. A student explained: "[*Accommodations*] are very helpful in keeping me at the same learning pace as the other students [*without disabilities*]." Another student expressed: "[*Accommodations*] have been very helpful to me because I am doing better academically; [*therefore*] my self-confidence has grown in the academic arena tenfold." Students' positive experiences regarding educational supports affirm the need for educational support services for completion of coursework and program requirements.

On the other hand, some students stated that educational supports were not helpful when services were not implemented adequately. Students expressed that educational supports were difficult to obtain in institutions that did not provide an array of educational supports for students with LD. Also, students explained that educational supports were least helpful when faculty were reluctant to provide the necessary educational supports listed on their letters of accommodation. Similarly, students found educational supports less helpful when disability services did not follow-up with complaints from students about faculty who were not providing the necessary educational supports. For example, a student described his experience:

The [*office of disability services*] outlined my needed accommodations to inform my instructors, however my instructors did not feel as if they had to accommodate me. If they did not choose to meet my needs, I did not receive backing from the office [*of disability services*] and, therefore, [*was*] not accommodated.

Another student expressed her dissatisfaction and made a suggestion:

This isn't an easy process. It can be embarrassing. Professors [*do not*] like giving accommodations and sometimes [*do not*] give them. The process and system is [*failing*]. It would work better if the disability office [*spoke with*] professors [*to implement*] these accommodations.

Therefore, students emphasized that educational supports were most helpful when faculty and disability services work collaboratively to implement best learning practices.

Students described pre-existing conditions that led to the need for educational support services as follows: (a) difficulties in completing exams and course assignments during and outside the classroom setting; (b) difficulties in completing specific types of exams to include essay exams and multiple-choice tests; (c) the need for more time to understand and learn the subject-matter; (d) inability to concentrate during class lectures and exams as well as remaining on task while performing independent assignments; (e) having developed poor study, organization, time management, listening, communication skills and test taking strategies; (f) difficulties with reading comprehension and an established slow reading rate; (g) inability to complete required reading assignments on time; (h) difficulties with note taking and copying from the board; (i) math, language, and handwriting deficits; (j) failing to understand directions and recall information; (k) difficulties memorizing facts, and (l) adjusting to the academic demands of coursework in the college setting.

Summary

The purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences with the types of educational supports needed and provided for completion of coursework and program requirements. To assess this objective, a

survey was administered to students with LD who were registered with the office of disability services at nine institutions of higher education. The survey consisted of close-ended questions addressing various types of educational supports needed and provided at institutions of higher education to include instructional, examination, and administrative supports. Also, the survey included open-ended questions to allow students to report the following: (a) personal experiences encountered with educational supports and (b) relevant information that students were willing to offer related to educational supports.

First, frequency data were gathered to represent the percentage of educational supports perceived as needed and provided for undergraduate and graduate students at institutions of higher education. Second, Pearson correlation coefficients were obtained for various types of educational supports for undergraduate and graduate students, to examine the strength and linear relationship between each measure. Several statistically significant relationships were noted. Third, a series of *t*-tests were used to assess the null hypothesis of no statistically significant differences between groups on the various types of educational supports needed and provided at institutions of higher education. Findings showed (a) statistically significant differences with the needed instructional and examination supports for undergraduate students; (b) statistically significant differences with the provided instructional supports for undergraduate students; (c) no statistically significant differences with the provided examination and administrative supports for undergraduate students; and (d) statistically and non-statistically significant differences with the needed and provided instructional, examination, and administrative supports for graduate students. Generally, graduate students perceived a greater need for various types of educational supports compared to undergraduate students. In accordance with these results, graduate students had a greater

probability of being provided with various types of educational supports compared to undergraduate students.

Fourth, a series of Chi-square tests of independence were used to assess the null hypothesis of no statistically significant differences between groups on the various types of educational supports needed and provided at institutions of higher education. Findings showed (a) statistically significant differences with the needed instructional and examination supports for undergraduate students; (b) statistically significant differences with the provided instructional supports for undergraduate students; (c) no statistically significant differences with the provided examination and administrative supports for undergraduate student; and (d) statistically and non-statistically significant differences with the needed and provided instructional, examination, and administrative supports for graduate students. Undergraduate students were provided with two of five educational supports perceived as needed. In comparison, graduate students were provided with eleven of twenty-six educational supports perceived as needed. Hence, although graduate students had a greater perceived need for educational supports, they had the same probability of being provided with such supports compared to undergraduate students.

Fifth, a series of Two-Way ANOVA were conducted to assess the main effects and interactions for each type of educational support measure needed and provided across nine institutions. Findings showed (a) statistically significant differences with the needed administrative supports for undergraduate students; (b) no statistically significant differences with the needed instructional, examination, and administrative supports for undergraduate students; (c) statistically significant differences with the needed instructional, examination, and administrative supports for graduate students; (d) statistically significant differences with the instructional and administrative supports provided to undergraduate and graduate students respectively; (e) no

statistically significant differences with the examination supports provided to undergraduate and graduate students respectively; (f) statistically significant differences with the instructional, examination, and administrative supports needed and provided across institutions; (g) statistically significant differences with the instructional, examination, and administrative supports needed for graduate students when compared across institutions; (h) no statistically significant differences with the instructional, examination and administrative supports provided for graduate students when compared across institutions; (i) no statistically significant differences with the instructional, examination, and administrative supports needed and provided for undergraduate students when compared across institutions; and (j) statistically significant differences across institutions regarding the instructional, examination, and administrative supports needed by and provided for students with LD.

Finally, open-ended questions consisting of students' written responses were themed and categorized to offer an in-depth description of students' experiences regarding their perceived needs and supports provided. Results revealed that undergraduate and graduate students perceived their needs for instructional, examination, and administrative supports as necessary to complete coursework and program requirements. However, discrepancies existed between what supports students requested and what supports institutions provided. Results also indicated that cooperation among institutions, disability services, faculty, and students were necessary for providing various types of educational supports that benefit student learning.

Chapter 4 presented the results of the data analyses in six sections. First, descriptive statistics on the sample were presented. Second, inferential statistics were used to answer the first, second, third, and fourth research questions, along with hypothesis one. To answer these questions, a series of frequency analyses, *t*-test analyses and chi-square analyses were presented.

Additionally, this chapter presented data from the Two-Way ANOVA to supplement research findings of questions one, two, three, and four along with hypothesis one. Finally, a description that addressed students' written responses to open-ended questions concerning students' perceptions of institutions, faculty attitudes, beneficial learning practices, and academic learning difficulties were presented. This section also included a description that addressed students' difficulties in obtaining educational support services and how educational supports had been helpful once received. The subsequent chapter presents a discussion of the conclusions and implications for these research findings.

CHAPTER 5 DISCUSSION

Introduction

The purpose of this study was to compare the educational supports needed and provided by institutions of higher education for undergraduate and graduate students with LD. These supports and provisions were identified as necessary for completion of coursework and program requirements for students with LD. The null hypothesis of this study was tested at a .05 level of significance:

H1: There are no statistically significant differences between undergraduate and graduate students with LD and the educational supports they perceived they needed and the supports provided for them by institutions of higher education.

Summary and Interpretation of Findings

This study addressed four research questions: (1) What types of educational supports do undergraduate and graduate students with LD perceive as needed; (2) what types of educational supports are being provided for undergraduate and graduate students with LD; (3) is there a relationship between the perceived needs and the supports provided to undergraduate or graduate students with LD; and (4) do undergraduate and graduate students with LD differ in (a) the types of educational supports needed, (b) the types of supports provided for completion of coursework and program requirements, and (c) the relationship between needs and supports provided? To address these research questions, a survey on educational supports was disseminated to undergraduate and graduate students with LD across 9 institutions of higher education.

The interpretation of these findings is presented as follows. First, the differences between educational supports needed by and provided for undergraduate and graduate students are discussed. A comparison of the educational supports needed and provided for undergraduate and graduate students is explained next. Then, a comparison of educational supports across institutions

of higher education is provided. Additionally, in this chapter is a discussion of the theoretical implications of the research findings, and recommendations for future research and practice.

It should be noted here that many discrepancies existed between what supports students requested and the supports provided by institutions. For example, when graduate students requested assistance from the writing center, disability services – not the writing center - responded by providing scribes to help them with writing assignments. These discrepancies between what supports students requested and what supports institutions provided were evident across each data analyses.

It should also be recognized that there are distinct learning characteristics between undergraduate and graduate students in the general college setting. Graduate students are a self-selected group of students who choose to attend advanced degree programs of study. For this reason, graduate students with LD share similar learning characteristics as graduate students without LD. Despite a learning disability, there are innate learning characteristics that are shared among graduate students in the general population.

Graduate students share learning characteristics that influence their desire to enter academically challenging programs of study (Cavanagh, 2009). Graduate students are characterized by having unusually high intellect and goal-oriented behaviors (Neumeister, 2004). Graduate students are known to share high motivation, hard work, and well-developed reasoning abilities (Ganschow, Coyne, Parks, & Antonoff, 1999). Graduate students are also known to have high intellectual curiosity and interest in a particular subject area in which they desire to study and advance their knowledge (Belcher & Hirvela, 2005). In general, graduate students develop above average academic skills necessary for advanced programs of study (Marra & Palmer, 2004).

Graduate students have also developed prior knowledge and experiences of the general college setting. Graduate students have acquired knowledge about specific resources that can help them improve their academic skills during their undergraduate programs. For example, graduate students are aware of certain educational supports such as the reading and writing center that are available for improving academic skill development. Graduate students have also entered advanced degree programs with prior development of metacognitive self-regulatory skills. Thus, graduate students are able to use their metacognitive skills to adjust to the academic demands and seek educational supports that benefit their learning (Ross, Samuel, Glennon, & Nona, 2006). As a result, graduate student's prior knowledge and experiences of the college setting may influence self-awareness of their own learning profiles and their need for educational supports.

Differences Between Educational Supports Needed By and Provided for Undergraduate and Graduate Students

The primary question of interest to this study was to determine whether there were differences between the educational supports needed by and provided for undergraduate and graduate students with LD. To address this question, the survey offered a list of instructional, examination, and administrative supports that may be requested by students with LD and offered by institutions of higher education. The data analyses revealed statistically significant differences between the needed and provided instructional and administrative supports for undergraduate students. Statistically significant differences were also found between the needed and provided instructional, examination, and administrative supports for graduate students. No statistically significant differences were found between the needed and provided examination supports for undergraduate students. No statistically significant differences were found between the needed and provided instructional, examination, and administrative supports for graduate students.

In evaluating differences with educational supports between groups, the data revealed statistically significant differences between the needed and provided instructional and administrative supports for undergraduate students. In comparison, statistically significant differences were found between the needed and provided instructional, examination, and administrative supports for graduate students. Overall, graduate students reported a greater need for educational supports than undergraduate students. In accordance with these results, graduate students had a greater probability of being provided with educational supports compared to undergraduate students.

These findings are a reflection of the differences between the academic demands of graduate programs and undergraduate programs. The transition from undergraduate to graduate programs for students with LD is challenging since academic demands increase as students enter graduate programs. An emphasis is placed on academic demands because students with LD need educational supports to meet coursework and program requirements at institutions of higher education (Hadley, 2007). Results from this study indicated that academic supports, such as study skills and time management, were provided by institutions of higher education to help graduate students with LD adjust to the demands of graduate programs. Although it has been shown that successful undergraduate students with LD develop compensatory strategies (Reis & McGuire, 2000), it was also known that their coping mechanisms began to break down as academic demands became more rigorous (Skinner & Lindstrom, 2003). Compensatory strategies are highly developed academic skills that match students' academic strengths and are used by students to facilitate their learning. For example, students with LD may rely on note taking skills in lieu of reading text to compensate for learning course material. Students use a preferential mode of learning to substitute for their academic weakness. However, as academic demands increase these

compensatory strategies are insufficient and, therefore, students with LD need to revisit basic academic supports to assist with learning. Also, graduate programs require students to complete a greater number of tasks as well as assignments that are larger and more complex than undergraduate programs (Skinner & Lindstrom, 2003). For this reason, findings from this study indicated that graduate students experienced a greater need for subject tutoring and one-on-one assistance than undergraduates. These findings were consistent with previous studies that found instructional supports beneficial for students with LD (Bursuck, et al., 1989; Graham-Smith & Lafayette, 2004; Houck, et al., 1992).

Learning strategies differed from compensatory strategies as follows: (a) compensatory strategies required the use of a preferential mode of learning to overcome academic weaknesses; and (b) learning strategies consisted of remediating specific academic skills to help with learning. For instance, students who struggled with reading comprehension may receive direct instruction for identifying main ideas, which would help improve learning course material. Although graduate students did not report a greater need for learning strategies with respect to academic demands, these supports were provided more often to graduate students than undergraduate students. This finding suggests that graduate students may be relying on compensatory strategies that were effective during their undergraduate program to help them continue to cope with LD in graduate studies (Reis & McGuire, 2000). This finding also suggests that graduate students with LD may have developed insight into their academic strengths and weaknesses and, therefore, prefer to find alternative options for learning rather than persist on a continuation of remediation for academic skills development. Data analyses also revealed that graduate students reported a greater need for support with class lectures, including changing the delivery of instruction and clarification of directions given in lectures. In fact, there was a positive relationship between the need to change

the delivery of instruction and the supports provided to explain or clarify directions (.533). Results also indicated that graduate students had a greater need for help with class notes such as suggesting that professors write key concepts and assignments on the board. Once again, this suggests that graduate students have developed insight about their learning styles such as whether or not they are visual or auditory learners. Students with these insights understood that they learn more in class when knowledge is delivered in multiple ways. These findings were consistent with previous research that identified the instructional supports students with LD requested (Elacqua, et al., 1996; Sharpe, et al., 2005). Also, graduate students in general may be more meta-cognitively aware of strategies that benefit their learning. Ross et al. (2006) found that college students adjust their study strategies to meet the demands of learning. In other words, undergraduate students transfer their development of metacognitive skills when they transition into graduate programs. Therefore, graduate students in general used metacognitive self-regulatory skills, which improved their academic achievement.

Another significant finding indicated that graduate students have greater needs for writing supports than undergraduate students. According to Miller and Irby (1999) larger amounts of reading and writing assignments characterize graduate programs. Graduate students are required to analyze and synthesize information to produce scholarly writing. Consequently, graduate students are expected to develop academic writing skills (Hadjiioannou, et al., 2007; Nielsen & Rocco, 2002). This may be one reason graduate students reported needing feedback on multiple drafts of papers, use of tape recorded assignments rather than written assignments, and the need for help from a writing center. This explanation can also account for the increased requests by graduate students for taped reading materials and scribes. For example, there was a positive relationship between the need for taped reading materials and scribes (.620). As a result, students with LD that

have reading difficulties may also have writing difficulties and, therefore, need writing supports equal to that of the reading supports they already receive. Nonetheless, graduate students in general who are required to write a thesis or dissertation are highly motivated in improving their academic writing skills (Ganschow, Coyne, Parks, & Antonoff, 1999). In fact, one way in which graduate students learn scholarly writing is by receiving feedback from faculty members and their advisor on papers written for class or publication. As a result, graduate students may request the need for feedback on multiple drafts of papers and help from the writing center to enhance their writing skills.

Undergraduate students had a greater need than graduate students for learning to use computer software; however, graduate students had greater needs than undergraduates for using word processors. A possible implication may be that undergraduate students are beginning to learn how to use specific computer software programs to help them adjust to the academic demands of higher education. On the other hand, graduate students in general have a greater need for word processors because graduate programs demand larger amounts of writing assignments than undergraduate programs. Undergraduate students, on the other hand, had a higher probability of being provided with access to an assistive technology lab and access to specialized software than graduate students. For instance, students with LD reported they used specially designed assistive reading and writing computer software programs such as Kurzweil and Dragon. The results of the current study were consistent with previous research studies, in which students identified using instructional supports associated with assistive technology frequently for learning (Graham-Smith & Lafayette, 2004; Sharpe, et al., 2005; Tagayuna, et al., 2005).

