ABSTRACT

CARDENAS, DAVID ALEJANDRO. Measurement of Involvement Factors in Leisure Studies Doctoral Programs (Under the direction of Dr. Beth Wilson, and Dr. Siu-Min Ting)

Scholars have stated that involvement is critical in the success of doctoral students, yet limited information and research has been conducted on involvement and its relationship to doctoral students. The purpose of this study was to obtain a better understanding of leisure studies doctoral student involvement patterns. The Doctoral Student Involvement Questionnaire (DSIQ) was developed as an assessment and evaluation instrument to measure leisure studies doctoral student involvement. The DSIQ was administered to 232 students in 18 doctoral granting institutions with a response rate or 53.7%.

Exploratory factor analysis using principle component analysis with Varimax rotation was performed on the 42 item scale to determine the latent structure of leisure studies doctoral student involvement. A four factor solution accounting for 49.9% of the total cumulative variance was retained. The four factors were labeled (1) peer and social, (2) faculty, (3) academic and professional, and (4) research. The results of this study indicate the involvement patterns of leisure studies doctoral students are similar to undergraduate students, yet also have some major differences. Similarities include the multi-dimensional structure of involvement, and the social, faculty, and research activity patterns. Differences include the dependence on the disciplines profession and the local academic department which guides many of the experiences and activities of doctoral students.

MEASUREMENT OF INVOLVEMENT FACTORS IN LEISURE STUDIES DOCTORAL PROGRAMS

By

DAVID ALEJANDRO CARDENAS

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APPROVED BY:

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Co-Chair of Advisory Committee Co-Chair of Advisory Committee

DEDICATION

This dissertation is dedicated to my wife and two daughters.

BIOGRAPHY

David Alejandro Cárdenas was born on June 26th, 1973 in Quito Ecuador. He moved from Quito to North Carolina in 1986. In 1995 he received his Bachelors of Science in Zoology and in 2001 his Master of Science both from North Carolina State University. While at North Carolina State University he worked in the Division of Student Affairs, with University Dining, and in the Department of Parks, Recreation and Tourism Management.

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CHAPTER 1

INTRODUCTION

The doctoral education is the pinnacle of the educational process. When individuals complete this aspect of their academic career they are expected to have mastered their area of focus and are considered experts in their field of study. These experts are viewed as future leaders and visionaries of their field and profession. Some will leave academia and become expert scholars in government, health care, business, business and industry (Haworth & Bair, 2000). However, a large majority will enter the workforce as academicians/junior faculty. As faculty members, they are expected to conduct, fund and administer research, teach, mentor and advise students, participate in departmental and institutional committees, and much more. These new academicians will have the responsibility of developing new minds, uncovering and discovering new knowledge and enhancing society's way of life and thinking.

Scholars have conducted few studies on doctoral students and doctoral education, even though there is an enormous amount of responsibility and importance placed on this group of future leaders (Haworth & Bair, 2000). Specifically, little empirical research has been conducted on doctoral student learning and development (Faghihi & Ethington, 1996; Kuh, 1992; Malaney, 1988). Even less research has been conducted on doctoral studies outside of the traditional arts and sciences, such as in the social sciences (Haworth & Bair, 2000) and leisure sciences.

Recently the topic of doctoral education has become important in higher education. The amount of physical, financial, and emotional investment by all parties involved (students, faculty, departments, institutions and communities) in the process of doctoral education is tremendous (Malone, Nelson, & Nelson, 2001). This investment includes the students' recruitment, mentoring, teaching, guidance, research development, and professional preparation. This reason alone justifies the need for formal research; however there are other compelling arguments to understand the doctoral student process and the students' development. It is anticipated that a large number of senior faculty members will be retiring in the near future (Austin, 2002). For example, in leisure studies over 32% of the faculty members are 50 and older and 2% are 30 and younger (Schlatter, 2002). There have been concerns that more senior faculty members will be leaving the field of leisure studies in higher education than new junior faculty members entering the field. This projection of retirements has prompted the need for a larger number of highly qualified, well-prepared junior faculty members in the leisure studies discipline in academia.

In addition, not only will there be a need to fill positions, but the profession itself has been criticized. Some claim that doctoral students are not being properly prepared for challenges they will encounter as academicians and label the doctoral degree as one-dimensional (Austin, 2002). Historically, in preparing doctoral students, the focus has strictly been on developing and strengthening students' research skills, while often neglecting the opportunity to enhance other essential skills such as teaching, advising, grant writing, and mentoring (Nyquist, 2002).

Kanters (1992) stated that most doctoral students in leisure studies are not prepared to teach or conduct other critical functions (e.g. advising, mentoring) when they enter academia. The need for better preparation is important not only to the doctoral students, but also to the students and community they will eventually serve.

In conjunction with doctoral students' not being adequately prepared, there are also some alarming statistics with respect to their retention rates. It has been documented that the attrition rates in doctoral studies are as high as 40% to 60% (Berelson, 1960; Bowen & Rudenstine, 1992) depending on the field and program of study (Bair, 1999). This factor combined with the physical, financial, emotional investment, and the need to better prepare doctoral students, suggests that it is critical for the success of higher education to conduct formal research on doctoral students' development and education.

Doctoral education is a socialization process similar to the one for undergraduate students of learning the skills, knowledge, attitudes and values, and norms of the profession (Baird, 1990; Faghihi & Ethington, 1996; Golde, 2000; Tinto, 1993). However, socialization in doctoral education is more specialized (Baird, 1990), with the students becoming integrated into the institution and acculturated to the department, the institution and the profession. Yet doctoral students are often a population that is often forgotten when it comes to their student and professional development and there is little research on the socialization and integration of these students (Haworth & Bair, 2000). It has often been assumed that when doctoral students enter this stage in their academic career they have overcome many of the challenges and obstacles posed by higher education. The reason for this

assumption is that the majority of doctoral students are highly qualified, carefully selected individuals (Kerlin, 1995). Yet the doctoral education process has been widely criticized and is facing a problem of attrition and retention of students.

The socialization process involves becoming acculturated to a profession. To become acculturated a doctoral student must become involved in all aspects of graduate education. As mentioned above, all too often the focus of doctoral students is solely research, yet that encompasses only one small aspect of the training needed to succeed and prosper as academicians. Learning methods, formulas, and strategies are important, but often these concepts are difficult to master without applying the knowledge and synthesizing the experiences outside traditional methods such as classroom instruction. There are many factors that impact the socialization process of a graduate student such as finances, program of study, satisfaction, academic background, and motivation. One factor that has been addressed and researched extensively in undergraduate education is student involvement (Astin, 1984, 1993, 1999; Cooper, Healy, & Simpson, 1994; Kuh, Schuh, Whitt, & Associates, 1991; Milem & Berger, 1997; Tinto, 1993). Student involvement is a tool that can expose, integrate and teach students through both traditional and non-traditional methods (Astin, 1984).

The theory of student involvement was formally introduced by Alexander Astin as a model to help in "designing more effective learning environment" (Astin, 1984 p. 307) to develop and prepare undergraduate students in their academic, professional and personal life endeavors. Involvement is defined by Astin (1999) as "the amount of physical and psychological energy that the student devotes to the academic

experience" (518). A highly involved student is one that spends a significant amount of time and energy being engaged in their studies, peers, faculty, and campus activities, while a disengaged student is one who spends little time and energy on their studies, campus activities, and may not interact with their peers and faculty members (Astin, 1984, 1999).