Additionally, results showed that graduate students had a greater need for examination supports than undergraduate students. Coursework increases in complexity as students progress

through their academic programs and larger amounts of material are expected to be covered in shorter periods of time, putting greater demands on students with LD to become independent learners (Brinckerhoff, Janiga & Constanbader, 2002; Brinckerhoff, Shaw, & McGuire, 1992; Larson, 2006; Miller & Irby, 1999; Smith, English, & Vasek, 2002). This finding also offers an explanation for why graduate students reported a greater need for frequent exams covering smaller amounts of material. Another explanation is that graduate students in general are aware of which exam format improves their academic performance based on their experiences in undergraduate studies. Therefore, graduate students are willing to request examination supports that match their performance skills. However, findings showed that graduate students with LD were provided with assistance in preparing for exams. This may be due to the tendency for faculty at institutions of higher education to offer exam review sessions for students in general. Also, graduate students with LD were in greater need of taking exams in a quiet room, with a proctor, and frequent breaks, than undergraduates with LD. A possible explanation for this finding is that graduate students with ADHD are self-aware that distractions can diminish their level of concentration. Also, graduate students in general spend twice as much time in class compared to undergraduate students. As a result, graduate students with LD who receive extended-time on exams may need frequent breaks to overcome fatigue. Examination supports have been reported as necessary by students with LD for completion of university-level courses in previous research (Elacqua, et al., 1996; Houck, et al., 1992; Sharpe, et al., 2005; Stodden, et al., 2001; Tagayuna, et al., 2005). Similarly, graduate students were more likely to request partial credit for using correct processes in math problems than undergraduates. A possible explanation for this finding is that students with LD may be able to successfully complete university-level math courses if partial credit is offered for demonstrating knowledge of procedural math rather than producing a specific outcome. Another possible

explanation for this finding is that by the time graduate students enter their degree programs they may have developed better self-advocacy skills and, therefore, were willing to request specific types of educational supports that would improve their chances of completing university-level courses.

Furthermore, findings in this study demonstrated that administrative supports are imperative in helping students with LD complete coursework and program requirements. Administrative supports have been found to be beneficial by students with LD for entering graduate programs. For example, undergraduate students had a perceived need for a graduate fellowship or assistantship that was not contingent on standardized test scores. This finding has one possible implication; undergraduate students who are planning to enroll in graduate programs are faced with the challenge of completing graduate entrance exams related to their desired program of study, such as the GRE or the GMAT. Therefore, undergraduate students perceived that their LD may impact their performance on standardized tests and perceive the need for supports to attend graduate school.

Graduate students with LD, on the other hand, perceived they had a greater need for fellowships or assistantships that were not contingent on course load requirements than undergraduates. As previously mentioned, the academic demands of graduate programs are far more rigorous than those of undergraduate programs and, therefore, graduate students had a greater need than undergraduates to seek a reduced course-load without losing financial support (Skinner & Lindstrom, 2003). Graduate students with LD who receive a reduced course-load are also able to dedicate more time to their academic studies such as preparing for course assignments and exams while attending to independent research projects and writing for publication. Additionally, graduate students who are enrolled in a reduced course-load are better able to manage their daily

stress and anxiety that can be exacerbated by their LD. As a result, graduate students with LD are able to improve their ability to learn in academic settings at the same rate as their non-disabled peers.

Moreover, graduate students had a greater need for supports with respect to course registration and scheduling than undergraduate students. For instance, graduate students reported the need for priority registration, early registration, priority course scheduling, modified schedules, and withdrawing from courses after the official cut-off-date, and they had a higher probability of being provided with these supports than undergraduates. It is uncertain whether graduate students were offered priority registration based on their status of enrollment as graduate students or as a result of being registered with the office of disability services. Regardless, this finding indicates that graduate students with LD were given priority enrollment. Graduate students also had the convenience of modifying their schedules to benefit their learning needs. These findings are consistent with previous research studies, in which institutions provided administrative supports for students with LD (Graham-Smith and Lafayette, 2004; Sharpe, et al., 2005).

Graduate students reported having a greater need for priority course scheduling than undergraduates. This finding suggests that students with LD want the option of enrolling in courses with faculty members whose teaching styles meet the student's mode of learning (Honigsfeld & Dunn, 2006). Also, students with LD who have ADHD need to schedule their courses during specific times of the day when they are able to concentrate and attend to class lectures without distractions. Additionally, students with LD who receive extended time on exams and in class assignments need to schedule courses apart from each other to allow for frequent breaks and prevent from having courses overlap with each other on the days when there is a need for extended time to be implemented. For this same reason, graduate students had a greater need for early

registration. Also, graduate students had a greater need to withdraw from courses after the usual cut-off-date than undergraduates. Since greater amounts of material are covered in graduate-level courses, graduate students who have LD may need more time to determine whether or not they will be able to remain enrolled in courses without receiving failing grades (Brinckerhoff, Janiga & Constanbader, 2002; Miller & Irby, 1999).

A Comparison of the Educational Supports Needed and Provided for Undergraduate and Graduate Students

Another question of interest in this study was whether the supports that students perceived as needed were actually provided by institutions of higher education. To address this question, each educational support needed by students and provided by institutions was examined to determine whether or not there was a match. The data analyses revealed statistically significant differences between the needed instructional and examination supports for undergraduate students. Statistically significant differences were also found between the provided instructional supports for undergraduate students. No statistically significant differences were found between the needed and provided examination and administrative supports for undergraduate students. Mixed results were found between the needed and provided instructional, examination, and administrative supports for graduate students.

A comparison of the educational supports between groups revealed statistically significant differences in instructional and examination supports needed by graduate and undergraduate students with LD. Statistically significant differences were also found in the supports provided for graduate and undergraduate students with LD related to instructional supports. Undergraduate students were provided with two of five educational supports perceived as needed. Hence, institutions of higher education provided the educational supports needed by undergraduate students 40% of the time. Statistically significant differences were found between the supports

needed and provided with respect to instructional, examination, and administrative supports for graduate students. Graduate students were provided with 11 of 26 educational supports perceived as needed. Therefore, institutions of higher education provided educational supports perceived as needed by graduate students 42% of the time. As a result, because graduate students had a higher perceived need for educational supports, they also had a slightly higher probability of being provided with such supports compared to undergraduate students.

Results of this study demonstrated that there were significant differences between the supports perceived as needed by graduate students and the supports provided by institutions of higher education. Instructional supports were found to be the most commonly provided while examination and administrative supports were found to be the least commonly provided for graduate students. For example, if graduate students needed instructional supports such as the help with study skills, subject tutoring, and one-on-one assistance, each of these supports were commonly provided by institutions of higher education. These findings were consistent with previous research that indicated instructional supports to be the most commonly offered supports for students with LD at institutions of higher education (Elacqua, et al., 1996; Sharpe, et al. 2005; Stodden, et al., 2001).

As mentioned previously, the most common educational support services being offered by institutions of higher education reflect instructional supports that are indicative of a minimalist approach. The most common educational supports offered to students with disabilities are the least expensive, most available, and easily accessible (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999).

Graduate students had a greater need for examination supports but they also had a higher probability of not being provided with examination supports. Consequently, graduate students with

LD were being denied examination supports they perceived necessary to complete university level-courses. Findings in this study related to examination supports contradict the findings in previous research that reported testing accommodations as one of the most common educational supports offered to students with LD (Stodden, et al., 2001; Tagayuna, et al., 2005). One possible reason for this contradiction is that some examination supports may be more commonly offered than others. For instance, extended-time on exams might be more commonly offered than modifying exams with objective questions rather than essay questions (Norton, et al., 1997; Vogel, et al., 1999). Another reason for this contradiction is that institutions are unable to provide a specific examination support requested by students during mid-term and final exam weeks when a greater number of students are requesting similar supports. For example, a student might request taking exams in a room free of distractions, but disability services may lack the office space necessary to provide this support to each student. Therefore, staff members coordinate for students to take exams in a room with other students who have similar needs for such supports. In this case, disability services failure to provide students with such specific request for educational support may stem from a lack of financial funding (Pacifci & McKinney, 1997). Nonetheless, Vogel et al. (1999) found that most faculty members were willing to provide partial credit for using correct math processes. This finding was surprising because faculty members concern was with maintaining academic integrity and fairness for students without disabilities (Nelson, Dodd & Smith, 1990; Murray, Wren, & Keys, 2008). However, faculty may also provide partial credit for using correct math processes for all students in general because they may believe that having an understanding of mathematical concepts are more important than producing a specific outcome. Additionally, if assistance in exam preparation was offered it may have been a result of professors

offering review sessions for students in general and not necessarily related to the needs of students with LD.

Graduate students had a greater need for administrative supports in the areas of guidance services, course registration and scheduling, and transition from university to employment. Findings showed, however, that graduate students did not have a higher probability of being provided with guidance services or transition to employment. There is a possibility that graduate students in general have a greater need for transition from university to employment because of their prior work experiences. Graduate students who enter graduate programs enter with a history of work related experiences and, thus, value the importance of developing employment skills while enrolled at institutions of higher education (Middleton, 2001). Another possible implication for graduate students need for guidance services is wanting to learn about numerous career options that are available through their program of study. Similarly, graduate students in general have work responsibilities related to their graduate fellowship or assistantship as well as their personal careers that may require them to seek flexible course registration and scheduling options (Austin, 2002; Hadjioannou, Shelton, Fu, & Dhanarattigannon, 2007; Miller & Irby, 1999; Ramsay, et al., 1999). Although graduate students had a greater need than undergraduates for supports with course registration and scheduling, priority registration and modified schedule were the only supports provided as also evidenced in previous studies (Stodden, et al. 2001, Tagayuna, et al., 2005). As a result, institutions of higher education provided 40% of the educational supports perceived needed by graduate students in the area of course registration and scheduling. Results of this study supported previous findings that administrative supports were the least commonly offered supports to students with LD (Sweener, et al., 2002).

Another finding of this study indicated that less time-consuming supports were provided more frequently than more time-consuming supports. In fact, instructional supports for academic development such as time management and subject tutoring, embedded in postsecondary learning, were provided to undergraduate and graduate students. Also, support for class notes (e.g., writing key concepts on the board and taped lectures) and class lectures (e.g., changing the delivery of instruction) were provided to undergraduate and graduate students respectively. Similarly, examination supports such as taking exams in a quiet room with a proctor and frequent breaks were provided on-site at the office of disability services to undergraduate students. These findings are consistent with previous findings in which faculty were willing to offer supports that demanded less of their time (Vogel, 1999). Conversely, findings from this study reported that graduate students had a greater probability of being provided with frequent exams, covering less material, which could create more work for faculty to implement. These findings suggest that when faculty members perceived they had the assistance of disability services and their departments, they were more willing to provide time-consuming supports for students with disabilities. These findings support previous studies related to faculty supports (Bourke, Strehorn, & Silver, 2000; Murray, Wren, & Keys, 2008). Another explanation is that faculty may have had help from graduate students who were assigned as teaching assistants to help them with the development and planning of course material. In this way, teaching assistants role may have been to modify exams to meet the request of examination supports for students with LD and, thus, alleviate time-consuming practices from faculty members (Austin, 2002; Hadjioannou, et al., 2007).

Additional data revealed that some institutions were unwilling to provide administrative supports (early registration, priority course scheduling, and late withdrawal from courses) despite graduate students' needs. Similarly, other institutions were unwilling to provide supports for

transition to employment (e.g., learning to use assistive technology devices specific to employment opportunities) and assistive technology (e.g., learning to use computer software and access to staff trained in assistive technology) even though they were reported as being needed by graduate students. These findings are consistent with previous studies in which supports for transition to employment and assistive technology are the least commonly offered administrative supports even though such supports are the most commonly requested by students with LD (Sharpe, et al., 2005; Stodden, et al., 2001; Tagayuna, 2005; Dowrick, et al., 2005). This could be indicative of lack of funding and staff at offices of disability services at institutions of higher learning. In fact, Dowrick, et al. (2005) explained that students with disabilities perceived that the denial of educational supports was exacerbated by the lack of personnel available in disability services offices. Another explanation is that the office of disability services may view that it is the responsibility of graduate programs to help students in general with registration for courses and their transition to employment by exposing them to work related experiences through internship placements.

Furthermore, an interesting finding showed that graduate students had a greater need for self-advocacy skills and counseling services than undergraduate students. These findings indicated that when students with LD transition from high school to postsecondary education, they are unprepared to learn self-advocacy skills. Furthermore, once enrolled in undergraduate programs, students remain unaware of the possibilities they have with respect to learning self-advocacy skills. Therefore, students with LD fail to acquire knowledge about disability laws, the educational supports available, and strengths and weaknesses associated with their disabilities. However, exposure to the office of disability services during undergraduate studies may help graduate students with LD develop self-awareness toward the need for developing self-advocacy skills in their graduate programs to compete alongside their non-disabled peers in academic settings.

According to Stodden et al. (2001), the educational supports provided by institutions leaned toward advocacy on behalf of students rather than training on self-advocacy skills for independent living. Students with disabilities mentioned feeling empowered when disability services provided instruction on self-advocacy skills along with letters of educational support for requesting services (Graham-Smith & Lafayette, 2004). Similarly, the transition from high school to postsecondary education and from undergraduate to graduate programs requires adjusting to social and emotional demands. However, graduate students with LD have greater social responsibilities and experience greater emotional demands compared to undergraduate students with LD (Austin, 2002; Hadjioannou, et al., 2007; Middleton, 2001; Miller & Irby, 1999; Nyquist, et al., 1999; Ramsay, et al., 1999; Wang, 2003). For example, because graduate students enter university later in life they experience a greater amount of responsibility for family, work, and financial obligations (Middleton, 2001). Similarly, graduate students may need to overcome feelings of loneliness, isolation and emotional stress that are experienced during independent learning (Austin, 2002; Lovitts, 2001; Hadjioannou, et al.2007; Middleton 2001; Nyquist, et al.1999; Wang, 2003). As a result, graduate students with LD may have a greater need for counseling services. Fortunately, previous studies have found that advocacy assistance and personal counseling are commonly offered at institutions of higher education for students with LD (Stodden, et al. 2001; Tagayuna, et al., 2005).

Supplemental Analyses Comparing the Educational Supports Needed and Provided for Undergraduate and Graduate Students Across Institutions of Higher Education

Supplemental inquiry to this study was to compare the types of educational supports needed by and provided for students across institutions of higher education. This question was addressed by evaluating students' perceived needs and provisions of educational supports across institutional settings. Statistically significant differences were found between the needed and

provided administrative supports for undergraduate students. Statistically significant differences were found between the needed and provided instructional, examination, and administrative supports for graduate students. Statistically significant differences were found between the instructional and administrative supports provided to undergraduate and graduate students. Statistically significant differences were found between the instructional, examination, and administrative supports needed and provided across institutions. Statistically significant differences were found between the instructional, examination, and administrative supports needed and provided for graduate students across institutions. Statistically significant differences were found across institutions between the instructional, examination, and administrative supports needed and provided for students with LD. No statistically significant differences were found between the instructional, examination and administrative supports needed and provided for graduate students when compared across institutions. No statistically significant differences were found between the needed and provided instructional, examination, and administrative supports for undergraduate students. No statistically significant differences were found between the examination supports provided to undergraduate and graduate students. No statistically significant differences were found between the instructional, examination, and administrative supports needed and provided for undergraduate students when compared across institutions.

Supplemental data analyses for this study produced six statistically significant findings when comparing graduate and undergraduate students with LD at institutions of higher education. These six findings confirmed (a) that graduate students had a greater need for instructional, examination, and administrative supports; (b) that undergraduate students had a greater need in only one area of administrative supports; (c) that undergraduate students had a greater probability of receiving instructional and administrative supports; (d) that graduate students had a greater

probability of receiving instructional supports; (e) that graduate students had an increasingly higher variation across institutions for needed instructional, examination, and administrative supports; and (f) that there were differences across institutions with respect to the instructional, examination, and administrative supports needed by and provided for students with LD.

In accordance with previous data analyses, a third series of data analyses showed that graduate students had a greater need for instructional, examination, and administrative supports compared to undergraduate students. Graduate students had a greater need than undergraduates for instructional supports as follows: (a) changing the delivery of instruction, (b) review of assignments, (c) comments on drafts of papers, (d) tape recording of assignments rather than written assignments; (e) taped reading materials, (f) use of writing center, (g) subject tutoring, (h) one-on-one assistance, (i) use of word processor, (j) communicating with instructor via e-mail, and (k) access to staff trained in assistive technology. Graduate students also had a greater need than undergraduates for two types of examination supports as follows: (a) taking exams in a quiet room with a proctor, and (b) more frequent exams covering less material. Graduate students had a greater need than undergraduates for six types of administrative supports as follows: (a) graduate fellowship or assistantship not contingent on standardized test scores (b) priority registration, (c) early registration, (d) priority course scheduling, (e) modified schedule, and (f) late withdrawal from courses. These educational supports range from the most commonly provided supports to the least commonly provided supports as evidenced in previous studies (Sharpe & Johnson, 2001; Stodden, et al., 2001; Tagayuna, et al., 2005). Also, these educational supports have been found to be among the most requested and beneficial for learning by students with LD at institutions of higher education as noted in previous studies (Beilke & Yssel, 1999; Dowrick, et al., 2005; Elacqua, et al., 1996; Graham-Smith & Lafayette, 2004; Houck, et al., 1992; Sharpe, et al., 2005).

These findings illustrate the differences in academic demands between graduate and undergraduate programs. The transition from undergraduate to graduate programs for students with LD is challenging because academic demands increase (Hadley, 2007; Sinner & Lindstrom 2003). It is important to note, however, that the transition from undergraduate to graduate studies are challenging to all students, except that it might take students with LD a longer time to adjust to the academic demands compared to their non-LD peers. Also, the academic demands may appear greater for graduate students with LD whose academic difficulties are being exacerbated by their LD. Therefore, graduate students had a greater need than undergraduates for educational supports to help them compete alongside their peers without disabilities. They also have the added challenge of coping with the rigors of graduate and professional programs while managing their LD (Brinckerhoff, 1996; Hadley, 2007; Heiman & Kariv, 2004; Smith, English, & Vasek, 2002).

Given the results of this study, it is not surprising that undergraduate students only had one greater need than graduate students: a fellowship or assistantship not contingent on standardized test score. Undergraduate students planning to attend graduate programs recognize the need for accommodations with standardized tests that determine their admittance into graduate programs. Unfortunately, these findings suggest that undergraduate students failed to recognize their need for varying types of educational supports that may help them complete coursework and program requirements. These results also indicate that undergraduate students with LD fail to self-advocate as well as overlook opportunities that may benefit their learning. Supplemental data analysis also confirms previous data analyses, in which undergraduate students had a greater probability of being provided with instructional and administrative supports than graduates. Instructional supports included (a) use of a writing center, (b) access to assistive technology, and (c) access to specialized software. Administrative supports included graduate fellowships or assistantships not

contingent on course load requirement. Conversely, graduate students had a greater probability than undergraduates of being provided with the following instructional supports: (a) writing key concepts and assignments on the board, (b) taped reading materials, (c) time management, (d) learning strategies, (e) subject tutoring, (f) one-on-one assistance, (g) learning to use computer software, and (h) modified schedules. These findings are consistent with previous research that reported institutions of higher education are most likely to take the minimalist approach when providing supports for students with LD (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999). It should be taken into consideration that government funding might be one reason why institutions may offer the least expensive and easily accessible educational supports available (Pacifci & McKinney, 1997).

Another significant finding revealed that graduate students had an increasingly higher variation across institutions than undergraduates for needed instructional, examination, and administrative supports. Instructional supports included (a) review of lectures, (b) additional explanation and clarification of directions, (c) outlines of lectures, (d) tape recorded lectures, (e) comments on drafts of papers, (f) tape recording of assignments rather than written assignments, (g) scribe, and (h) access to specialized software. Examination supports included (a) taking exams in a quiet room with a proctor, and (b) replacing the lowest exam score with an alternative assignment. The administrative supports included (a) early registration, (b) course scheduling, and (c) modified schedule.

This finding indicates that students with LD have different learning profiles and different needs depending on their strengths and weaknesses. Thus, students with LD encounter a number of academic challenges as a result of their disabilities. For example, students with LD may have “significant difficulties in acquisition and use of listening, speaking, reading, writing, reasoning, or

mathematical abilities” (NJCLD, 1994, p. 65). In other words, students with LD can have different needs even though they may share similar characteristics. As a result, the needs for educational supports for students with LD should be tailored to the individual needs of each student. This finding is consistent with that of Dowrick et al. (2005), which recommends that disability services employ personnel that can offer differentiated instruction for students with disabilities.

Furthermore, these findings indicate that program requirements across institutions may vary and, therefore, students with LD may need to request educational supports to match the specific demands of the academic program. Although academic programs of study share similar course requirements, program requirements may differ depending on the degree sought. For example, some graduate and professional programs may require a written thesis or dissertation while other advanced degree programs may limit their requirements to comprehensive examinations (Lovitts, 2001; Middleton, 2001). Also, some graduate and professional programs require students to demonstrate knowledge learned through completion of coursework. These differences among program requirements may influence the types of educational supports requested by students with LD across institutions of higher education. For this reason, researchers have noted that students with LD should become familiar with coursework and program requirements as well as the types of educational supports offered across institutions of higher education prior to attending a program of study (Babbitt & White, 2002; Brinckerhoff, 2001; Hadley, 2007).

Furthermore, findings of this study indicated that instructional, examination, and administrative supports needed by and provided for students with LD varied across institutions. Instructional supports included (a) review of lectures, (b) outlines of lectures, (c) tape recorded lectures, and (d) one-on-one assistance. Examination supports included (a) frequent breaks during

exams, and (b) more frequent exams covering less material. Administrative supports included (a) course waivers, (b) early registration, (c) priority course scheduling and, (d) modified schedules. Educational supports varied across institutions due to the fact that students with LD are a heterogeneous group.

Instructional supports provided across institutions with some degree of variation included the following: (a) explaining or clarifying directions, (b) comments on draft of papers, (c) tape recordings of assignments rather than written assignments, (d) scribe, (e) use of a writing center, and (f) access to specialized software. Examination supports included (a) extended-time on exams, (b) test questions worded in a simplified manner, and (c) assistance in preparing for exams. Administrative supports included priority course scheduling.

The finding that educational supports provided for students with LD varied across institutions was significant because the institutions in this study were four-year, high-population, public institutions. Hicks-Coolick and Kurtz (1996) and Sharpe and Johnson (2001) found that educational supports varied across institutions of higher education based on size (large versus small), and type (public versus private). Also, Bursuck, et al. (1989) and Nelson and Lignugaris-Kraft (1989) indicated that educational supports varied across institutions based on the mission statements of the institutions and whether or not they provided remedial services. However, the findings of the current study contradict those noted in previous studies.

A possible reason for the variation across institutions for the educational supports provided may be a result of the emphases institutions place on their service goals. For instance, provisionary services may depend on whether or not institutions emphasized Section 504; compensatory learning strategies or basic skill remediation as evidenced in the study by Bursuck et al. (1989). Another reason for the variation across institutions with educational supports is the extent to which

disability services informs faculty about laws, availability of services and resources, and characteristics of students with LD (Vogel, et al., 1999). Variation across institutions may also be influenced by faculty members' prior experience of working with students with LD (Norton, 1997; Vogel, et al.1999). Furthermore, the variation across institutions for the educational supports provided are a result of law suits or court proceedings that have been settled at the local district and state level between the student with disabilities and their attending institution (Gitlow, 1999).

Theoretical Implications of the Research Findings

Bronfenbrenner's ecological systems theory, which focuses on the development of the adult learner within the context of the environment, was applied in this study. A series of open-ended questions included in the survey allowed students to share their experiences associated with their perceptions of institutions, faculty members' attitudes, beneficial learning practices, and academic learning difficulties. Additionally, the open-ended questions offered students the opportunity to express whether or not they experienced difficulties in obtaining services and how educational supports were helpful once received.

In developing themes and categories to analyze students' written responses, research findings revealed all components of Bronfenbrenner's ecological systems theory. The concentric circles of Bronfenbrenner's model specify the four systems as follows: (a) microsystem, (b) mesosystem, (d) exosystem, and (d) macrosystem. In Bronfenbrenner's theory the four systems interact to help support students with disabilities benefit from learning. A description of the concentric circles and how they relate to the current study is provided in chapter one.

Bronfenbrenner's theory can be applied to the findings of this study by describing students perceptions as follows: (a) institutions offer limited educational supports required by law; (b) negative faculty attitudes toward educational supports hinder students ability to complete university-level courses; (c) students' lack of knowledge of disability laws and educational

supports offered at institutions of higher education limit their abilities for self-advocacy; and (d) disability services is most helpful when adequately staffed to assist students request, faculty support as well as creating a caring environment. Therefore, the use of Bronfenbrenner's ecological systems theory demonstrates how interaction among the different environments affects accessibility to educational supports for students with LD. As a result, findings in this study serve to confirm that collaboration among institutions, faculty, students, and disability services are necessary to offer students with LD the necessary educational supports for completing coursework and program requirements.

Recommendations for Future Research

Since the passage of the ADA in 1990, institutions of higher education are mandated to provide students with LD educational supports. This has resulted in an increased number of students with LD who have been able to complete undergraduate and graduate program requirements (Henderson, 1999; Henderson, 2001). Although the educational supports offered include instructional, examination, and administrative supports, institutions of higher education still apply the minimalist approach to support by offering the least expensive, least time consuming, and most easily accessible supports for students with LD (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999). Even when institutions provide educational supports, faculty members may be reluctant to offer such supports to students with LD (Nelson, et al., 1990; Norton, 1997; Sweener, et al., 2002; Vogel, et al., 1999). Findings of the current study revealed that students with LD at institutions of higher education reported having to ignore their need for educational supports based on financial hardship as well as lack of knowledge of disability laws. Additionally students with LD reported being less than successful at self-advocacy. As a result, recommendations for future research on institutions, faculty, students with LD, and disability services are presented.

Recommendations for Future Research on Institutions

The most common educational supports that institutions of higher education offer to students with disabilities are instructional supports to assist in completing coursework (Sharpe & Johnson, 2001; Stodden, et al., 2001; Tagayuna, et al., 2005). Yet, students with LD also need administrative supports to help them complete program requirements. Based on previous court hearings, administrative supports are necessary for students with LD. For example, in *Guckenberger v. Boston University* (1997/1998) and *Pangburn v. Northern Kentucky University* (2000), students with LD requested course waivers and course substitutions; however, their efforts failed. The courts' decisions to decline administrative supports for students with LD may cause institutions of higher education conflict when deciding whether or not to grant supports. Currently, there is a lack of scientific evidence to demonstrate the types of administrative supports that institutions of higher education provide and what students with LD deem necessary to complete program requirements. Therefore, research is needed to identify the administrative supports offered at institutions of higher education. Also, since academic standards vary according to institutional size, type, and mission statement, differences in the administrative supports offered are unknown. In fact, researchers have not identified the differences in administrative supports between large public and small private schools, or two-year and four-year institutions (Bursuck, et al., 1989; Hicks-Coolick & Kurtz, 1996; Nelson & Lignugaris-Kraft, 1989; Sharpe & Johnson, 2001; Stodden, et al.2001; Tagayuna, et al., 2005). Consequently, further research is necessary to evaluate the level of administrative supports being offered and related variables.

Another area that has not been studied is how educational supports are implemented on a daily basis with students with disabilities. Institutions of higher education may offer educational supports to students with LD but this does not guarantee daily practical use of technological equipment and effective learning practices. Institutions of higher education may fail to help

students with LD if the educational support services they provide are not efficient. For instance, a reading scanner may be offered by disability services to assist students with reading disorders. However, the amount of time a student spends scanning a text may be longer than it takes to actually read the text. Likewise, institutions may request that faculty seek in-class student volunteers to act as note takers for students with LD. However, note takers may write illegibly or be absent from lectures, resulting in inadequate services for students with LD. Thus, it is important to assess whether or not the educational supports offered to students with LD are practical for daily use and effective in meeting individual learning goals (Nelson & Lignugaris-Kraft, 1989; Stodden, et al., 2001; Tagayuna, et al., 2005).

Recommendations for Future Research on Faculty

Since faculty members are responsible for teaching students with LD and providing educational supports, the need to assess faculty members' attitudes towards services for students with disabilities is essential. Research has shown that faculty attitudes toward educational supports are influenced by the support received from disability services, academic departments, and prior experiences teaching students with LD (Bourke, Strehorn, & Silver, 2000; Norton, 1997; Vogel, et al., 1999). Therefore, more research is needed on faculty's perceptions of the support provided from disability services, chairpersons, and office staff in their departments, as well as prior experience with students with LD. Furthermore, research is needed to determine if faculty attitudes toward educational supports are influenced by their knowledge of federal laws (ADA and Section 504) and the characteristics of students with LD. Additional research is also needed to examine if there are differences among faculty members' attitudes towards educational supports with respect to their academic disciplines (Nelson, et al., 1990). Findings from future research can inform institutions of higher education about the need to offer professional development seminars to help faculty improve educational support practices.

On a related note, institutions of higher education employ graduate teaching assistants (GAs) to provide course instruction (Austin, 2002; Hadjioannou, et al., 2007). Therefore, GAs are as likely to encounter students with LD as faculty members. Although institutions of higher education are obligated to provide educational supports, federal law protects students' confidentiality (ADA, 1990) making it difficult for faculty to share student information with GAs. Nonetheless, GAs who teach courses independent of faculty are also required to provide educational supports to students with LD. Consequently, additional research could evaluate the attitudes of GAs with respect to working with students with LD and if GAs are informed about federal laws regarding students with disabilities.

Another area of concern is the notable difference between services offered in undergraduate programs compared to services offered in graduate programs for students with disabilities. The primary concern in this area is academic standards (Hadjioannou, et al., 2007). Academic standards vary by coursework and program requirements. Program requirements in undergraduate school primarily focus on completing coursework. Undergraduate coursework requires minimal exams, research papers, and projects to demonstrate content knowledge (Brinckerhoff, 1996). On the other hand, program requirements for graduate school require comprehensive examinations and a thesis or dissertation depending on the degree being pursued (Middleton, 2001). Given the differences in academic rigor in the respective programs of study, faculty expectations change depending on the student's degree seeking status (Nyquist, et al., 1999; Wang, 2003). As a common rule, faculty expectations increase as students proceed in academic programs of study (Nyquist, et al. 1999). As a result, research is needed to assess whether or not faculty attitudes toward providing educational supports are also influenced by a student's degree program.