Involvement is a socialization process of understanding and learning about the challenges, demands, needs, benefits and rewards of the student's environment. It is a process of allowing a student to meet, explore, and interact with his or her community and institution. Through involvement, students have the opportunity to build and develop networks which could lead to future employment, grants, and other benefits such as camaraderie. By getting students involved they have the opportunity to learn the culture and customs of the profession while becoming an active participant in the process and not just a passive observer (Kuh, et. al 1991; Kuh, 1992).

Currently, the majority of models of student development, both undergraduate and graduate students, have included involvement (Girves & Wemmerus, 1988; Tinto, 1993). Studies support the notion of the significance of involvement and undergraduate student development and retention (Kuh, 1992; Kuh, Pace, & Vesper 1997). Scholars have also stated that involvement is also critical in the success of doctoral students (Bair, 1999; Girves & Wemmerus, 1988; Tinto, 1993), yet limited information and research has been conducted on involvement and its relationship to doctoral students. Therefore, it is important to understand the relationships between

involvement and doctoral students and to have appropriate instruments to measure involvement.

Purpose of the Study

The main goal of this research was to expand the knowledge of student involvement to doctoral student education and the discipline of leisure studies. In addition this study was intended to provide a tool that may help better understand the experience and activities of doctoral students. The objective of this study can be divided into five areas: (1) develop a profile of demographic background and characteristics of the leisure studies doctoral students, (2) develop an instrument and scale to measure involvement for this population, (3) determine the validity and reliability of the instrument and scale, (4) determine the latent structure of doctoral student involvement, and (5) measure doctoral student involvement. The survey, Doctoral Student Involvement Questionnaire (DSIQ), was developed based on related literature on involvement and doctoral students and past surveys on involvement.

Recent research supports the idea that there is a positive relationship between student learning and development and the amount of energy a student invests into his or her institution. Currently there are assessment tools measuring undergraduate students' level of involvement, such as the College Student Experience Questionnaire (CSEQ), and the National Survey of Student Engagement (NSSE). Also there have been surveys and assessment tools developed to measure involvement in specific groups of students such as for high school students (High

School Survey of Student Engagement - HSSSE) and law students (Law School Survey of Student Engagement - LSSSE). These surveys have been tested and found to be valid and reliable assessment tools of student involvement. Based on the results from these assessment tools, policies and procedures have either been developed or modified to enhance student retention as well as help in their overall development. The assessment instruments have provided administrators with insight into student experience or lack of experience in school. The results from the surveys have been a catalyst for creating or revising policies and procedures to better prepare students during their academic career (Kuh, Hayek, Carini, Ouimet, Gonyea, & Kennedy, 2001).

However, there is no specific tool to measure the level of involvement of doctoral students, and specifically no survey has been developed to measure leisure studies doctoral students' level of involvement. The purpose of the current study was to expand the knowledge of involvement and doctoral student and to develop an assessment instrument that will accurately measure leisure studies doctoral students' involvement.

Research Questions

Currently, limited information is known about doctoral student development and much less about doctoral student involvement. The aim of the study was two-fold. First, develop an assessment instrument; the Doctoral Student Involvement Questionnaire (DSIQ), and the doctoral involvement scale. Second, determine the

latent structure of doctoral student involvement. Based on the objectives of this study six research questions were developed.

1. What is the overall validity and reliability of the DSIQ for leisure studies doctoral students?
2. What is the validity and reliability of the doctoral student involvement scale in the DSIQ?
3. What is the latent structure of doctoral student involvement?
4. What are the levels of involvement measured by the different factors (academic, social, faculty, peer, professional, institutional, research, and teaching) of leisure studies doctoral students?
5. What is the overall level of involvement in leisure studies doctoral students?
6. What is the profile of demographic characteristics of the leisure studies doctoral students?

Definitions of the Terms

ABD: "All but dissertation" includes all doctoral students who have completed all of the required course work and passed the preliminary exam for the doctoral degree except for the writing of the defense of the dissertation.

Attrition: Discontinuing progress toward the doctoral program.

Completion: The successful fulfillment of all doctoral degree requirements.

Doctoral Student: A person who is either full-time or part-time in the pursuit of the highest academic level of study in a college or university.

Involvement: The amount of physical and psychological energy that the student devotes to the academic and educational experiences.

Socialization: The process of learning interpersonal and cultural norms and adapting to meet the needs and values of the current institution.

Student Development: The holistic growth and progress of a student during their academic studies.

Undergraduate Student: A person who is either full-time or part-time in the pursuit of a bachelor's degree in a college or university.

Retention: A student at a college or university that has maintained their pursuit of their degree.

Significance of the Study

The development of doctoral students is a complex issue. There are many factors and variables that are significant in the success of all doctoral students. It is important to investigate these variables both together as a group, as well as individually. The purpose of this study was to investigate one of these variables, involvement. Specifically this study was designed to measure the level of involvement of leisure studies doctoral students.

The contribution of the study can be divided into three interrelated areas: retention and attrition, overall preparedness, and student development modeling. The first, and the area the majority of research in doctoral student research has focused on, is retention. As mentioned above, a large number of doctoral students, across all disciplines drop out and never complete their degree. As with

undergraduate students it has been stated that the more involved a student is with their institution and academics the more likely they will complete their studies. Determining the level of involvement can be an indicator for the need to develop polices and procedures to get students involved. These policies and procedures can assist in getting students more involved as well as increasing the retention rate.

In addition, determining the level of involvement can provide insights to the doctoral students' preparedness. The additional exposure doctoral students attain while completing their doctoral degree to all aspects of academia and practice, the better prepared they will be at the next level (Nyquist, 2002). If doctoral students are not given opportunities to teach, conduct research, write grants or mentor students, how can they be expected to perform these tasks as junior faculty members? This research will be the first step in determining if the more involved doctoral students are during their academic career, the better prepared they are as faculty members. Also, this research will provide valuable information in constructing a model of doctoral student development. This research on involvement addressed one of these variables while contributing to the body of knowledge in doctoral student development.

CHAPTER 2

REVIEW OF LITERATURE

Involvement is a construct that has been researched extensively in the area of undergraduate student development. Alexander Astin (1984) first formally introduced the theory of involvement to facilitate the design of more effective learning environments. Since Astin's introduction, many scholars have adopted the theory of involvement to help better understand undergraduate students' experiences. Policies and procedures have been designed based on levels of student involvement in order to better integrate undergraduate students into the institution, increase undergraduate retention, and better prepare undergraduate students for future challenges. However, little research has focused on involvement and its relationship with graduate/doctoral education. The focus of the review of literature will consist of: (1) review of Astin's theory of student involvement; (2) review of Tinto's theory of student departure, and theory of doctoral persistence; (3) review of Milem and Berger's integrated model of persistence based on Astin's theory of student involvement, and Tinto's theory of student departure; (4) review of existing instruments measuring involvement; (5) review of research on graduate student involvement; (6) review of general research on doctoral education; (7) review of research of leisure studies doctoral education; and (8) summary of literature review.