Recommendations for Future Research on Students

Improving access to institutions of higher education for students with LD involves offering educational supports. AHEAD explains that access to educational supports is based on psycho-educational testing and diagnoses of disability. Unfortunately, students who enter institutions of higher education without prior knowledge of having LD may fail repeatedly and eventually drop out of college because they are undiagnosed. Without a diagnosis, they are unable to receive educational supports. Likewise, students entering university with prior diagnosis of their LD may be required to seek current documentation before being eligible to receive educational supports (AHEAD, 2008). For some students, financial obligations may impede them from obtaining documentation of their disabilities as private testing and assessment can be quite costly. Therefore, students find themselves attempting to perform academic tasks without the necessary educational supports. As a result, examining the extent to which institutions provide psycho-educational testing and diagnosis for students is important.

In addition, students with LD are typically required to participate in an individual interview to discuss their need for educational supports during the eligibility process. At this time, students with LD must address reasons for requesting specific educational supports; this requires students to explain their strengths and weaknesses in academic settings. Consequently, students with LD need to develop self-advocacy skills to help communicate their needs to disability services and faculty (Hadley, 2007; Johnson, 2007). As a result, research is needed to understand the extent to which students with LD are being provided self-advocacy training prior to entering institutions of higher education. Likewise, further research is needed to determine if disability services provides training in self-advocacy skills for students with LD to help them communicate their need for educational supports to faculty. Students with LD that develop self-advocacy skills are able to make informed

decisions about the educational supports they need to complete coursework and program requirements (Hadley 2007; Johnson, 2007).

Students with LD entering institutions of higher education are expected to perform academically at the same level as their non-disabled peers (Brinckerhoff, 1996; Dalke & Schmitt, 1987). Students with LD are expected to take notes during lectures, read large amounts of text, demonstrate proficient writing skills, and implement study strategies in preparing for exams. As students with LD proceed to a more rigorous academic environment, coursework becomes increasingly challenging (Larson, 2006; Smith, English, & Vasek, 2002). Therefore, students with LD may struggle to maintain good academic standing. As a result, students with LD need educational supports to help them overcome academic difficulties (Hadley, 2007; Heiman & Kariv, 2004; Smith, et al.2002). However, some students with LD are unaware of their rights to receive educational supports and may lack information about the educational supports they are entitled to request. Consequently, students with LD need orientations on the procedures for receiving educational support services (Stodden, et al., 2001; Tagayuna, et al., 2005). Students with LD can also benefit from being informed about the types of instructional, examination, and administrative supports available when entering institutions of higher education. For this reason, more research is needed to evaluate if students with LD are receiving orientations that inform them about disability laws and the resources available from disability services.

Recommendations for Practice

Results of this study showed that improving access to educational supports for students with LD at institutions of higher education is necessary to help students complete coursework and program requirements. Accessibility of educational supports for students with LD can be improved by collaborative participation among institutions, faculty, students with LD, and disability services

(Elacqua, et al. 1996; Houck, et al., 1992). Therefore, recommendations to improve educational support practices at institutions of higher education are presented based on the results of this study.

ADA (1990) requires formal documentation of a learning disability by a licensed psychologist and for a student to be registered with the office of disability services at institutions of higher education prior to being provided educational support services (AHEAD, 2007). Findings in this study showed that students with LD have found psycho-educational testing to be difficult because it is expensive and a lengthy process that could take several months. For example, a student responded with the following to an open-ended survey question: “To get tested [*for a learning disability*] you have to wait [*six*] months, so I had to get tested outside the university and pay a lot [*of money*] out of pocket.” Another student describes her experience: “Sufficient testing and reports [*for a learning disability*] were expensive and my school does not provide any kind of subsidized testing for students.” Unfortunately, students who do not receive financial support for psycho-educational testing and documentation in a short period of time fail to receive educational supports through the office of disability services. Thus, institutions of higher education should provide psycho-educational testing for students with LD at an affordable cost with testing results available within a couple of weeks.

Although disability laws require institutions of higher education to offer educational supports to students with LD, the results of this study indicated that institutions continue to provide educational supports that are the least expensive, most easily accessible, and most widely used, as noted in previous studies (Sharpe, et al., 2005; Tagayuna, et al., 2005; Vogel, et al., 1999). Consequently, students with LD may be requesting certain educational supports, yet such supports are not being provided to them for coursework and program completion (Elacqua, 1996; Sharpe, et al., 2005). For instance, a student commented: “Extra credit [*assignments*] have never been offered

to me as an accommodation.” Similarly, another student explained: “I am among many [*students with disabilities*] who have been arbitrarily denied a foreign language waiver and this may affect [with] what degree we graduate.” This indicates that institutions need to provide educational supports that include an equal distribution of instructional, examination, and administrative practices, tailored to the needs of the students.

Another important factor for improving accessibility of educational supports for students with LD at institutions of higher education includes faculty attitudes toward educational supports. Results of this study indicated that students’ perceptions included negative faculty attitudes toward educational supports as evidenced in previous studies (Nelson, et al., 1990; Norton, 1997; Sweeney, et al.2002; Vogel, et al., 1999). Students experienced faculty members’ reluctance to provide educational supports adequately, thus affecting their learning performance. For example, a student commented:

Some [*professors*] are [*willing*] to accommodate the needs of [*students with disabilities*] more than others. Most [*professors*] did not want to deal with the testing center. They would [*have*] me [*begin*] testing with the class and then move [*me*] to another room afterwards, [*thus*] if I had questions I could not ask them. [*Also*], some professors do not like being [*tape*] recorded [*during lectures*].

Another student stated his experience: “Some graduate instructors did not understand my needs [*for accommodation*]. [*Therefore*], my first semester was very difficult [*because*] I did not understand some of my courses. I felt intimidated in the classroom.” This indicates the need for disability services to develop workshops to inform faculty members about disability laws, student rights to receive educational supports, and provided information on the characteristics associated with LD (Dowrick, et al., 2005; Elacqua, et al.; Houck, et al. 1992).

Additionally, the responsibility of accessing educational supports at institutions of higher education depends on the student’s ability to self-advocate (Babbitt & White, 2002). Students with LD who do not receive the educational supports necessary to compete alongside their non-disabled

peers may fail to maintain the fast pace of academic scholarship. These findings were consistent with previous studies (Hadley, 2007; Heiman & Kariv, 2004; Smith, English, & Vasek, 2002). As illustrated by the following statement, a student explained: “I never was able to complete a test in the given amount of time. Also, I had difficulty with finishing work in class or keeping up with [lecture] notes.” Therefore, students with LD need to be well informed about disability laws, their strengths and weaknesses, and needed accommodations (Babbitt & White, 2002). Therefore it is advised that disability services provide orientation programs to offer students with LD information regarding disability laws, educational supports that may be requested, and workshops to help students develop self-advocacy skills to complete university-level courses.

Furthermore, accessing educational supports for students with LD can be improved with the involvement of disability services. Disability services may help students feel less anxious about requesting educational supports by allowing students to request supports once per academic year rather than each semester. For example, a student indicated: “I just do [not] have the time [and] energy to [request] accommodations each semester.” Similarly, a student explained the difficulty of obtaining academic accommodations:

I have to go [to] the office of disability services at [the] begin of each semester to receive accommodations and letters for professors rather than being able to email request for letters. [This takes too much of my time because] I live an hour away.

Another student expressed her feelings:

I barely have enough energy to go to work, care for [my] child, and go to school. Having to [take other] steps by [requesting] accommodations [and] explaining to [my] instructors [my disability takes away too much time]. I stopped getting accommodations. I feel embarrassed.

Disability services may also need to hire more staff to assist in communicating the educational supports needed from students with LD directly to faculty or act as mediator in communicating such supports between student and faculty (Dowrick, et al., 2005). For instance, a student explained:

I was told by the [*office of disability services*] that they were not allowed to communicate with professors on behalf of students and so it was hit or miss whether or not a professor would accept [*my*] disability and provide me with [*the*] needed [*accommodations*]. It would be extremely helpful [*for*] the disabilities center [*to define the term*] learning disabilities [*to faculty*] and explain why a student might need certain accommodations in order to educate professors on a disability that is still largely stigmatized.

Another student stated: “A lot of responsibility is placed on the student to seek out assistance from [*professors*] which at times felt like a lot of pressure.” Ultimately, the best educational support practices would be implemented with the collaboration of administrators, faculty members, students with LD, and disability services (Elacqua, et al. 1996; Houck, et al., 1992).

Summary of Findings

The purpose of this study was to compare undergraduate and graduate students with LD to identify their similarities and differences with respect to the educational supports needed and provided for completion of coursework and program requirements. Several important findings were revealed in this study that affect the educational supports needed by and provided for undergraduate and graduate students with LD. First, the academic, social, and emotional demands of graduate programs are far more rigorous and challenging than undergraduate programs (Larson, 2006; Smith, English, & Vasek, 2002). Therefore, findings indicated that graduate students had a greater need for educational supports compared to undergraduate students. In accordance with these findings, graduate students had a higher probability of being provided with educational supports.

Second, instructional supports perceived as needed by undergraduate and graduate students with LD were more frequently provided than examination and administrative supports. This finding was consistent with previous studies in which the educational supports provided included the least expensive, most available, and easily accessible. Therefore, the educational supports that

students with disabilities are provided are indicative of a minimalist approach (Sharpe, et al.2005; Tagayuna, et al.2005; Vogel, et al.1999).

Third, graduate students had a higher variation across institutions for the educational supports needed. This finding demonstrated how students with LD are a heterogeneous group. Although students with LD share similar characteristics associated with their disabilities, their learning profiles are different (NJCLD, 1994). It is suggested that students with LD become knowledgeable about their strengths and weaknesses as well as the educational supports offered in order to make informed decisions about which postsecondary educational institution to attend. Also, findings of this study demonstrated that less time-consuming supports were provided more frequently than more time-consuming supports. For example, faculty members were more likely to offer accommodations for test-taking when the office of disability services provided these services to students with LD (Vogel, 1999).

Additionally, despite the fact that graduate students are typically enrolled in academic degree programs longer than undergraduate students; they perceived the need for self-advocacy skills and counseling services. Findings from this study revealed that, once enrolled in undergraduate programs, students with LD failed to learn self-advocacy skills necessary for requesting educational supports. Therefore, students with LD failed to acquire knowledge about disability laws, educational supports that may be requested, and their own strengths and weaknesses (Stodden, et al., 2001). As a result, it is suggested that disability services focus on providing self-advocacy skill training to students with LD to help empower students when speaking with faculty about educational supports needed for completing university-level coursework (Graham-Smith & Lafayette, 2004).

Fourth, the educational supports provided to students with LD at institutions of higher education vary across institutions. Interestingly, findings from this study showed that educational supports provided to students with LD vary across large, public institutions. These findings demonstrated that institutions of higher education have different service delivery goals which influence the educational supports they provided to students with LD. For example, provisionary services may depend on whether institutions emphasized Section 504, compensatory learning strategies or basic skill remediation as evidenced in previous studies (Bursuck, et al., 1989). Variations across institutions related to the educational supports offered may also be a result of the extent to which disability services informs faculty about disability laws, services and resources available, and characteristics of students with LD (Vogel, et al., 1999). The exposure and experiences of faculty who have worked with students with LD may also affect the educational supports offered at institutions of higher education (Norton, 1997; Vogel, et al., 1999).

Finally, findings of this study confirmed Bronfenbrenner's ecological systems theory associated with how educational supports are provided at institutions of higher education. Bronfenbrenner's concentric circles can be applied to the findings of this study by describing students' perceptions regarding (a) limited educational supports at institutions of higher education, (b) negative faculty attitudes toward educational supports, (c) students' lack of knowledge about disability laws and the educational supports offered, and (d) disability services inability to hire adequate staff to implement educational supports. Therefore, the use of Bronfenbrenner's ecological systems theory demonstrates how interaction in the environment between the four main factors at institutions of higher education affects accessibility to educational supports for students with LD. As a result, findings in this study serves to confirm that collaboration between institutional administrators, faculty, students, and disability services is necessary in order to offer

students with LD the necessary educational supports for completing coursework and program requirements.

Conclusion

A discussion of educational supports for students with LD was presented to inform researchers and practitioners in the field of disabilities in higher education about current trends. The passage of the American with Disabilities Act of 1990 provided equal access for students with disabilities to institutions of higher education. Nonetheless, today improving access to educational supports for students with LD at institutions of higher education deserves equal attention. Students with LD are dependent on educational supports to achieve the same learning goals as their non-disabled peers. Therefore, there is a need to recognize the current role of educational supports in academic settings across institutions of higher education to help students with LD complete coursework and program requirements. Educational supports in postsecondary settings involve (a) institutions, (b) faculty, (c) students with LD, and (d) disability services.

Students with LD are to be provided educational supports at institutions of higher education as mandated by disability laws. The educational supports offered at institutions of higher education vary across institutions depending on size, type, and mission statement of the institution (Bursuck, et al., 1989; Hicks-Coolick & Kurtz, 1996; Nelson & Lignugaris-Kraft, 1989; Sharpe & Johnson, 2001). The variation of educational supports available at institutions of higher education affects students with LD. Students with LD entering institutions of higher education may need to consider if their academic needs are better served at a large public university, a small private college, or a two-year or four-year settings. As a result, the educational supports offered at institutions of higher education affect the extent to which students with LD are successful in completing academic degree programs.

In addition, faculty plays an important role with their willingness to provide educational supports to students with LD. Research had shown that faculty is willing to provide instructional and examination supports; accommodations that are less demanding and time consuming to arrange (Vogel, et al., 1999). Students with LD, however, need educational supports that are beyond those that are easily accessible (Elacqua, et al., 1996; Sharpe, et al., 2005). Unfortunately, faculty's reluctance to offer an array of educational supports may compromise the academic progress of students with LD. In fact, students with LD at institutions of higher education have struggled with academic requirements based on the reluctance of faculty to grant administrative supports (Elacqua, et al.). Yet, students with LD need administrative supports to help them fulfill program requirements (Dowrick, et al., 2005; Sharpe, et al.). As a result, disability services and academic departments may need to assist faculty in providing students with LD with an array of educational supports (Bourke, Strehorn, & Silver, 2000). In this way, the responsibility to provide students with educational supports is shared by the learning community.

Furthermore, there is a need to provide awareness about educational supports for students with LD at institutions of higher education. In-service programs for administrators, faculty, and students with LD are essential (Bourke, Strehorn, & Silver, 2000; Houck, et al., 1992). Disability services can offer seminars that contribute to faculty's knowledge about disability laws, characteristics of students with LD, and available educational supports (Vogel, et al., 1999). Similarly, disability services may offer a colloquium for students with LD to learn self-advocacy skills and procedures for requesting educational supports. Although the mission of disability services is to advocate on behalf of students with LD, providing in-service programs for faculty and students builds awareness about the need for educational supports throughout the learning

community (Bourke, et al., 2000). In this way, disability services are able to promote increased access to educational supports for students with LD at institutions of higher education.

Finally, institutions of higher education have made progress by improving the educational support services being offered to students with LD as a result of the passage of disability laws, yet there are opportunities for improvement. Further research is needed to explore educational supports from the perspective of institutions, faculty, and students with LD to learn how to improve services. Currently, there is no perfect system; however, research suggests that a collaborative effort among institutions, faculty, students, and disability services is warranted to help students with LD experience successful learning outcomes at institutions of higher education.