Astin's Theory of Student Involvement

Astin (1984, 1999) introduced the concept of "student involvement" because he hypothesized that as a result of being more involved, students are both socially and academically more successful, which leads to their being able to learn and develop more. The theory of student involvement is based on longitudinal studies of student persistence, the overall findings of which concluded that noninvolvement contributed to the premature departure of college students (Astin, 1975).

Astin (1984) defined student involvement as "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 297). He used this example to illustrate the difference between an involved and an uninvolved student:

> A highly involved student is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students. Conversely, a typical uninvolved student neglects studies, spends little time on campus, abstains from extracurricular activities, and has infrequent contact with faculty members of other students. These hypothetical examples are only intended to be illustrative; there are many other possible forms of involvement" (p. 297 – 298).

An involved student is an active participant with the social and academic environment of the institution.

Astin's (1984) theory of involvement stressed activity and action. He believed that understanding a student's behavior was more important and provided

more insight into their development than understanding the student's thoughts and feelings. He also argued that administrators and faculty members should not concentrate solely on course content and teaching techniques. More time and energy should be spent on understanding the students' individual needs (goals, experiences, learning habits), and understanding how to modify students' behavior and activities. The focus for administrators and faculty members should be on the development of policies and programs that take into account the amount of energy and time invested by the students, with respect to their interests, goals, and commitments.

Astin also stated that motivation is an important component of involvement, and that motivation partially explains involvement. However, he wrote that involvement goes beyond being motivated. To Astin, motivation translated into action results in involvement. To help capture the meaning of involvement, Astin provided many words and phrases. A few of these words and phrases include; engage in, commit oneself to, tackle, take on, undertake, participate in, devote oneself in, and plunge into (Astin, 1984). These words and phrases are all active verbs, which describe behaviors.

Astin (1984) outlined student involvement theory into five postulates: (1) involvement relates to the investment of physical and psychological energy in various objects depending on how general or specific the experience is; (2) involvement occurs along a continuum in which the amount of student energy ranges depending on "object" and "time"; (3) involvement has both qualitative and quantitative measures; (4) the amount of personal development and student learning

with any educational program is directly proportional to the quantity and quality of student involvement; and (5) the effectiveness of any educational practice or policy is directly associated to the potential of the practice or policy to increase student involvement (p. 298).

The first postulate indicates a personal investment of both a physical energy and mental energy. This would include the amount of time and energy one spends attending or participating in an activity such as student government or intramural recreation (Kuh, et al. 1991). This also includes the amount of time and energy one spends thinking and contemplating a statistical problem or developing a research question.

The second postulate indicates that involvement flows continually with no tangible beginning or end. It also implies that involvement is individualized and dependent on the student and their interests as well as dependent on the "object" and "time".

The third postulate states that involvement has both quantitative and qualitative components. Calculating involvement could include counting the number of times students use the library or counting how often a student meets with their advisor. Involvement also has many complex angles or dimensions such as the state-of-mind that results from being immersed in an activity. Another example could include developing a cognitive connection with a professor's thoughts, theories, or research (Kuh, et al. 1991).

The fourth postulate indicates that personal development and student learning is directly proportional to the quality and quantity of student's involvement.

The more effort spent in scholarly and interpersonal activities, the more the student benefits intellectually and socially. Time on task is important, but more important is the students' accomplishments (Pace, 1984). What students accomplish and the effort invested in those achievements and experiences enhance student development.

Astin's fifth and last postulate states that educational practices and policies are directly connected to involvement. A well-designed and effective educational practice and policy in itself encourages active involvement, both socially and academically, which benefits a student's development (Astin, 1984; Kuh, et al. 1991). Astin also stated that the fourth and fifth postulates are the most important because they "provide clues for designing more effective educational program for students" (p. 298). However, he also states that they are not true postulates because they are "subject to empirical proof" (p. 298).

Astin listed four main justifications for his development of the theory of involvement in student development; (1) no need for interconnected boxes/model to explain the theory; (2) past student development research can be explained by involvement; (3) classical learning theory and psychoanalysis can incorporate the concepts of involvement; (4) researchers, faculty members, and college administrators can use student involvement, not only to guide research in student development, but also to guide the designing of an effective learning environment (1984).

Astin (1984) argued that the theory of student involvement goes beyond other developmental theories because it provides a "mediating mechanism" (p. 299) that

helps translate educational practices and policies into student development. Most other developmental "theories focus primarily on developmental outcomes; the *what* of student development. Whereas the theory of student involvement is more concerned with the behavior mechanism or processes that facilitate student development; the *how* of student development" (Astin, p. 299, 1984). The theory of student involvement makes the student an active participant in the learning process. The student's actual effort, energy, and time on task, are the focal point of the theory. Astin also stated that faculty members and administrators should place less emphasis in course content, teaching techniques or resources, and more emphasis in developing policies and procedures that encourage student involvement. Astin admitted that techniques and resources are important, but he argued they should not be the focus in the development of the students. The main construct of student involvement is to develop or strengthen programs and policies which encourage students to take an active role in their development and education (Astin, 1984,1999).

The theory of student involvement does have limits. Time and energy, which are finite, are the limiting resources. Students have to balance how and when to commit their time and energy. Often educational developmental activities compete with other types of essential activities, such as responsibilities to family, friends, and jobs. Because students are often obligated to many activities, all decisions (e.g. location of library, class schedules, office hours, types of recreational facilities, orientation, frequency of events, financial aid policies, parking, design of eateries)

made by the institution (faculty members and administration) are critical (Astin, 1984).

As mentioned at the beginning of the section, Astin's theory of student involvement was rooted in a longitudinal study of undergraduate college persistence. The main constructs and items of Astin's theory of student involvement were primarily identified in three follow up studies from 1966 to 1972 (Astin, 1977). Over 200,000 undergraduate students' responses were included in the studies. Astin conducted factor analysis for each of the follow-up studies to determine inter-correlated patterns of involvement. He concluded that there was not one major factor but many relatively independent factors of involvement. Astin (1977) determined that student involvement was multidimensional and could be manifested in many different aspects of one's college experience. Each follow-up study analysis revealed patterns of involvement, which Astin classified into seven factors. Those factors included: place of residence, honor program, academic involvement, student-faculty interaction, athletic involvement, involvement in student government, and research involvement (Astin, 1984).

In addition to identifying the main factors of undergraduate involvement, he concluded that these factors affect a student's persistence in college. He claimed that undergraduate persistence was directly affected by what he labeled as positive and negative environmental factors. Positive factors contributed to involvement while negative factors reduced involvement. Astin (1984) explained this by presenting "factors that contributed to the student's remaining in college suggested

involvement, whereas those that contributed to the student's dropping out implied a lack of involvement" (p. 302).

An example of one of these environmental factors in undergraduate students is the student's place of residence. Astin (1984) found that living on campus was a positive factor with respect to retention. Undergraduate students that live on campus had more opportunities to participate and interact in all aspect of campus life. This type of participation and interaction assists in developing with the institution. Students that live on campus eat in the same establishments, live in the same dormitories and walk the same paths to class. Commuters don't spend the same amount of time on campus and don't have the same opportunities to build the attachment and bond with the institution. The lack of attachment with the institution makes it easier for students to drop out (Astin, 1984).

Another example of an environmental factor, which affects students' retention, was faculty-student interaction. Astin (1984) found that frequent interaction with faculty increased student satisfaction with the institution. Students that were encouraged to be involved with the faculty and interacted with them frequently were more likely to build bonds with the faculty and the institution. As with the previous example of place of residence, students with a stronger bonds and attachment with the institution were less likely to drop out.

Astin's work related to the correlation between student involvement and student development was extensive and included the presentation and publication of many related papers (1984, 1999). Because of its importance and significance to the field of student development, Astin's 1984 article, which formally introduced the

theory of student involvement, was republished in the 1999 Silver Anniversary of The Journal of Student Development. Since the introduction of his work, researchers and administrators have incorporated the theory of involvement to better understand student experiences. This has led to the development of many programs and policies, which have benefited students' education experiences and overall development.

Tinto's Theory of Student Departure and Theory of Doctoral Persistence

As with Alexander Astin, Vincent Tinto (1975, 1986, 1987, 1993) also has contributed much to the field of student development by his research and writing on student retention and persistence in higher education. Many have noted similarities between Astin's theory of student involvement and Tinto's theory of student departure (Milem & Berger, 1997; Pascarella & Terenzini, 1991). They support the idea that student involvement has a positive influence on educational outcomes and believe it is important to research student involvement as it affected persistence in higher education. Yet a difference between the two theories is the manner in how they perceive involvement. As mentioned above, Astin defined involvement in terms of students' behaviors, while Tinto not only equated involvement with student's behavior but also with students' perceptions (Milem & Berger, 1999).

Tinto's main research focus, unlike Astin, was not strictly regarding involvement. Tinto (1993) concentrated most of his research on determining inter-institutional factors which influence student departure. Based on his work he developed a theory of student departure and a model of student departure. His main

concern with the development of the student departure model was to “understand how events within the institution come to shape the process of departure from that institution” (p. 34). He was interested in determining the environmental conditions of the institution, which attributed to a student’s decision to drop out.

Tinto’s (1993) student departure model, known as the *Longitudinal Model of Departure from Institutions of Higher Education* (Appendix A), was rooted in Arnold Van Gennep’s (1960) anthropological study of rites of passage. In Van Gennep’s studies he identified three main stages (separation, transitions, and incorporation) in an individual’s transition from youth to full adult member of his or her group. Those three stages provide Tinto (1986, 1993) with the conceptual framework for his theory and model of student departure.

In Tinto’s (1986, 1993) first stage, separation, the student leaves their community and familiar norms, values and behaviors. In the second stage, transition, the student is in the process of going beyond their familiar norms and starts to adapt to their new environment. The last stage of Tinto’s model, incorporation, the student not only adapts to, but adopts the norms, values, and behaviors of their new environment. The incorporation stage also signifies that the student has become involved in both the social and academics systems of the institution.

Tinto (1993) provided three main assumptions for his model of student departure. The first was that the focus of the model is inter-institutional. By inter-institutional, Tinto meant that the model only takes into consideration those items or activities that take place within or immediately before entrance into the institution.

The second assumption was that the model focuses on students that dropout voluntarily, but not students dismissed by the institution. In addition the model does not apply to students who leave temporarily and then come back to school or the students who transfer to other institutions. The last assumption addressed the longitudinal involvement and interaction between the student and the institutions.

Tinto's model focuses on the multiple interactions between the student, faculty, staff and administration with the academic and social system of the institution (Tinto, 1993). This interaction between the social and academic system was a key postulate of Tinto's model of student departure (Butcher, 1997). An institution is composed of both academic and social systems and these systems have both formal and informal structures. Tinto stressed that students' involvement with the formal and informal structures (for example, interacting with faculty in class or laboratories, collaborating with students on research projects, meeting with students at campus eatery, and or volunteering in peer mentoring programs) are critical indicators of the quality of students' effort. Tinto (1993) stated that quality of student effort is positively associated with a student's persistence and learning. The more effort (involvement) imparted by the student the more likely the student will persist.

As with Astin, Tinto's research focuses primarily on undergraduate students. However, in the appendix of his 1993 book, "Leaving College", Tinto briefly addressed the need to conduct research on doctoral student persistence and illustrates a model of doctoral student persistence (Appendix B). He also claimed

that neither graduate nor undergraduate educational theory guided the limited amount of research that had been done on graduate persistence.

Tinto (1993) wrote that the type and level of involvement between doctoral students and the academic and social systems of the institution have a direct influence on doctoral student persistence. He believed that the foundation of doctoral student persistence was similar to undergraduate student persistence; however, he also believed that there are some differences.

One similarity between undergraduate and doctoral student persistence was the need for student-faculty interaction, both academically and socially. This interaction and involvement is critical to the doctoral student's not dropping out. Another similarity is the need for doctoral students to become acculturated and involved in the institutional community. It is important that doctoral students become part of their institutions and more importantly a part of their departments or programs (Tinto, 1993).

Tinto (1993) also argued that there are some substantial differences between doctoral and undergraduate persistence. One significant difference is that doctoral persistence is guided not only by the norms, structures and values of the department and the institution but also by the student's specific field of study. The doctoral student's discipline often influences the specialized knowledge and experiences he or she will need to succeed. Because of these specialized exceptions and influence outside of the department and institution, doctoral student persistence differs between the specific fields of study.

Another difference, Tinto pointed out, is that the doctoral education, compared to undergraduate education, requires a greater dependence on the local department. The local department dictates most of the doctoral students' educational objectives and activities. Because the department dictates most of the activities, the lines between academic and social activities are often blurred.

> Social membership within one's program becomes part and parcel of academic membership, and the social interaction with one's peers and faculty become closely linked not only to one's intellectual development, but also to the development of important skills required for doctoral completion (Tinto, 1993, p 232).

The dependence and link between the academic and social systems and the local department greatly influences doctoral student persistence.

Tinto (1993) also pointed out that financial assistance plays a more critical role in doctoral student persistence than in undergraduate student persistence. The lack of financial resources provided to doctoral students can directly affect the amount of time spent on their academics and research. Also, the lack of financial resources often extends the amount of time it takes the doctoral student to complete his or her degree. The extension of time for degree completion could negatively affect the doctoral student's willingness and persistence.

Tinto (1993) concluded his discussion of doctoral student persistence by outlining some research agendas. First, he believed a full longitudinal panel study should be conducted of graduate student experiences and was important to know what experiences are important at different stages of the doctoral process. Also,

research should be conducted on the specific discipline to determine the norms and values and determine how they impact doctoral student persistence. In addition, he believed it was important to determine how the specific fields of study influence the institution and/or department and vice versa. The last research agenda offered by Tinto was the need to study department and institution policy on doctoral education. He stated that research must be conducted to determine what policy should be revised, deleted and developed to better enhance doctoral student education and willingness to persist. Tinto believed that many of these research questions can be investigated by comparing successful and unsuccessful doctoral students' experiences, as well as comparing successful and unsuccessful doctoral programs.