APPENDIX A
IRB FOR PILOT STUDY

UFIRB 02 – Social & Behavioral Research Protocol Submission	
Title of Protocol: A Comparison of the Educational Supports Needed and Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education	
Principal Investigator: Ailé Montoya	UFID #: 1311-1397
Degree / Title: MS.Ed./Doctoral Student Department: Department of Special Education	Mailing Address: P.O. BOX 117050 G-315 Norman Hall, Gainesville, Florida 32611-7050 Email Address & Telephone Number: Email: aile@ufl.edu , Phone: (786) 897-8873, Fax: (352) 392-2655
Co-Investigator(s): None	UFID#: Not Applicable
Supervisor: Holly Lane	UFID#: Not Applicable
Degree / Title: Ph.D./Associate Professor Department: Department of Special Education	Mailing Address: P.O. BOX 117050 G-315 Norman Hall, Gainesville, Florida 32611-7050 Email Address & Telephone Number: Email: hlane@ufl.edu , Phone: (352) 392-0701, ext. 246, Fax: (352) 392-2655
Date of Proposed Research: August 28, 2007 to August 28, 2008	
Source of Funding (<i>A copy of the grant proposal must be submitted with this protocol if funding is involved</i>): Unfunded	
Scientific Purpose of the Study: The purpose of this study is to (a) determine the types of educational support that undergraduate and graduate students with learning disabilities perceive as needed, (b) determine the types of educational support being provided for undergraduate and graduate students with learning disabilities, and (c) compare undergraduate and graduate students with learning disabilities to determine if these two groups differ in the types of educational support needed and supports provided for completion of coursework and program requirements.	
Describe the Research Methodology in Non-Technical Language: (<i>Explain what will be done with or to the research participant.</i>) Participants: The research participants in this study are undergraduate and graduate students with learning disabilities and will be recruited as volunteers. Setting: The research participants for this study are students at the University of Florida and University of	

Texas at Austin.

Methods: The preliminary stage of this study requires the development of a questionnaire. Therefore, this study requires the following pre-field and field methods to develop the instrument: (a) focus group interviews, (b) cognitive interviews, and (c) a preliminary version of a questionnaire concerning these issues. After the questionnaire is developed, a copy will be submitted to the IRB office for review and approval prior to implementing the research study.

Pre-field Methods

Focus Group Interviews. The focus group interviews will enable the researcher to explore the varying types of educational support perceived as needed and provided at institutions by interviewing students with learning disabilities. A total of six focus group interviews will be conducted. Three focus group interviews will consist of undergraduate and graduate students with learning disabilities respectively. The focus group interviews will include six to twelve students per group. During the focus group interviews students will be asked open-ended questions about the academic demands of their program of study, the types of educational support that they perceive are needed and provided at their institution, and their satisfaction with disability resources. Additionally, students will be asked to review a list of varying types of educational support and suggest the types of educational support that may be helpful to them in completing coursework and program requirements. Nonetheless, research participants do not have to answer any questions that s/he does not wish to answer. The focus group interviews will be transcribed, coded, and themed for analysis. The information gathered from the focus group interviews will be used to develop the questionnaire.

Cognitive Interviews. The cognitive interviews will allow the researcher to evaluate the respondent's comprehension of the questions, retrieval of information from memory, decision and response processes, technical accuracy of the questions, and structural problem in the questionnaire. A total of ten cognitive interviews will be conducted. The cognitive interviews will consist of five undergraduate and graduate students with learning disabilities respectively. The cognitive interviews will be implemented using think-aloud and verbal probing techniques. A combination of scripted and spontaneous probes will be used during the cognitive interviews. Research participants do not have to answer any questions that s/he does not wish to answer. The information gathered from the cognitive interviews will be used to make further revisions to the questionnaire.

Field Method

Pilot Test. The questionnaire will be administered under the same condition to be implemented in the proposed research study. The questionnaire will be electronically mailed to a sample of 300 undergraduate and graduate students with learning disabilities. The questionnaire to be used will provide an open-ended question eliciting responses from research participants as to the level of ease and difficulty in responding to questions. Also, research participants will be asked to provide suggestions for improving the design of the questionnaire. The results of a preliminary version of a questionnaire concerning these issues will be used to obtain an estimate of response rate, percentage of ineligible, problems with skipping patterns, inadequate response categories, and problems with questionnaire length. The information gathered from a preliminary version of a questionnaire concerning these issues will be used to make final revisions to the questionnaire, therefore the development of the questionnaire will conclude with this procedure.

Data Collection and Storage. The interviews will be held at the office of Disability Resource Center. The research participant will be asked to participate in one or more of the above methods. The focus group interviews and cognitive interviews will be tape-recorded. During the focus group interviews, research participants will be asked to keep the names of all research participants and information they share confidential, thus not to be discussed outside of the focus group session. The tapes will be transcribed by the principal investigator and stored in locked files. During the transcription of the tapes, a pseudonym will be used for the names of each research participant to maintain confidentiality. Also, data collected during the administration of a preliminary version of a questionnaire concerning these issues will be stored in a computer database with a security password. During the administration of a preliminary version of a questionnaire concerning these issues, each research participant will be assigned a numerical code. The list connecting the research participant to the numerical code will be kept in a locked file. When

the study is completed and the data have been analyzed, the tapes and list will be destroyed. The identity of the research participant will be kept confidential to the extent provided by law.

Describe Potential Benefits and Anticipated Risks: *(If risk of physical, psychological or economic harm may be involved, describe the steps taken to protect participant.)* This investigation poses no known risks and there are no direct benefits to the research participants.

Describe How Participant(s) Will Be Recruited, the Number and AGE of the Participants, and Proposed Compensation: All research participants will be recruited through the office of Disability Resource Center to allow for their personal information to be kept confidential. A flyer will be used to recruit research participants. The total number of participants is 382 and they must be over the age of 18+ years old. There is no proposed compensation for participating in the research study.

Describe the Informed Consent Process. Include a Copy of the Informed Consent Document: At the time of recruitment, the office of Disability Resource Center will provide research participants with the informed consent letter to be signed. A copy of the informed consent letter will be provided to research participants for their records. Prior to participating in the study, research participants will be provided one week to review the informed consent form and ask questions. Thereafter, research participants will be reminded of the informed consent process at the beginning of each focus group interview, cognitive interview, and administration of a preliminary version of a questionnaire concerning these issues. All original informed consent letters will be filed and stored for at least three years beyond completion of data collection. Additionally, a research chart as provided by the UF IRB web-site will be used to document the informed consent process for each research participant.

Informed Consent

Protocol Title: A Comparison of the Educational Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:

The purpose of this study is to assess the types of accommodation that undergraduate and graduate students with learning disabilities perceive as needed and are being provided in college.

What you will be asked to do in the study:

The principal investigator of this study, a graduate student in special education will be administering the procedure of this study. You will be asked to participate in one or more activities that involve research as follows: cognitive interviews and completing a preliminary version of a questionnaire concerning these issues. The purpose is to develop a questionnaire that will be used in a future research study. First, cognitive interviews will be conducted individually and you will be asked to complete a questionnaire. As you complete the questionnaire, you will be asked either specific questions or to think-aloud as you respond to questions. In this session, you will be asked to provide suggestions for improving the design of the questionnaire. Second, a preliminary version of a questionnaire concerning these issues will be administered on-line through electronic mail where you will be asked to complete and submit the questionnaire. During the administration of a preliminary version of a questionnaire concerning these issues, you will be asked questions regarding the topic of academic demands, accommodations, and satisfaction with disability services. Nonetheless, you do not have to answer any questions that you do not wish to answer during cognitive interviews and completing the on-line questionnaire.

Time required:

30 minutes (cognitive interview), 20 minutes (on-line questionnaire)

Where and when the study will take place:

The cognitive interviews will be held at the office of Disability Resource Center during the spring 2008 semester. The on-line questionnaire will be administered during the spring or fall 2008 semester.

Risks and Benefits:

There are no known risks, or benefits for participating in this research study.

Compensation:

There is no proposed compensation for participating in the research study.

Confidentiality:

Your identity will be kept confidential to the extent provided by law. Only the researchers involved in this study will have access to your research records. During the administration of a preliminary version of a questionnaire concerning these issues, your information will be assigned a numerical code. The list connecting your name to this number will be kept in a locked file. Data collected during the administration of a preliminary version of a questionnaire concerning these issues will be stored in a computer database with a security password. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report.

Whom the results of the study will be shared:

The results of this study may be shared at meetings, conferences, and published journals in the field of education among people that are interested in improving disability services for students with learning disabilities in college.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty for not participating. Whether or not you decide to participate in this study will not affect your rights to request or continue to receive varying types of educational support through the office of Disability Resource Center.

Right to withdraw from the study:

You have the right to withdraw from the study at anytime without consequence.

Whom to contact if you have questions about the study:

Ailé Montoya, Doctoral Student, Principal Investigator, Department of Special Education, University of Florida, P.O. Box 117050 G-215 Norman Hall, Gainesville, Florida 32611-7050, (786) 897-8873, aile@ufl.edu.

Holly Lane, Ph.D., Associate Professor, Supervisor, Department of Special Education, University of Florida, P.O. Box 117050 G-315 Norman Hall, Gainesville, Florida 32611-7050.

Whom to contact about your rights as a research participant in the study:

IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

Disability Resource Center

Students with Learning Disabilities

Undergraduate and graduate students with learning disabilities are being recruited to participate in a research study concerning their experiences in college. This project will help develop a questionnaire for future research studies. Students may participate in individual interviews and/or complete a questionnaire.

Discussion Topics:

- Academic Demands
- Accommodations
- Satisfaction with Disability Services

If you would like more information or are interested in participating, please contact Ailé Montoya at aile@ufl.edu.

This project is being sponsored by the office of Disability Resource Center.

IRB'S FOR DISSERTATION STUDY

UFIRB 02 – Social & Behavioral Research Protocol Submission	
Title of Protocol: A Comparison of the Educational Supports Needed and Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education	
Principal Investigator: Ailé Montoya	UFID #: 1311-1397
Degree / Title: MS.Ed./Doctoral Candidate Department: Department of Special Education, School Psychology & Early Childhood	Mailing Address: P.O. BOX 117050 / 1403 Norman Hall, Gainesville, Florida 32611-7050 Email Address & Telephone Number: Email: ail@ufl.edu , Phone: (786) 897-8873, Fax: (352) 392-2655
Co-Investigator(s): None	UFID#: Not Applicable
Supervisor: Holly Lane	UFID#: Not Applicable
Degree / Title: Ph.D./Associate Professor Department: Department of Special Education, School Psychology & Early Childhood	Mailing Address: P.O. BOX 117050 / 1403 Norman Hall, Gainesville, Florida 32611-7050 Email Address & Telephone Number: Email: hlane@ufl.edu , Phone: (352) 392-0701, ext. 246, Fax: (352) 392-2655
Date of Proposed Research: January 6, 2009 to January 6, 2010	
Source of Funding (<i>A copy of the grant proposal must be submitted with this protocol if funding is involved</i>): Unfunded	
Scientific Purpose of the Study: The purpose of this study is to (a) determine the types of educational supports that undergraduate and graduate students with learning disabilities perceive as needed, (b) determine the types of educational supports being provided for undergraduate and graduate students with learning disabilities, and (c) compare undergraduate and graduate students with learning disabilities and identify their similarities and differences in the types of educational supports needed and supports provided for completion of coursework and program requirements.	
Describe the Research Methodology in Non-Technical Language: (<i>Explain what will be done with or to the research participant.</i>) Participants: The research participants in this study are undergraduate and graduate students with learning disabilities and will be recruited as volunteers. Settings: The research participants for this study are students with learning disabilities currently enrolled at institutions of higher education located in the United States. Eleven institutions are participating in this study as follows: University of Michigan at Ann-Harbor, Texas A & M University at College Station,	

University of Iowa, University of Alabama, University of California at Irvine, Iowa State University, University of Missouri, Louisiana State University at Baton Rouge, and University of Oregon.

Methods: The protocol and informed consent will be sent to each educational institution IRB and disabilities office where the study will be conducted before beginning the study. The questionnaire, "Educational Supports in Higher Education," to be used for this study is being submitted to the IRB office for review and approval. The implementation of the questionnaire concerning these issues and data collection require the following procedures:

Questionnaire Implementation. The questionnaire concerning these issues will be mailed to the IRB office for approval prior to implementing the study. The present study will be implemented over a period of three weeks. This study requires for disability service coordinators at each of the ten institutions to disseminate the questionnaire. The questionnaire will be implemented using electronic mail. Survey Monkey.com, a web-based service company will be used to host the on-line questionnaire and collect data (Finley). Dillman (2005) explains that Internet questionnaires require four consecutive contacts with research participants to increase response rates with a return rate of 49%. Four consecutive contacts will be made with research participants in the following order: (a) pre-notice letter with the attached informed consent, (b) cover letter with the attached questionnaire, (c) reminder notice, and (d) re-sending the questionnaire. The questionnaire will be electronically mailed only to non-respondents on the second attempt.

The questionnaire will be disseminated in the following order: First, the disability service coordinators at the ten institutions will electronically mail a pre-notice letter with the attached informed consent explaining to research participants the purpose of the study, procedures to be followed, and the importance of their participation. Research participants will be informed that participation in the study is voluntary and will not affect their rights to request, receive approval of, or continue to receive educational support services through the office of disability services. This statement will be specifically stated in each corresponding email to the research participant in order to decrease any risk of coercion that participants may feel regarding their services being dependent upon participating in this research study. Research participants will also be informed that recruitment of their participation is being done through disability services to allow for research participants to be kept anonymous to the researcher and for their personal information to be kept confidential. Second, two days after the pre-notice letter, disability service coordinators will electronically mail to research participants a cover letter with a hyperlink to the on-line questionnaire. The cover letter will explain the purpose of the study, the importance of their participation, their agreement to participate in the study, and how to answer questions and submit the questionnaire. Research participants will be requested to complete and submit the survey within three days. The cover letter will also inform research participants about earning an incentive, a five-dollar gift certificate to the university bookstore for the first, middle, and last ten respondents to complete and submit the questionnaire. Additionally, the cover letter will include my contact information inviting them to contact me for further questions as needed. Third, disability service coordinators will electronically mail a reminder notice three days after the initial questionnaire is mailed to remind research participants to complete and submit the questionnaire. Last, disability service coordinators will re-send a cover letter with a hyperlink to the on-line questionnaire informing non-respondents of their last opportunity to complete and submit the questionnaire.

During the administration of a questionnaire concerning these issues, students with dyslexia and/or ADHD will need to seek their own accommodations as necessary to complete the questionnaire. Also, students may download a free trial of the software Read Please at www.readplease.com to assist them in reading the questionnaire concerning these issues.

Data Collection and Storage. The research participant will be asked to participate in a questionnaire concerning these issues. Data collected during the administration of a questionnaire concerning these issues will be stored in a computer database with a security password. During the administration of a questionnaire concerning these issues, the computer software (Survey Monkey) assigns a numerical code to each participants email address in order to track duplicate responses. However, there is no link between the student's identity and their corresponding answers, therefore the identity of each research participant are unknown and remain anonymous. When the study is completed and the data have been analyzed, the survey responses will be destroyed. The identity of the research participant will be kept confidential to the extent provided by law.

Describe Potential Benefits and Anticipated Risks: *(If risk of physical, psychological or economic harm may be involved, describe the steps taken to protect participant.)* This research investigation poses the following known risks: (a) Research participants may feel coerced to participate in this study as a result of being recruited through the office of disability services upon which educational support services are provided; (b) research participants choosing to be considered for compensation may result in waiving their rights to remain anonymous; (c) research participants are responsible for seeking their own accommodations as necessary to complete the questionnaire concerning these issues and, therefore, there is no guarantee that research participants will receive necessary accommodations; (d) the results of this study will be shared at meetings, conferences, and published journals in the field of education among people that are interested in improving disability services for students with learning disabilities in college; and (e) individual participant responses may be shared without identifiers. There are no direct benefits to the research participants.