Integration of Astin's and Tinto's Theories

Berger and Milem (1997, 1999) studied the relationships and differences between Astin's theory of involvement and Tinto's theory of student departure. They developed an integrated model based on Tinto's and Astin's theory and writings. The integrated model was developed to explore and explain the relationship between students' behaviors and perceptions, as well as to determine how those behaviors and perceptions influence a student's academic and social integration with respect to their overall development. Berger and Milem initially developed their integrated model in 1997 and then replicated the same study with a more parsimonious model in 1999. Path analysis was used to examine behavioral and perceptual variables in first year undergraduate students at a private, research university (1999).

The overall finding of both studies indicates that the integrated model supported the combination of Tinto's theory of student departure and Astin's theory of involvement to better understand the process of student persistence (Berger & Milem, 1999). Also, Berger and Milem concluded that college student persistence is better comprehended by understanding both students' perceptual and behavioral measures. These perceptual and behavioral measures directly and indirectly affect the process of social and academic integration, which in turn affects student willingness and persistence (1999).

The Milem and Berger (1997, 1999) studies specifically addressed the concept of involvement and its direct and indirect effects on integration and persistence. They found that student involvement with peers and faculty benefited the students. Milem and Berger illustrate this by stating that "early involvement in the fall semester positively predicts spring involvement and has significant indirect effects on social integration, academic integration, subsequent institutional commitment, and persistence"…. and "early peer involvement appears to strengthen perceptions of institutional and social support and ultimately persistence "(1999, p. 658). Their studies also concluded that noninvolvement impacts a first year student's integration and persistence. Milem and Berger state that "early noninvolvement has a number of negative effects"… "they (noninvolved students) are less likely to perceive the institution or their peers as supportive, less likely to become integrated, and as a result, less likely to persist" (1999, p. 658).

Milem and Berger (1999) stressed the need to continue the investigation on involvement in higher education. They argued that much of the previous research

in undergraduate student departure underestimates the capacity of both involvement and noninvolvement to influence student persistence. They also recommended that additional research be conducted to address relationships between involvement, non-involvement, and different types of involvement (1999).

Measuring Involvement

Robert Pace, as with Alexander Astin, is considered a pioneer in the research and conceptualization of student involvement. Pace (1984) believed that student involvement, high expectations, and assessment and feedback can improve the quality of a student's education. He indicated that the quality of student involvement, as well as the opportunities and activities provided by colleges and universities, influence students' educational development perceptions. He also wrote that measuring the student's quality of effort or involvement could produce critical data and information, which then could be used to assess and evaluate the quality of students' educational experiences.

To collect this data and information on student involvement, Pace developed the College Student Experience Questionnaire (CSEQ) (1990). The CSEQ measures the quality of a student's involvement both academically and socially. The basic premise of the CSEQ is "the more effort students expend in using the resources and opportunities an institution provides for their learning and development, the more they benefit" (Gonyea, Kish, Kuh, Muthiah, & Thomas, 2003). Pace first administered the CSEQ in 1979 as a multi-institutional survey to measure undergraduate students' experiences. Since its initial inception, the CSEQ

has been revised three times (second edition – 1983, third edition – 1990, and fourth edition – 1998). In 1994, George Kuh officially took over the leadership of the CSEQ and moved the research program from UCLA to Indiana University.

The CSEQ has been widely used in undergraduate education to measure student experience at both four-year and two year institutions. Since its inception it has been administered to over 300,000 students in more than 400 institutions of higher learning. The current CSEQ totals eight pages and is composed of 150 items and divided into seven major sections: (1) background information, (2) college activities, (3) conversations, (4) reading/writing, (5), opinions about your college or university, (6) the college environment, and (7) estimate gains (Gonyea, et al. 2003).

The background section includes previous educational experiences and socio-demographic questions. The college activity section is composed of 13 activity scales to measure quality of effort and involvement. Those scales are titled: (a) library, (b) computer and information technology, (c) writing experiences, (d), experiences with faculty, (e) art music, and theater, (f) campus facilities, (g) clubs and organization, (f) personal experiences, (g) student acquaintance, (h) scientific and quantitative experiences, (i) topics of conversation, and (j) information in conversation. The college activity scales are measured by Likert type questions: very often, often, occasionally, and never. The college activity section constitutes the majority of the CSEQ.

When the CSEQ was first developed in 1979, it was tested empirically and critically for its validity and reliability at 10 colleges and universities (Dixon, 2003). The CSEQ, which relies on student self reports, is valid because it meets five

general criteria: “(1) the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways” (Kuh, Hayek, Carini, Ouimet, Gonyea, & Kennedy, 2001, p 9.). In addition, the CSEQ scales Alpha coefficients ranged from 82.0 to 92.0 indicating a high level of internal consistency and reliability (Dixon, 2003).

Since the development of the CSEQ, over 250 journal articles, books, and dissertation have cited its use (Gonyea, et. al. 2003). One example of these works includes Bauer’s 1995 study, which examined the differences in academic and social gains and development made by students from their freshman to their senior year. Another example is the work of Pike, Kuh, and Gonyea (2003) which examined the relationship between institutional mission, educational outcomes, and student involvement. Another example is one that was conducted at North Carolina State University by Karen Dixon (2003). The purpose of Dixon’s study was to identify factors associated with academic and social integration of freshmen in their first year of college. All three examples are works that incorporate the use of the CSEQ in their research.

Since the development and implementation of the CSEQ, additional questionnaires have been developed based on the research and writings of Astin, Tinto, Pace, Kuh and others to measure student experiences and involvement (Kuh et al. 2001). Those include: (a) The College Student Expectation Questionnaire –

CSXQ, (b) The National Survey of Student Engagement - NSSE, (d) The High School Survey of Student Engagement – HSSSE, and (e) The Law School Survey of School Engagement – LSSSE. Each of these questionnaires is administered by George Kuh at Indiana University. Each of these questionnaires provides insight and guidance into the development of the Doctoral Student Involvement Questionnaire.

Kuh's office was contacted with respect to this research. A project manager stated that none of their questionnaires were designed for doctoral students and that currently no questionnaire measures doctoral student involvement.

Graduate Student Involvement

Involvement is a concept that has been researched extensively in undergraduate education (Astin, 1977, 1984, 1993; Butcher, 1997; Kuh, G. D., Schuh, J. S. Whitt, E. G. & Associates, 1991; Pace, 1984; Pascerella, & Terenzini 1991; Pace & Kuh, 1998; Regeth, 2001; Pike, Kuh, & Gonyea, 2003; Terenzini, Springer, Pascerella, & Nora, 1995; Tinto, 1993). The Educational Resources Information Center (ERIC), a database service, which is sponsored by the U.S. Department of Education, provided over 600 journal articles addressing the subject of "student involvement". Yet very little of this research has addressed graduate student involvement (Denmon, 1987; Faghihi & Ethington, 1996). Even though there is limited information on graduate student involvement, it is important to briefly review the relevant research as well as the methods of measurement.

Alvin Denmon (1987) compared black and white graduate students' level of satisfaction and involvement at historically white and black institutions in the southeastern United States. To measure graduate student involvement the researcher developed the Graduate Student Involvement Questionnaire (GSIQ). The GSIQ consists of twenty dichotomous (yes, no) questions grouped into four sections: (a) faculty involvement, (b) professional involvement, (c) graduate student involvement, and (d) academic involvement. Content validity was assessed by asking professors to evaluate the questions, and reliability was assessed by using the test-retest procedure. Denmon found that white graduate students are more involved with faculty members at historically white institutions, while black graduate students are more involved with faculty members at the historically black institutions. This study was limited to dichotomous questions to measure involvement, and did not examine any specific field or discipline.

Faghihi and Ethington (1996) examined doctoral students' involvement and characteristics in their academic and social experiences as it influenced the student's perceptions of student development. The researchers administered a cross-sectional questionnaire to doctoral students at a Research I University in midwestern United States. The questionnaire contains three Likert-type scales (faculty, peer, and academic involvement) and a dichotomous question on graduate assistantships to measure doctoral student involvement. Faghihi and Ethington concluded that overall involvement, and especially intellectual and faculty involvement directly influences students' intention to persist. This study was limited

to only one institution and did not examine a specific field or discipline. In addition, this study measured only three areas of involvement.

Doctoral Student Research

Even though there are few studies focusing on doctoral student involvement, there have been numerous studies and articles on various aspects of doctoral education. Berelson (1960) and Bowen and Rudenstine (1992) are two well-known studies on doctoral education that focused on successful degree completion (Bair, 1999). Both multi-institutional and multi-disciplinary studies indicated the need to revise and revisit much of what was currently being done to reduce the attrition rates of doctoral students. In Berelson's (1960) study, doctoral students cited the lack of motivation as a major reason for not completing their degree. While in Bowen & Rudenstine's (1992) study, doctoral students cited the lack of funding as a major reason for not completing their degree. One area that both studies stressed was the need for increased faculty-student interaction.

Katz and Hartnett (1979) examined the graduate learning environment and how it affected graduate students' experiences. They found, as did Berelson, and Bowen and Rudenstine, that faculty involvement was critical to the success of the graduate students. Katz and Hartnett proposed five major dimensions of the graduate department environment that enrich students' experiences. Those dimensions include (a) student-faculty interaction and accessibility, (b) sense of community in the department, (c) the importance of teaching, (d) constant feedback and commitment, and (e) degree and curriculum flexibility.

Haworth and Bair (2000) conducted multi-institutional and multi-disciplinary interviews with doctoral students to better understand the purpose, character, and quality of the doctoral education. Based on the interviews the researchers identified five teaching and learning practices that enriched students' doctoral experiences.

> They include (1) the problematization of professional knowledge and practice, (2) the use of relational teaching and learning throughout the doctoral experience, (3) an emphasis on integrative inquiry, (4) individualized mentoring of students, and (5) student engagement in authentic, research based discovery activities (Haworth, & Bair, 2000, p 10).

They also indicated that much more research should be conducted on doctoral student culture. They end the article with this quote form from one of their many interviews, which I believe helps support the need to continue research on doctoral education.

> Doctoral education should be a place where something very dramatic happens in terms of how you start to think about yourself and about your contribution… [And] this is what we don't do in the doctoral education: [we don't] really sit down and start to look at, What does it mean for the student to be at the center of the learning experience? What do doctorally-prepared persons really have to do with what they know when they get out of here?…. What kind of communication skills, analytic skills, problem solving skills… do they have to have so that they can work in collaborative teams, interdisciplinary teams?… And what kind of commitment does that mean they need to have to society in a different way because of their preparation? What

responsibility does that bring for them? We don't spend time thinking about that in doctoral programs" (Haworth, & Bair, 2000, p 46).

In addition to the various studies on doctoral education, there are currently a few national initiatives created to help bring attention and reform to the doctoral education: Preparing Future Faculty (PFF), The Carnegie Initiative on the Doctorate, and The Responsive Ph.D (Nyquist, 2002). One other such initiative is the Re-envisioning the Ph.D project, which is funded by the Pew Charitable Trust. The purpose of this initiative is to inventory concerned stakeholders, foster national discussions, provide resources, disseminate findings, and support research to strengthen the doctoral education. The Re-envisioning project maintains a comprehensive Web site (www.grad.washington.edu/envision), hosts meetings and conferences, and conducts research.

Based on their research and other recent national studies on doctoral education, the Re-envisioning the Ph.D. project recently posted eight recommendations to help revise and reform the doctoral education (Nyquist, & Wulff, 2004). The first recommendation is to provide clear and detailed expectations for both future and current doctoral students. The doctoral students' department and advisors should be explicit on how students are selected, how their progress is assessed, their graduate job placement, and their completion rates. In addition, the department should track their students informally and formally to assess their experiences and overall satisfaction. The second recommendation is to provide sufficient mentoring. This would include having multiple mentors. Mentors should be trained on effective mentoring practice and have written guidelines. In addition,

mentors should facilitate discussion on issues such as research, teaching, career opportunities, and other developmental issues.

The third recommendation is to provide exposure to a broad number of career opportunities. Students should be encouraged to go off campus to explore other career options in business, industry, government, and non-governmental organizations. Students should have the opportunity to learn about the different aspects of higher education, such as their missions, the roles and responsibilities of administrators and faculty members, and the academic community inter-workings. In addition they should understand the different kinds of appointments on campus: tenure, term, and part-time appointments. The fourth recommendation is to provide students with a wide range of teaching preparation and exposure. Doctoral students should be taught how to teach in traditional venues such as in the classroom, and in one-on-one settings, but should also be taught how to teach as a project manager, program evaluator, and community participant.

The fifth recommendation is to recruit women and students of diverse culture and experiences. Women and faculty of color should assist in the recruitment and admission of graduate students. Departments and graduate schools should make it a priority to address issues of inclusion from a diverse graduate student population. The sixth recommendation is to produce scholar-citizens, with training that meets the needs of society and the global economy. Faculty members should encourage doctoral students to find connections between their own discipline and area of specialty and the needs of other disciplines, and society. In addition, they should be

given opportunities to learn about the relationships between academia and rest of society, both nationally and internationally.

The seventh recommendation is to provide a deep understanding of their respective discipline as well as have exposure to interdisciplinary lines of work. Students should have mentors in other disciplines. They should also have the opportunity and be encouraged to participate in inter-disciplinary, multi-disciplinary, and cross-disciplinary programs.

The eighth and last recommendation is to create partnership with all stakeholders in the doctoral education. These stakeholders include the doctoral students, the research-intensive institutions that prepare the students, and those that fund the doctoral students (government, foundations, and industry). In addition, stakeholders include those that influence the doctoral education (government boards, accreditation agencies, professional societies, and educational associations), and those that hire doctoral students (research-intensive universities, teaching-intensive universities, government agencies, business and industry, and non-government agencies) (Nyquist, & Wulff, 2004).

Leisure Studies and Doctoral Education

Little formal research has been conducted on the doctoral students in leisure education. Most of the research conducted describes the types of research and methods of analysis used by doctoral students (Valerius, & MacKay, 1993; Weissinger, Bowling, & Henderson, 1996) or profiles current doctoral students (Mak, Jamieson, & McLean, 1999; Schlatter, 2002).