Describe How Participant(s) Will Be Recruited, the Number and AGE of the Participants, and Proposed Compensation: All research participants will be recruited through the office of Disability Resource Center to allow for their personal information to be kept confidential. Electronic mail will be used to recruit research participants. The total number of participants is 10,000 and they must be over the age of 18+ years old. The proposed compensation for this study includes the following: The first, middle, and last ten respondents to complete and submit the questionnaire will be eligible to receive a five dollar gift certificate to be used at the university bookstore. The use of an incentive in survey research serves to increase the response rate. Therefore, it is important that all research participants are informed of the incentive that is being offered for their participation. The reasons for which the first, middle, and last respondents are chosen for compensation is to offer all respondents with an equal opportunity to earn the incentive. Otherwise, offering an incentive solely to early respondents may deter research participants who receive the follow-up reminders from completing the questionnaire. Similarly, offering an incentive to solely the middle and/or last respondents may result in those who may have otherwise been early responders to avoid completing the questionnaire during initial contact.

Describe the Informed Consent Process. Include a Copy of the Informed Consent Document: The Disability Resource Center will provide research participants with the informed consent letter along with the pre-notice letter during initial contact. A copy of the informed consent letter will be provided to research participants for their records. Prior to participating in the study, research participants will be provided two days to review the informed consent form and ask questions. Thereafter, research participants will be reminded of the informed consent process during each administration of the questionnaire concerning these issues. Research participants will be informed that clicking on the web-link to access the questionnaire automatically confirms their consent to participate in the research study. The original informed consent letter will be filed and stored for at least three years beyond completion of data collection.

APPENDIX B
UNIVERSITY RECRUITMENT LETTER

Director of Disability Services
Recruitment Letter

Dear Director of Disability Services,

I am a doctoral candidate at the University of Florida. Currently, I am writing to ask of your support for my dissertation study. The purpose of this study is to compare undergraduate and graduate students with learning disabilities and identify their similarities and differences in the types of educational supports needed and supports provided for completion of coursework and program requirements. This study requires that directors of disability services electronically mail an online survey to all students with learning disabilities registered with the office of disability services. The survey will be electronically mailed to you, at which time you will need to electronically send it to your list-serve. Survey studies require specific procedures including follow-up contact with participants; therefore, you will be asked to electronically mail participants four consecutive times over a period of two weeks. This study is to be implemented in the spring semester of 2009. This study will be seeking IRB approval at the University of Florida and each participating educational institution prior to implementation. The identity of all student participants in this study will be kept confidential to the extent provided by law. If this research study is of interest to you, after all of the data has been collected and analyzed I will be more than happy to share the results with you. Ultimately, the purpose of my work is to help improve access to educational programs for students with learning disabilities in postsecondary settings.

Please note that your institution was selected to participate in this study for the following reasons: (a) large enrollment sizes, (b) ranked among the top 130 institutions in the nation, and (c) diversity of the student body. If you are interested in participating in this study, please let me know. If you know of any other directors of disability services that may be interested in participating, please feel free to pass along this information to them. Please feel free to ask any questions regarding this research study by contacting me at any time at ailemontoya@gmail.com or 786-897-8873.

Your support is priceless and very much appreciated.

Best Regards,

Ailé Montoya
Doctoral Candidate
Department of Special Education
University of Florida
P.O. Box 117050/ 1403 Norman Hall
Gainesville, Florida 32611-7050

APPENDIX C EXPERT REVIEW PROTOCOL

Directions: The following outline and questions has been developed to help you evaluate the questionnaire. Dillman, D. A. (2005) *Mail and Internet Surveys: The Tailored Design Method*. John Wiley and Sons, Inc.: Hoboken, NJ.

Design

- Clarity:
 - Directions
 - Individual Questions (word choices/grammar)
 - Relevance of Demographic Information

- Attractiveness:
 - Background Color
 - Font Size & Style

- Time to Complete:
 - Level of Ease & Difficulty
 - Length of Page (e.g., all sets of questions fit in view of a computer screen whether it is a desktop or laptop – split page one into two?)
 - Length of Questionnaire (e.g., estimated time to complete)

Questions to Evaluate Survey Items:

1. Does the question require an answer?
2. To what extent do survey recipients already have an accurate, ready-made answer to the question?
3. Can people accurately recall and report past behaviors?
4. Is the respondent willing to reveal the requested information?
5. Will the respondent feel motivated to answer each question?
6. Is the respondent's understanding of response categories likely to be influenced by more than words?
7. Is the survey information being collected by more than one mode? (No)
8. Is changing the question acceptable to the survey sponsor?

Questions to Evaluate Survey Design:

1. Does the questions look important?
2. How do you think the respondents will perceive the importance of this survey?
3. Does the question look easy to respond?
4. Can the person understand the question precisely?

Questions to Evaluate Survey Pre-testing:

Content

1. Are all questions technically accurate?
2. Are the answer choices of each question appropriate?
3. Is the meaning of the question clear to all respondents?
4. Are all the words in the question accurate?
5. Does the information obtained by the question serve the goals of the survey?
6. Are the respondents able to provide an answer to all questions?
7. Are the respondents likely to be confused with any question?
8. Are the respondents likely to have objections to any of the questions?
9. Is any question not necessary?
10. Does the question yield responses with adequate variability?

Order Effects

1. Are the responses to any question affected by the previous question(s)?

Formatting

1. Does the formatting allow clear navigation between and within questions?
2. Does the formatting make the questionnaire look easy to respond?
3. Does the formatting allow individuals to see all instructions and response options of a question?

Skip Instructions

1. Are individuals seeing the skip instructions? (Not applicable)
2. Are individuals following the skip instructions correctly? (Not applicable)

COGNITIVE INTERVIEW PROTOCOL

Directions: Please read each item on the survey to yourself and talk aloud as you answer the questions. Verbalize any thoughts that you may have as you go through this process. Allow me to model for you, for example, "I like the colors of this questionnaire." You may express any thoughts; your responses will help us improve the questionnaire.

Content:

1. Explain what the directions are asking you to do in this questionnaire.
2. Are the directions clear to you?
3. Did you find any of the questions to be unclear?
4. Are any of the accommodations listed confusing to you?
5. Would you like to add other accommodations that are not listed on this questionnaire?

Appearance:

1. Would you describe the length of the questionnaire as long, short, or just right?
2. On a scale from 1 to 10, rate the attractiveness of this questionnaire.
3. On a scale from 1 to 10, rate the ease of this questionnaire.
4. On a scale from 1 to 10, if you received this questionnaire through email, how willing would you be in completing it?
5. Would you like to provide any comments or suggestions to improve this questionnaire? If so, what are they?

APPENDIX D
ELECTRONIC LETTERS

MAR. 17. 2009 3:34PM

UNIV. FL/SPECIAL EDU

NO. 575 P. 9

Pre-Notice Letter

Dear Students,

We are contacting you because you are a student registered with Disability Resources. Within the next couple of days, you will receive an email from the Director of Disability Resource Center asking for your participation in a research survey about accommodations for students with learning disabilities in college. The purpose of this study is to assess the types of accommodations that undergraduate and graduate students with learning disabilities are provided and perceive as needed to complete coursework and program requirements. We are writing in advance because many people like to know ahead of time that they will be contacted. We would like to ask that you consider participating in this survey because it is an important project that may have benefits for students with learning disabilities in the future.

If you choose to participate in this survey, your answers are completely anonymous and will only be reported as part of group summaries. Additionally, your participation will not affect your status to request or receive accommodations through the office of Disability Resources.

To participate in this survey, please click on the link provided at the end of this e-mail message in the coming days. This survey will take approximately 20 minutes to complete. You will have three days to complete and submit the survey. The first, middle, and last ten students to complete and return the questionnaire will be eligible to receive a five-dollar gift certificate to be used at the university bookstore. Your participation in this research study is voluntary and a description of this research study is being provided to you.

If you have any questions or comments about this research project, please feel free to contact us at 786-897-8873 or ailemontoya@mac.com.

Sincerely,

Ailé Montoya
Doctoral Student
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
(352) 392-0701 x262

Holly Lane
Associate Professor
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
(352) 392-0701 x246

Approved by
University of Florida
Institutional Review Board 02
Protocol # 2008-U-1071
For Use Through 02/18/2010

Cover Letter

Dear Students,

We are writing to ask you to participate in a survey about accommodations for students with learning disabilities in college. The Department of Special Education in conjunction with Disability Resources are working on understanding the types of accommodations that students with learning disabilities are provided and perceive as needed to complete coursework and program requirements. The purpose of our survey is to collect information to evaluate whether or not colleges are meeting the educational needs of students with learning disabilities. Your participation in this research study is very important to improve accommodations for students with learning disabilities in college.

We are contacting you because you are a student registered with Disability Resources. If you choose to participate in this survey, your answers are completely anonymous and will only be reported as part of group summaries. Additionally, your participation will not affect your status to request or receive accommodations through the office of Disability Resources.

To participate in this survey, please click on the link provided at the end of this e-mail message. This survey will take approximately 20 minutes to complete. Please complete and submit the survey within three days. The first, middle, and last ten students to complete and return the questionnaire will be eligible to receive a five-dollar gift certificate to be used at the university bookstore. I voluntarily agree to participate in the procedure and I have received a copy of this description. I offer my consent to participate in this study by clicking on the web-link to access the questionnaire that has been electronically mailed to my email address through the office of Disability Resource Center.

Web-Survey Link: http://www.surveymonkey.com/s.aspx?sm=6ckX79zuIL6VaFtx2GTkvg_3d_3d

Please accept our sincere thanks for your participation. It is only with the help of students like you that accommodations for students with learning disabilities in college can be improved. If you have any questions or comments about this survey, please feel free to contact us at 786-897-8873 or ailmontoya@gmail.com.

Sincerely,

Ailé Montoya
Doctoral Student
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
(352) 392-0701 x262

Holly Lane
Associate Professor
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
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Second Reminder Email

Dear Students,

We are writing to remind you to complete the "Educational Supports in Higher Education" survey. We know that students are busy and find it difficult to answer questions. However, your participation in this survey is very important because it will allow for colleges to evaluate the types of accommodations that they provide to students with learning disabilities based on what students perceive is needed.

If you choose to participate in this survey, your answers are completely anonymous and will only be reported as part of group summaries. Additionally, your participation will not affect your status to request or receive accommodations through the office of Disability Resources.

To participate in this survey, please click the link provided below. This survey should take approximately 20 minutes to complete. Please complete and submit the survey within three days. The first, middle, and last ten students to complete and return the questionnaire will be eligible to receive a five-dollar gift certificate to be used at the university bookstore. I voluntarily agree to participate in the procedure and I have received a copy of this description. I offer my consent to participate in this study by clicking on the web-link to access the questionnaire that has been electronically mailed to my email address through the office of Disability Resource Center.

Web-Survey Link: http://www.surveymonkey.com/s.aspx?sm=6ckX79zuIL6VaFtx2GTkvg_3d_3d

Thank you very much for assisting with this important research project. If you have any questions or comments about this survey, please feel free to contact us at 786-897-8873 or ailemontoya@mac.com.

Sincerely,

Ailé Montoya
Doctoral Student
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
(352) 392-0701 x262

Holly Lane
Associate Professor
Department of Special Education
P. O. Box 117050 / G315 Norman Hall
Gainesville, FL 32611
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Informed Consent

Protocol Title: A Comparison of the Educational Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:

The purpose of this study is to assess the types of accommodations that undergraduate and graduate students with learning disabilities perceive as needed and are being provided in college.

What you will be asked to do in the study:

The principal investigator of this study, a graduate student in special education will be administering the procedure of this study. You will be asked to participate in completing a questionnaire concerning these issues that involves research. The questionnaire concerning these issues will be administered on-line through electronic mail where you will be asked to complete and return the questionnaire. The purpose is to identify the varying types of educational supports provided and needed to complete coursework and program requirements in college. During the administration of the questionnaire concerning these issues, you will be asked specific questions regarding instructional, examination, and administrative supports that may have been offered to you as well as you may find to be beneficial in college. These are multiple-choice questions in which there is no right or wrong answers. Also, you will be asked a few questions regarding your experiences with disability services in requesting and receiving accommodations. These are open-ended questions requiring short-answer responses in which there is no right or wrong answers. Additionally, you will be asked a few demographic questions. Nonetheless, you do not have to answer any questions that you do not wish to answer when completing the on-line questionnaire concerning these issues.

Time required:

20 minutes

Where and when the study will take place:

The on-line questionnaire will be electronically mailed to you through the office of Disability Resource Center during the spring 2009 semester.

Risks and Benefits:

This research investigation poses the following known risks: (a) You may feel coerced to participate in this study as a result of being recruited through the office of disability services upon which educational support services are provided; (b) choosing to be considered for compensation may result in waiving your rights to remain anonymous; (c) you are responsible for seeking your own accommodations as necessary to complete the questionnaire concerning these issues and therefore there is no guarantee that you will receive necessary accommodations; (d) the results of this study will be shared at meetings, conferences, and published journals in the field of education among people that are interested in improving disability services for students with learning disabilities in college; and (e) individual participant responses may be shared without disclosing your identity. There are no direct benefits to the research participants.

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Compensation:

The first, middle, and last ten students to complete and return the questionnaire will be eligible to receive a five dollar gift certificate to be used at the university bookstore.

Confidentiality:

Your identity will be kept confidential to the extent provided by law. Only the researchers involved in this study will have access to your research records. During the administration of the questionnaire concerning these issues, your information will be assigned a numerical code. The computer software program Survey Monkey automatically assigns the numerical code and therefore your identity is unknown to the researcher. Data collected during the administration of the questionnaire concerning these issues will be stored in a computer database with a security password. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report.

Whom the results of the study will be shared:

The results of this study may be shared at meetings, conferences, and published journals in the field of education among people that are interested in improving disability services for students with learning disabilities in college. Also, individual participant responses may be shared without disclosing your identity.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty for not participating. Whether or not you decide to participate in this study will not affect your rights to request or continue to receive varying types of educational supports through the office of Disability Resource Center. However, because your participation in this study is voluntary, you are responsible for seeking your own accommodations as necessary to complete the questionnaire concerning these issues. Also, you may download a free trial of the software Read Please at www.readplease.com to assist you in reading the questionnaire concerning these issues.

Right to withdraw from the study:

You have the right to withdraw from the study at anytime without consequence.

Whom to contact if you have questions about the study:

Ailé Montoya, Doctoral Student, Principal Investigator, Department of Special Education, University of Florida, P.O. Box 117050 / 1403 Norman Hall, Gainesville, Florida 32611-7050, (786) 897-8873, ailmontoya@gmail.com.

Holly Lane, Ph.D., Associate Professor, Supervisor, Department of Special Education, University of Florida, P.O. Box 117050 / 1403 Norman Hall, Gainesville, Florida 32611-7050.

Whom to contact about your rights as a research participant in the study:

IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250; phone 392-0433.

Agreement:

I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description. I offer my consent to participate in this study by clicking on the web-link to access the questionnaire that has been electronically mailed to my email address through the office of Disability Resource Center.

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APPENDIX E
SURVEY

Educational Supports in Higher Education

1. Demographic Information

* 1. What is your academic program?

- Undergraduate
- Graduate

2. What is your degree seeking status?

3. What is your major?

* 4. What is your disability?

- LD
- LD/ADHD
- Other

Other (please specify)

* 5. What is the name of your college?

6. What is your enrollment status?

- Full-time
- Half-time

7. What is your gender?

- Male
- Female

8. What is your age?

9. What is your race?

Other (please specify)

10. Have you previously received academic accommodations?

- Yes
- No

Educational Supports in Higher Education

11. Are you currently receiving academic accommodations?

Yes

No

Educational Supports in Higher Education

2. Instructional Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

12. Accommodations for Class Lectures

	Needed	Provided
Preferential seating	<input type="checkbox"/>	<input type="checkbox"/>
Changing the delivery of instruction	<input type="checkbox"/>	<input type="checkbox"/>
Review of lecture	<input type="checkbox"/>	<input type="checkbox"/>
Review of assignments	<input type="checkbox"/>	<input type="checkbox"/>
Explain or clarify directions	<input type="checkbox"/>	<input type="checkbox"/>

13. Accommodations for Class Notes

	Needed	Provided
Copies of overhead or notes	<input type="checkbox"/>	<input type="checkbox"/>
Outlines of lectures	<input type="checkbox"/>	<input type="checkbox"/>
Writing key concepts and assignments on the board	<input type="checkbox"/>	<input type="checkbox"/>
Note takers	<input type="checkbox"/>	<input type="checkbox"/>
Tape record lectures	<input type="checkbox"/>	<input type="checkbox"/>

Educational Supports in Higher Education

3. Instructional Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

14. Accommodations for Class Assignments

	Needed	Provided
Comment on draft of papers	<input type="checkbox"/>	<input type="checkbox"/>
Extra credit assignments	<input type="checkbox"/>	<input type="checkbox"/>
Allowing tape recording of assignments rather than written assignments	<input type="checkbox"/>	<input type="checkbox"/>
Provide additional time to complete assignment	<input type="checkbox"/>	<input type="checkbox"/>
Complete an assignment in alternative format	<input type="checkbox"/>	<input type="checkbox"/>
Use of proofreader	<input type="checkbox"/>	<input type="checkbox"/>
Allowing misspellings, incorrect grammar or punctuation	<input type="checkbox"/>	<input type="checkbox"/>

Educational Supports in Higher Education

4. Instructional Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

15. Accommodations for Reading and Writing

	Needed	Provided
Readers	<input type="checkbox"/>	<input type="checkbox"/>
Taped reading materials	<input type="checkbox"/>	<input type="checkbox"/>
Reading center	<input type="checkbox"/>	<input type="checkbox"/>
Scribers	<input type="checkbox"/>	<input type="checkbox"/>
Specialized writing instruction	<input type="checkbox"/>	<input type="checkbox"/>
Writing center	<input type="checkbox"/>	<input type="checkbox"/>

16. Services and Resources Available for Academic Development

	Needed	Provided
Development of study skills	<input type="checkbox"/>	<input type="checkbox"/>
Time management	<input type="checkbox"/>	<input type="checkbox"/>
Learning strategies	<input type="checkbox"/>	<input type="checkbox"/>
Subject tutoring	<input type="checkbox"/>	<input type="checkbox"/>
One-to-one-assistance	<input type="checkbox"/>	<input type="checkbox"/>

Educational Supports in Higher Education

5. Instructional Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

17. Assistive Technology Accommodations

	Needed	Provided
Learning to use computer software	<input type="checkbox"/>	<input type="checkbox"/>
Use of calculator	<input type="checkbox"/>	<input type="checkbox"/>
Use of word processor	<input type="checkbox"/>	<input type="checkbox"/>
Use of spell checker	<input type="checkbox"/>	<input type="checkbox"/>
Communicating with instructor via e-mail	<input type="checkbox"/>	<input type="checkbox"/>
Access to assistive technology lab	<input type="checkbox"/>	<input type="checkbox"/>
Access to staff trained in assistive technology	<input type="checkbox"/>	<input type="checkbox"/>
Access to specialized software (If needed/provided go to 17)	<input type="checkbox"/>	<input type="checkbox"/>
Assistive technology loan program (If needed/provided go to 18)	<input type="checkbox"/>	<input type="checkbox"/>

18. Specialized Software Name(s)

19. Types of Assistive Technology Loaned

Educational Supports in Higher Education

6. Examination Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

20. Testing and Exam Accommodations

	Needed	Provided
Extended-time on exams	<input type="checkbox"/>	<input type="checkbox"/>
Take exams in a quiet room with proctor	<input type="checkbox"/>	<input type="checkbox"/>
Frequent breaks during exam	<input type="checkbox"/>	<input type="checkbox"/>
More frequent exams covering less amounts of material	<input type="checkbox"/>	<input type="checkbox"/>
Allowing to answer oral rather than written questions	<input type="checkbox"/>	<input type="checkbox"/>
Use of multiple-choice questions rather than essay questions	<input type="checkbox"/>	<input type="checkbox"/>
Tape recording responses to exam questions	<input type="checkbox"/>	<input type="checkbox"/>
Test questions worded in a simplified manner	<input type="checkbox"/>	<input type="checkbox"/>
Replacing the lowest score with a paper	<input type="checkbox"/>	<input type="checkbox"/>
Assist in preparing of exams	<input type="checkbox"/>	<input type="checkbox"/>
Offer partial credit for using correct processes in math problems	<input type="checkbox"/>	<input type="checkbox"/>

Educational Supports in Higher Education

7. Administrative Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

21. Services Available for Guidance and Support

	Needed	Provided
Self-advocacy skills	<input type="checkbox"/>	<input type="checkbox"/>
Summer orientation program	<input type="checkbox"/>	<input type="checkbox"/>
Faculty mentors	<input type="checkbox"/>	<input type="checkbox"/>
Counseling services	<input type="checkbox"/>	<input type="checkbox"/>

22. Financial Support Opportunities

	Needed	Provided
Disability specific scholarships	<input type="checkbox"/>	<input type="checkbox"/>
Graduate fellowship or assistantship not contingent on course load requirement	<input type="checkbox"/>	<input type="checkbox"/>
Graduate fellowship or assistantship not contingent on standardized test score	<input type="checkbox"/>	<input type="checkbox"/>

23. Accommodations for Program Requirements

	Needed	Provided
Reduced course-load	<input type="checkbox"/>	<input type="checkbox"/>
Extended-time to complete degree requirements	<input type="checkbox"/>	<input type="checkbox"/>
Course waiver	<input type="checkbox"/>	<input type="checkbox"/>
Course Substitution	<input type="checkbox"/>	<input type="checkbox"/>

List course waiver/substitution if needed/provided.

Educational Supports in Higher Education

8. Administrative Supports

Directions: Check whether or not each accommodation is (a) needed and (b) provided to help you complete coursework and program requirements. Please check both boxes (left column, "needed" and right column, "provided") for each question.

24. Accommodations for Course Registration and Scheduling

	Needed	Provided
Priority registration	<input type="checkbox"/>	<input type="checkbox"/>
Early registration	<input type="checkbox"/>	<input type="checkbox"/>
Priority course scheduling	<input type="checkbox"/>	<input type="checkbox"/>
Modified schedule	<input type="checkbox"/>	<input type="checkbox"/>
Withdrawing from a course after the usual cut-off date	<input type="checkbox"/>	<input type="checkbox"/>

25. Accommodations for Transition to Employment

	Needed	Provided
Transfer supports to post-graduate employment	<input type="checkbox"/>	<input type="checkbox"/>
School-to-work programs	<input type="checkbox"/>	<input type="checkbox"/>
Internships and job training	<input type="checkbox"/>	<input type="checkbox"/>
Learning to use assistive technology devices specific to employment	<input type="checkbox"/>	<input type="checkbox"/>

Educational Supports in Higher Education

9. Educational Supports

26. What other types of accommodations do you feel are necessary for you to successfully complete coursework and program requirements?

27. Was it difficult to obtain academic accommodations?

Yes

No

If yes, explain.

28. What academic difficulties did you have prior to receiving accommodations?

29. Briefly describe whether or not the accommodations were helpful to you.

30. Any other comments:

Educational Supports in Higher Education

10. Optional: Contact Information

31. Optional: If you would like to be considered for compensation for your voluntary participation in this research study, please provide your contact information below.

First Name	<input type="text"/>
Last Name	<input type="text"/>
Address	<input type="text"/>
City	<input type="text"/>
State	<input type="text"/>
Zip Code	<input type="text"/>

APPENDIX F
INFORMED CONSENT

Office for Research
Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
R E S E A R C H

April 22, 2009

Aile Montoya
University of Florida- Department of Special Education
P.O. Box 117050/1403 Norman Hall
Gainesville, FL 32611-7050

Re: IRB#: 09-OR-127, A Comparison of the Educational Supports Needed and Provisions Provided for Undergraduate and Graduate Students

Dear Ms. Montoya:

The University of Alabama Institutional Review Board has granted approval for your proposed research

Your application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

Your application will expire on April 22, 2010. You will receive a notice of the expiration date 90 days in advance. If your research will continue beyond this date, complete the relevant portions of Continuing Review and Closure Form. If you wish to modify the application, complete the Modification of an Approved Protocol. When the study closes, complete the appropriate portions of the Continuing Review and Closure Form.

Please use reproductions of the IRB approved consent and assent forms to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,


Carpentato T. Myles, MSM, CIM
Director of Research Compliance & Research Compliance Officer
Office of Research Compliance
The University of Alabama



152 Rose Administration Building
Box 870117
Tuscaloosa, Alabama 35487-0117
(205) 348-5152
FAX (205) 348-8982

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office of Research Assurances
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

DATE: 4 March 2009

TO: Aile Montoya
Department of Special Education
PO Box 117050 / G315 Norman Hall
Gainesville, FL 32611

CC: Dr. Holly Lane
Department of Special Education
PO Box 117050 / G315 Norman Hall
Gainesville, FL 32611

FROM: Jan Canny, IRB Administrator
Office of Research Assurances

TITLE: A Comparison of the Educational Supports Needed and Provisions Provided
for Undergraduate and Graduate Students with Learning Disabilities in
Higher Education

ISU IRB ID: 09-119

UF IRB ID: 2008-U-1071

Approval Date: 19 February 2009

Date for Continuing Review: 18 February 2010

The Chair of the Institutional Review Board of Iowa State University has reviewed and approved this project. You have permission to conduct this research according to the IRB approved protocol.

Your study has been approved according to the dates shown above. To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Obtain IRB approval prior to implementing any changes** to the study by contacting our office at IRB@iastate.edu.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.

Research investigators are expected to comply with the principles of the Belmont Report, and state and federal regulations regarding the involvement of humans in research. These documents are located on the Office of Research Assurances website [www.compliance.iastate.edu] or available by calling (515) 294-4566.

Application for Exemption from Institutional Oversight

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.



Institutional Review Board
Dr. Robert Mathews, Chair
203 B-1 David Boyd Hall
Baton Rouge, LA 70803
P: 225.578.8692
F: 225.578.8792
irb@lsu.edu | lsu.edu/irb

- Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-E, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at [http://appl003.lsu.edu/osp/osp.nsf/\\$Content/Humans+Subject+Committee?OpenDocument](http://appl003.lsu.edu/osp/osp.nsf/$Content/Humans+Subject+Committee?OpenDocument)
- A Complete Application Includes All of the Following:
 - (A) Two copies of this completed form and two copies of parts B thru E.
 - (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1 & 2)
 - (C) Copies of all instruments to be used.
 - If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
 - (D) The consent form that you will use in the study (see part 3 for more information.)
 - (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB.
Training link: (<http://cme.cancer.gov/clinicaltrials/learning/humanparticipant-protections.asp>.)

1) Principal Investigator: Aila Montoya Rank: Doctoral Candidate
 Dept.: Special Education Ph: 786-897-8873 E-mail: ailamontoya@gmail.com

2) Co Investigator(s): please include department, rank and e-mail for each
 If student, please identify and name supervising professor in this space
Holly Lane, Ph.D, Associate Professor, University of Florida, Department of Special Education,
352-392-0701 Ext. 246, hlane@ufl.edu

3) Project Title: A Comparison of the Educational Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education

4) LSU Proposal?(yes or no) N If Yes, LSU Proposal Number _____
 Also, if YES, either This application completely matches the scope of work in the grant OR
 More IRB Applications will be filed later

5) Subject pool (e.g. Psychology Students) Students with learning disabilities
 -Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature Aila Montoya ** Date 3-2-09 (no per signatures)
 **I certify my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Effective August 1, 2007, all Exemptions will expire three years from date of approval, unless a continuation report, found on our website, is filed prior to expiration date

Study Exempted By:
 Dr. Robert C. Mathews, Chairman
 Institutional Review Board
 Louisiana State University
 203 B-1 David Boyd Hall
 Baton Rouge, LA 70803
 225-578-8692 | www.lsu.edu/irb
 Exemption Expires: 3-1-2012

Screening Committee Action: Exempted <input checked="" type="checkbox"/> Not Exempted <input type="checkbox"/>	Category/Paragraph _____
Reviewer: <u>Mathews</u>	Signature: <u>Robert Mathews</u> Date: <u>3-2-09</u>



THE UNIVERSITY OF MICHIGAN

BEHAVIORAL SCIENCES INSTITUTIONAL REVIEW BOARD
HEALTH SCIENCES INSTITUTIONAL REVIEW BOARD
540 EAST LIBERTY STREET, SUITE 202
ANN ARBOR, MICHIGAN 48104-2210
PHONE: 734 936-0933 FAX: 734 998-9171
E-MAIL: irbhsbs@umich.edu WEBSITE: www.irb.research.umich.edu

Ms. Ailé Montoya
Doctoral Student
Department of Special Education
P.O. Box 117050/G315 Norman Hall
Gainesville, FL 32611

February 26, 2009

Dear Ms. Montoya,

Thank you for contacting the University of Michigan (UM) IRB Office to determine if IRB approval is necessary from our institution for the conduct of your research project "*A Comparison of the Educational Supports Needed and Provisions Provided for Undergraduate and Graduate Students with Learning Disabilities in Higher Education*". According to the Office for Human Research Protections (OHRP) "Guidance on Engagement of Institutions in Human Subjects Research" (Section B, 4) the University of Michigan is not engaged in this research project and you are not required to obtain IRB approval from our office for this research project.

The UM IRB Office has received a copy of the IRB approval letter from the University of Florida and thus, you may proceed with your research project on our campus.

If you have any further questions, please feel free to contact me at 734-936-0933.

Sincerely,

Mona Bruch Moore, RAC
Assistant Administrative Director
IRB Health/IRB Behavioral Sciences

TEXAS A&M UNIVERSITY
DIVISION OF RESEARCH AND GRADUATE STUDIES - OFFICE OF RESEARCH COMPLIANCE

1186 TAMU, General Services Complex
College Station, TX 77843-1186
750 Agronomy Road, #3500

979.458.1467
FAX 979.862.3176
<http://researchcompliance.tamu.edu>

Human Subjects Protection Program

Institutional Review Board

DATE: 02-Mar-2009

MEMORANDUM

TO: MONTOYA, ALIE
77843-3578

FROM: Office of Research Compliance
Institutional Review Board

SUBJECT: Request for Waiver from IRB Review

**Protocol
Number:** 2009-0128

Title: A Comparison of the Education Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education

**Review
Category:** Waived from IRB Review

Provisions: University of Florida study, may use TAMU students once given permission by TAMU Disability Services.

This electronic document provides notification of the review results by the Institutional Review Board.

CONFIRMATION OF EXEMPT RESEARCH REGISTRATION

June 12, 2009

FRANCIS M. CRINELLA
PEDIATRICS

RE: HS# 2009-6948 *"A Comparison of the Educational Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education"*

The human subjects research project referenced above has been registered with the UC Irvine Institutional Review Board (UCI IRB) as Exempt from Federal regulations in accordance with 45 CFR 46.101. This exemption is limited to the described activities in the registered UCI IRB Protocol Narrative and extends to the performance of such activities at the sites identified in your UCI IRB Protocol Application. Informed consent from subjects must be obtained as indicated below. UCI IRB conditions for the conduct of this research are included on the attached sheet. If this project is part of a proposal being submitted for funding, a copy of this letter should be included with the funding proposal to verify the exempt status of the research.