The only article that the researcher found, which addressed leisure studies doctoral student preparedness was Kanters' (1992) article. The purpose of Kanters' research was to determine the amount and type of training doctoral students received to teach in higher education. Questionnaires were sent to faculty members asking them to indicate the amount of training they received as doctoral students. He found that most faculty members never received any formal training to teach in higher education. In addition, faculty members indicated that for the most part doctoral students are not prepared for the teaching challenges they will encounter in their first job as a faculty member. Based on Kanters' findings, he suggests that future university professors should receive more rigorous and intensive training in the art of teaching similar to training future elementary and high schools teacher receive. In addition, he suggested that doctoral students should take a course designed specifically to train them how to teach as well as give students the opportunity to teach in a "real" classroom environment.

As mentioned above, a few studies have profiled leisure studies doctoral students. Schlatter (2002) completed the most recent national study of both doctoral students and faculty members in leisure studies. Department chairpersons and program directors provided the doctoral student demographic information (Table 3).

Table 2.1: Doctoral Student Profile (Schlatter, 2002)

Demographic Variables	Percent	Frequency
Gender		
Female	41.0%	123
Male	55.0%	167
Non-Response	12%	12
Citizenship		
U.S. Citizen	69.0%	209
Non-Resident	21.0%	63
Non-Response	10.0%	30
U.S Citizen		
White, not of Hispanic origin	69.0%	201
Hispanic/Latino	1%	.
African American	8.7%	38
Asian American	0.2%	1
Native/ American Indian	1.8%	8
Non-Response	2.7%	12
Non-Resident		
Korea	17.0%	11
Canada	11.0%	7
China	11.0%	7
Taiwan	10.0%	6
England	6.0%	4
India	5.0%	4
Other	40.0%	25

Summary of Literature Review

Student involvement is a significant variable that influences the overall development of a student. Numerous studies have been conducted to better understand undergraduate student involvement. In addition, many assessment tools, such as the CSEQ and NSSE, have been developed to measure involvement. The information provided by the assessment tools has been essential in the development of policies and procedures that have engaged and integrated undergraduate students in the academic and social systems of the institution.

Most models of doctoral student development also include involvement as a significant variable, yet limited research has been conducted on doctoral student involvement. Because of the lack of research and high attrition and retention rates in doctoral students, it is important to understand the relationship between involvement and doctoral students. This study is one of the many studies that will need to be conducted regarding the correlation between involvement and doctoral education. Specifically, this study focuses on the development of an assessment tool to better understand the latent structure of involvement in leisure studies doctoral students.

CHAPTER 3

METHODS

The main purpose of Chapter 3 is to describe the procedures and design used in this research. In addition, this chapter illustrates how a non-traditional variable, involvement, can be measured with leisure studies doctoral students. The objectives of this study can be divided into five areas: (1) develop a profile of demographic background and characteristics of the leisure studies doctoral students, (2) develop an instrument and scale to measure involvement for this population, (3) determine the validity and reliability of the instrument and scale, (4) determine the latent structure of doctoral student involvement, and (5) measure doctoral student involvement. This chapter consists of eight sections: (1) Research Design, (2) Population, (3) Instrumentation, (4) Scale Development, (5) Validity and Reliability, (6) Data Collection, (7) Description of Variables, and (8) Data Reduction and Analysis.

Research Design

The research design used a quantitative (numerical data) survey questionnaire (Dillman, 2000). The questionnaire, Doctoral Student Involvement Questionnaire (DSIQ) and the doctoral involvement scale were designed specifically for this research, based on past research on undergraduate student involvement, previous instruments used to measure student involvement, and recent research on doctoral education. Data were collected at one point in time using the DSIQ.

Population

The population for this study was all students pursuing their Ph.D. or Ed.D. in leisure studies (which includes parks, recreation, tourism, therapeutic recreation and sport) at eighteen doctoral granting institutions in the United States. Leisure studies was examined because it is the researcher's field of study. In addition, only one discipline was examined because each field of study has its own specialized experiences and expectations (Tinto, 1993). The institutions were chosen based on The National Parks and Recreation Association (NRPA) listing of doctoral granting programs in recreation in the United States. NRPA is leisure studies' primary academic and professional organization. All eighteen institutions were contacted by an e-mail explaining the research and asking them to participate in the study, by providing the names and e-mail addresses of current doctoral students. Fifteen of the eighteen institutions agreed to submit the names of their students, and three institutions contacted the students directly and asked them to participate in the study. A total of 232 doctoral students were contacted asking them to participate in the study. Those students who agreed to participate were directed to a website to complete the on-line questionnaire.

Instrumentation

Leisure studies' doctoral students at 18 institutions were asked to complete the Doctoral Student Involvement Questionnaire (DSIQ), a Web-based questionnaire (Appendix C). Students received the questionnaire during the Summer of 2004. Only data obtained from the DSIQ were included in this research study. The DSIQ

is an assessment and evaluation instrument designed specifically for this study to measure doctoral student involvement. The DSIQ was modeled after previous instruments designed to measure involvement and the questions were designed based on past research on undergraduate student development and recent research on doctoral education.

The DSIQ was intended to measure doctoral students overall level of involvement during their doctoral education. Also the DSIQ was intended to measure the multiple dimensions (academic, research, teaching, social, institutional, professional, peer, and faculty) of doctoral student involvement. One purpose of the study was to determine the latent structure of doctoral student involvement and confirm the hypothesized eight dimensions. These hypothetical dimensions were based on previous research in involvement and doctoral education and the researcher is observations and experiences.

The DSIQ was seven pages long and divided into two major sections, Academic Information and Background Information. The Academic Information section is composed of ten dichotomous, ten Likert-type, and four multiple-choice questions. The Background Information section was composed of three dichotomous, one short answer, and eight multi-choice questions.

The Academic Information section was designed to have eight segments intended to coincide with the eight dimensions of involvement. Because the researcher did not want the labels to influence students' responses, the eight factors were not labeled on the questionnaire given to the participants. The eight segments included; academic, research, teaching, social, institutional, professional, peer, and

faculty. The academic segment was composed of two dichotomous, and two Likert-type questions. The research segment was composed of one dichotomous, one Likert-type, and one multiple-choice question. The teaching segment was composed of one dichotomous, one Likert-type, and one multiple-choice question. The institutional segment was composed of one Likert-type, and one multiple-choice question. The professional segment was composed of two dichotomous, and one Likert-type question. The peer segment was composed of one Likert-type question. The faculty segment was composed of one dichotomous, one Likert-type, and one multiple-choice question.

The doctoral involvement scale was divided into eight parts, one for each of the eight segments in the Academic Information section of the questionnaire. There were 58 items in the doctoral involvement scale. For two reasons the doctoral involvement scale was divided into parts instead of one long scale. The first reason was that a long scale is often tiring and respondents tend to become distracted with long scales and often do not complete the scale (Dillman, 2000). The second reason was that the items in each scale part were related to the other questions in the segment. This made the recall process less difficult for the respondents (Dillman, 2000).