Information provided to prospective subjects to obtain their informed consent should, at a minimum, consists of the following information: the subject is being asked to participate in research, what his/her participation will involve, all foreseeable risks and benefits, the extent to which privacy and confidentiality will be protected, that participation in research is voluntary and the subject may refuse to participate or withdraw at any time without prejudice.

Questions concerning registration of this study may be directed to the UC Irvine Office of Research Administration, 4199 Campus Drive, Suite 300, Irvine, CA 92697-7600; 949-824-6068 or 2125 (biomedical studies) or 949-824-6662 (social-behavioral studies).

Level of Review:
Exempt Review, Category 2

Informed Consent Requirements:
1. Signed Informed Consent not required
2. Study Information Sheet required



Ruth A. Mulnard, RN, DNSc, FAAN
Chair, Institutional Review Board

Registration valid from 06/12/2009 to 06/11/2012

UCI (FWA) 00004071, Approved: January 31, 2003

cc: Department Chair

DATE: February 19, 2009

TO: Alié Montoya
PO Box 117050
Campus

FROM: Ira S. Fischler, PhD, Chair *ISF*
University of Florida
Institutional Review Board 02

SUBJECT: Approval of Protocol #2008-U-1071

TITLE: A Comparison of the Educational Supports Needed and Provisions Provided for Undergraduate and Graduate Students with Learning Disabilities in Higher Education

SPONSOR: None

I am pleased to advise you that the University of Florida Institutional Review Board has recommended approval of this protocol. Based on its review, the UFIRB determined that this research presents no more than minimal risk to participants, and based on 45 CFR 46.117(c), An IRB may waive the requirement for the investigator to obtain a signed consent form for some or all subjects if it finds either: (1) *That the only record linking the subject and the research would be the consent document and the principal risk would be potential harm resulting from a breach of confidentiality. Each subject will be asked whether the subject wants documentation linking the subject with the research, and the subject's wishes will govern;* or (2) *That the research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside of the research context.*

The IRB authorizes you to administer the informed consent process as specified in the protocol. If you wish to make any changes to this protocol, ***including the need to increase the number of participants authorized***, you must disclose your plans before you implement them so that the Board can assess their impact on your protocol. In addition, you must report to the Board any unexpected complications that affect your participants.

If you have not completed this protocol by **February 18, 2010**, please telephone our office (392-0433), and we will discuss the renewal process with you. It is important that you keep your Department Chair informed about the status of this research protocol.

ISF:dl



Human Subjects Office

340 Medicine Administration Building
Iowa City, Iowa 52242-1101
319-335-6564 Fax 319-335-7310
irb@uiowa.edu
<http://research.uiowa.edu/hso>

November 30, 2009

TO: Whom it may concern

FROM: Bill Hubbard, M.A, CIP
IRB-01 Chair Designate
Assistant Director Human Subjects Office

RE: IRB Project Review

Regarding Ms. Montoya's research project, the IRB has determined that it does not need IRB review or approval at the University of Iowa as no one here is engaged in research. She has requested that the director of Student Disability Services distribute a letter announcing the study and detailing the URL of the web-based survey. He will also send out a reminder letter a few weeks later. At no time will Ms. Montoya have access to e-mail addresses or the identities of the students at the University of Iowa.

Please don't hesitate to contact me if you have any questions.

**University of Missouri
Institutional Review Board**

Dear Investigator:

Your human subject research project entitled A Comparison of the Educational Supports Needed and Provisions Provided For Undergraduate and Graduate Students with Learning Disabilities in Higher Education was reviewed and APPROVED as "Exempt" on March 10, 2009 and will expire on March 10, 2010. Research activities approved at this level are eligible for exemption from some federal IRB requirements. Although you will not be required to submit the annual Continuing Review Report, your approval will be contingent upon your agreement to annually submit the "Annual Exempt Research Certification" form to maintain current IRB approval. You must submit the "Annual Exempt Research Certification" form by January 24, 2010 to provide enough time for review and avoid delays in the IRB process. Failure to timely submit the certification form by the deadline will result in automatic expiration of IRB approval. (See form: <http://irb.missouri.edu/eirb/>)

If you wish to revise your activities, you do not need to submit an Amendment Application. You must contact the Campus IRB office for a determination of whether the proposed changes will continue to qualify for exempt status. You will be expected to provide a brief written description of the proposed revisions and how it will impact the risks to subject participants. The Campus IRB will provide a written determination of whether the proposed revisions change from exemption to expedite or full board review status. If the activities no longer qualify for exemption, as a result of the proposed revisions, an expedited or full board IRB application must be submitted to the Campus IRB. The investigator may not proceed with the proposed revisions until IRB approval is granted.

Please be aware that all human subject research activities must receive prior approval by the IRB prior to initiation, regardless of the review level status. If you have any questions regarding the IRB process, do not hesitate to contact the Campus IRB office at (573) 882-9585.

Campus Institutional Review Board



UNIVERSITY OF OREGON

March 11, 2009

TO: Aile Montoya, Principal Investigator
Special Education, University of Florida

FROM: *K. B. Hee*
Kira B. Homo, IRB Program Analyst
Committee for the Protection of Human Subjects
Social/Behavioral Panel – FWA 00005914

RE: Protocol #E519-09, entitled “A Comparison of the Educational Supports Needed and Provisions Provided for Undergraduate and Graduate Students with Learning Disabilities in Higher Education”

Your protocol has been REVIEWED and APPROVED by the Committee for the Protection of Human Subjects (CPHS). The materials enclosed with this notice are the official records and must be retained. Only the approved materials may be used for this research.

Please note that approval by OPHS does not guarantee cooperation from Disability Services. Although OPHS and the IRB have reviewed your study for ethical concerns and determined it meets all current federal, state, and university regulations, only Disability Services may determine how they wish to use their own listservs/ mailing lists.

The approval of the CPHS is based upon your representations of the nature of the project and the involvement of human subjects. It is the responsibility of the principal investigator to **report adverse events or unanticipated problems involving risks to subjects to the Office for Protection of Human Subjects (OPHS) within 24 hours**. If during the course of your project you change your methodology in any way you are required to submit a MODIFICATION FORM to the CPHS for approval prior to implementation.

This approval is for one year, unless otherwise noted. Under the regulations, the CPHS will review projects at least annually, or more often if it deems that the risks to subjects warrant a more frequent review.

When the project has been closed (i.e., procedures involving human subjects are completed), the investigator should complete the FINAL REPORT portion of the CONTINUING REVIEW FORM and send it to the OPHS. All records, including signed consent forms, must be retained by the investigator for a minimum of 3 years after the OPHS FINAL REPORT FORM is submitted to the OPHS or the final expenditure report is submitted to the funding agency, unless otherwise specified by the funding agency.

If you have any questions, please contact the OPHS at (541) 346-2510. You may also consult the OPHS website (<http://humansubjects.uoregon.edu/>).

cc: Holly Lane, Special Education, University of Florida, Faculty Advisor

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS • OFFICE FOR PROTECTION OF HUMAN SUBJECTS
1600 Millrace Drive, Suite 105, 5237 University of Oregon, Eugene OR 97403-5237
T (541) 346-2510 F (541) 346-6224 <http://humansubjects.uoregon.edu>

An equal-opportunity, affirmative-action institution committed to cultural diversity and compliance with the Americans with Disabilities Act

APPENDIX G
DISABILITY SERVICES PRE-NOTICE LETTER

Office of Disability Services
Pre-Notice Letter of Research Study

Dear Directors of Disability Services,

The IRB office at each of the nine participating educational institutions has approved the following research study: A Comparison of the Educational Supports Needed and Provided for Undergraduate and Graduate Students with Learning Disabilities in Higher Education. Attached is a memo describing the steps to be followed in the dissemination of the online questionnaire to all students with learning disabilities registered with the office of disability services at your institution.

I would like some feedback from you at this time to determine if next week would be an appropriate time to begin to mail the online questionnaire to your students. A series of emails need to be mailed out to students over a period of two weeks, but there will be breaks in between the email messages to avoid overwhelming students. The letters are electronic consent forms as follows: (a) pre-notice letter, (b) cover letter, (c) first reminder letter, and (d) second reminder letter. The text of each letter needs to be highlighted, cut and pasted into an email message in order for the online questionnaire link to work properly (for students to have access).

I would like for you to email me each time you email students the letters. This will allow me to keep track of each educational institution accordingly.

I look forward to working with you. I would like to take the time and thank each of you from the bottom of my heart for volunteering to help me with this research study. This project would not be possible without your support. I am deeply appreciative.

If you have any questions, please do not hesitate to email me at ailemontoya@gmail.com or call me at 786-897-8873.

Best Regards,

Ailé Montoya
Doctoral Candidate
University of Florida
P.O. BOX 117050/ 1403 Norman Hall
Gainesville, Florida 32611-7050

REFERENCES

- American with Disabilities Act of 1990, Pub. L. No, 101-336, 1991. Available:
<http://www.jan.wvu.edu/media/adahandbook/handbook.html>
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BIOGRAPHICAL SKETCH

Ailé Montoya was born in Santiago de Cuba, Cuba in 1976. She came to the United States with her father, mother, and brother during the Mariel in 1980 at four years of age. She was raised in Miami, Florida where she graduated one year early from Southwest Miami Senior High School in 1993. She earned an Associate in Arts degree in Liberal Arts from Miami-Dade Community College in 1995. Ailé also earned the Cooperative Education Certificate in Medicine while interning at Miami Children's Hospital. She was a recipient of the Certificate of Scholarship Merit as a member of Phi-Theta Kappa, the International Honor Society of two-year College, in 1994 and the Outstanding Academic Achievement Award in 1995.

Ailé earned a Bachelor of Arts degree with a dual major in psychology and elementary education from the College of Arts and Sciences from the University of Miami in 1998. As an incoming transfer student, she was awarded the University of Miami Academic Merit Grant that helped fund her academic program of study. Ailé was a member of the Transfer Advisory Buddy System (TABS) Honor Society from 1996-1998 where she served as advisor and mentor to incoming transfer students. As a member of TABS, she was awarded the Leadership and Academic Achievement Award. She also earned Dean's List and Provost's Honor Roll awards from 1997-1998. She was a recipient of the Certificate of Scholarship Merit as a member of Psi-Chi, the National Honor Society in Psychology, in 1998. During her undergraduate studies at Miami-Dade Community College and the University of Miami, Ailé was recognized in the publication of and awarded The National Dean's List: Honoring Americas Outstanding College Students from 1994-1998.

Ailé earned a Master of Science in education degree, specializing in reading and learning disabilities, from the University of Miami in 2001. She was a recipient of the Reading and Learning Disabilities Grant that funded her academic program of study. Additionally, she earned a

Certificate in Communication Development Skills in Special Education. She became involved with the organization of Recording for the Blind and Dyslexic in 2000. She received the distinction of Academic Merit Award for completing the degree with a superior grade point average of 4.0. During her graduate studies at the University of Miami, she was recognized in the publication of and awarded the Chancellor's List: Honoring Americas Outstanding Graduate Students.

While in attendance at the University of Miami, Ailé served as a research assistant on several federally funded grants in the field of reading, special education, and developmental psychology. In the Department of Psychology, she engaged in the Head Start Transition Project where she administered, scored, and interpreted a genre of psycho-educational assessment tools that measure cognitive ability, academic achievement, oral language development, and reading readiness skills. As a participant in this project, Ailé became acquainted with the effects of early intervention programs such as Head Start on children's early school success. Additionally, she became knowledgeable concerning low-income and multiethnic children's development of emergent literacy, cognitive processes, and social competence during the early years of transition from preschool into elementary school.

Similarly, in the School of Education, Ailé served on research projects focusing on reading strategies that included Collaborative Strategic Reading, SEARCH, and ANNENBERG. Her valuable contribution to the Collaborative Strategic Reading (CSR) Project was recognized in the published article, Klingner, J. K., & Vaughn, S. (2000). The helping behaviors of fifth graders while using collaborative strategic reading (CSR) during ESL content classes. *TESOL Quarterly*, 34, 69-98. Through these research experiences she gained knowledge of effective literacy instruction for culturally and linguistically diverse students with disabilities.

Ailé was a special education teacher and reading leader at Howard D. McMillan Middle School in Miami, Florida from 2001-2005. She worked in an array of educational settings including varying exceptionality, inclusion, resource, and regular education. In these multiple settings she worked with students of different abilities as well as diverse cultural, linguistic, and economic backgrounds. As a reading specialist, Ailé taught the subject areas of Language Arts and Reading and conducted parent workshops in addressing best reading and writing practices for home learning instruction.

She was selected as a member of the Literacy State Adoption Committee pertaining to the adoption of middle school literacy textbooks for Miami-Dade County Public Schools, serving as a consultant and assessor of literacy instruction advocating on behalf of students with disabilities in 2002. Ailé was awarded the Exceptional Student Education Rookie Teacher of the Year Award for Miami-Dade County Public Schools through the Council of Exceptional Children in 2002. As an award recipient, she served as a mentor to beginning special education teachers.

Additionally, a journal entry regarding her experience as a beginning teacher was published in the book, Haager, D., & Klingner, J.K. (2005). *Differentiating instruction in inclusive classrooms: The special educators' guide*. Boston, MA: Allyn & Bacon. She currently holds a professional teaching certificate in the State of Florida in the following areas: (a) elementary education K-6, (b) learning disabilities K-12, (c) reading K-12, and the (d) endorsement of English for speakers of other languages K-12.

During her doctoral studies at the University of Florida, Ailé was a recipient of a Leadership Grant that funded her program of study. She served as a graduate research and teaching assistant on the Project Research in Teacher Education (RITE) for the Center on Personnel Studies in Special Education (COPSSE). Her contribution to Project Rite became a published article,

Kiely, M. T., Leko, M. M., Montoya, A., & Kamman, M. (2007). *Preparing special educators in reading instruction: The impact of state policies*. Journal of the International Association of Special Education, June, 2007. Retrieved November 2, 2007 from <http://iase.coe.nau.edu/IASE/>.

She also served as a graduate teaching assistant in the Department of Teaching and Learning working with the Professional Development Communities as a mentor teacher supervising pre-service teacher interns.

Additionally, Ailé worked as a graduate assistant at the International Academy for Research in Learning Disabilities and the Critical Friends Institute in Designing Professional Learning Communities in Teacher Education. She played a role as an advisory board committee member in Project Inspire, Integrating Scientifically Based Practice in Reading Education for the US Department of Education, Office for Special Education Programs in Personnel Preparation. Ailé was an active member in the Special Education Association for Doctoral Students (SEADS), serving as treasurer.

Her service in the doctoral program has included being a guest reviewer for conference presentations for the Council for Exceptional Children and the Teacher Education Division. She is a member of the Council for Exceptional Children, the Division of Research in Teacher Education, and the Division of Learning Disabilities. Ailé has presented at several conferences in the following areas: (a) reading, (b) teacher education, (c) learning disabilities, and (d) postsecondary educational supports and accommodation for students with disabilities. She was recognized for her outstanding academic achievement, thus selected by the graduate school for the Delta Epsilon Iota Academic Honor Society award in 2008.

In the future, Ailé plans to continue research in postsecondary education and work with faculty, students, and disability service personnel to improve accommodation and educational

support services. Her other interests include to continue educational research to advance classroom practice and as a teacher educator disseminate research-based practices to pre-service and in-service teachers. She wants to take part in being an advocate, consultant, and public speaker as they relate to educational policy and practice, reading, teacher education, learning disabilities, and postsecondary educational supports and accommodation for students with disabilities.