The response categories for the scale parts were labeled “very often”, “often”, “sometimes”, and “never”, or “four or more times”, “2 to 3 times”, “once”, and “never” (never=low involvement, sometimes and once=moderately low involvement, often and 2 or 3 times=moderately high involvement, very often and four or more time=high involvement). The scale parts were:

1. Academic involvement (5 items)
    a. Used the library regularly for research/papers etc...
    b. Used computer facilities on campus for research etc...
    c. Assisted in bring speakers to campus
    d. Requested the library to subscribe to journal
    e. Requested the computing service to purchase software

2. Research involvement (7 items)
    a. Conducted research outside of course work
    b. Attended research seminars in discipline
    c. Attended interdisciplinary research seminars
    d. Generated and used research data
    e. Attended workshops or seminars on research ethics
    f. Attended workshops on research administration
    g. Reviewed papers for publication or presentation

3. Teaching involvement (4 items)
    a. Formally assessed your colleagues' teaching
    b. Formally assessed your own teaching
    c. Used the university's teaching development center
    d. Observed classes taught by others to learn about teaching

4. Social involvement (8 items)
    a. Attended departmental social events
    b. Attended graduate students associations socials
    c. Attended a play, dance, etc... sponsored by institution
    d. Attended sporting event sponsored by institutions
    e. Attended a concert or other music event sponsored by institution
    f. Participated in intramural athletics
    g. Participated in campus clubs, student organizations, or government
    h. Participated in activities to enhance your spirituality

5. Institutional involvement (7 items)
    a. Attended trips to other campuses to learn about other institutions/departments
    b. Attended workshops on career development/opportunities
    c. Attended workshops or seminars on roles and responsibilities of a professor
    d. Attended workshops on research administration
    e. Attended workshops or seminars on student development
    f. Attended workshops on the mission and purpose of higher education
    g. Served on committees to help craft policies, work on accreditation, engage in governance

6. Professional involvement (6 items)
    a. Attended trips to other campuses to learn about other institutions/departments
    b. Attended workshops on career development/opportunities
    c. Attended workshops or seminars on roles and responsibilities of a professor
    d. Attended workshops on research administration
    e. Attended workshops or seminars on student development
    f. Attended workshops on the mission and purpose of higher education

7. Peer involvement (10 items)
    a. Met outside of class with other students on campus for a meeting, discussion, or study group
    b. Met with fellow students to talk about current events
    c. Met with fellow students to talk about your research
    d. Met with fellow students to talk about teaching
    e. Met with students to talk about faculty advisors
    f. Met with student to talk about course work, plans of work, and faculty
    g. Attended departmental social events with other fellow students
    h. Attended informal dinners and get-together with other fellow students
    i. Interacted with students whose race or ethnic background is different from yours
    j. Interacted with students whose philosophy of life or personal values are different than yours
    k. Interacted with students whose family background are different than yours

8. Faculty involvement (11 items)
    a. Met with your advisor to discuss your advisor's research
    b. Met with your advisor to discuss your course work
    c. Met with your advisor to discuss professional organizations
    d. Met with your advisor to discuss current events in your discipline
    e. Met with your advisor to discuss your progress in the program
    f. Met with your advisor to discuss professional relationships with others in your discipline
    g. Met with your advisor to discuss applying and writing grants
    h. Met with your advisor to discuss your personal life
    i. Met with your advisor to discuss institutional events
    j. Met with your advisor to discuss departmental events

The Academic Information section also contained additional questions to provide supplementary information on the doctoral students' experiences. The supplementary questions asked if students attended class regularly, attended

graduate orientation, belonged to professional organizations, and had a primary faculty advisor. Also they asked the amount of time students spent reading, writing and studying. In addition, the supplementary questions asked if students were encouraged to participate in institutional and departmental activities, which include attending seminars and workshops on student development, teaching strategies, roles and responsibilities of college professors and developing teaching and research portfolios.

The Background Information section was composed of twelve socio-demographic questions. Questions ranged from gender, year of birth and marital status, to academic enrollment status and future career pursuits of the student. In addition, the section asked students if they had the chance "to do things over again" whether they would pursue their doctoral degree.

The supplementary and socio-demographic questions were included to fulfill the final objective of this study, which is to profile current leisure studies doctoral students. These questions provided additional information about the students' previous educational experiences, work/study habits, and additional educational opportunities/experiences.

Scale Development

The doctoral involvement scale was designed based on the theoretical construct of involvement. The transformation of this theoretical construct into an applicable measurement instrument followed Robert DeVellis's (1991) eight-step guideline to scale development. The initial step in developing the scale was to

develop a measurable construct. In this study the construct is doctoral student involvement. The theory of student involvement is well grounded, and the construct of doctoral student involvement does not currently have a formal assessment tool. The second step was to generate a large item pool that could measure involvement. As mentioned earlier, items were generated based on previous involvement instruments and research on doctoral education.

The third step was to determine a format for measurement. For this study it was been determined to use a Likert-type scale with equally weighted items. The respondents had four response options (“very often”, “often”, “sometimes”, and “never” or “four or more times”, “2 to 3 times”, “once”, and “never”). The fourth step was to have the item pool reviewed by experts in the field. Faculty members with expertise in undergraduate education, doctoral education, faculty development, leisure studies, and student development reviewed the item pool. The fifth step was to include items to help validate the questionnaires. Supplementary questions that have been used previously in other studies in involvement were included in the study. Another issue that step five addressed was social desirability. The questionnaire and analysis were designed so that respondent’s data was kept confidential; respondent’s data was not matched with their personal information, and individual responses were not published.

The sixth step was to test the questionnaire with a sample group. A group of 16 doctoral students in leisure studies completed the DSIQ. The seventh step was to re-evaluate the scale and items. The scale and items were revised based on the sample group’s recommendation and preliminary analysis of the data. The eighth

and final step was to optimize the length of the scale. The DSIQ takes approximately 10 minutes to complete, less than the CSEQ and NSSE, both take approximately 20-30 minutes.

Validity and Reliability

A priority of this research was to develop a valid and reliable questionnaire to measure doctoral student involvement. Validity and reliability are critical issues that were addressed during the conceptualization, construction and analysis of the questionnaire and scale. The validity and reliability were assessed at many different levels and different stages in this study.

Content validity was established by having faculty members with expertise in undergraduate education, doctoral education, faculty development, leisure studies, and student development accesses the DSIQ and doctoral involvement scale (Denmon, 1987). A few items were reworded, reorganized and a few of the supplementary questions were strengthened based on the faculty members' assessment.

The DSIQ relied on self-reported information. Often with self-reports, two general problems can affect the accuracy of the data. The first is the inability of respondents to provide accurate answers, and the second is the unwillingness of respondents to provide truthful information (Kuh, Hayek, et al. 2001). Self-reports are likely to be valid if they meet five general conditions: "(1) the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think

the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of the respondent or encourage the respondent to respond in socially desirable ways" (Kuh, Hayek, et al. 2001, p 9.). The DSIQ was designed to meet those general conditions.

The DSIQ was administered in the Summer of 2004. All participants had a minimum of one year of experience in their doctoral education. Each participant had sufficient experience with their doctoral education, department and institution to provide accurate responses. Also, questions were worded clearly and formatted based on previous involvement and doctoral questionnaires.

Doctoral students have different experiences and participate in different activities during different stages in their doctoral education (Tinto, 1993). Doctoral students were asked to recall the frequency of activities "during the entire doctoral education". This goes against most other involvement studies that ask students to recall activities during the last six months" or "last year". The researcher decided to measure the entire doctoral education instead of one year or the last few months in order to capture activities and experiences that may have been undertaken during the first few years that may not have been done during the final stages of the doctoral education. For example, a first year doctoral student may only be taking courses and not have started their research or taught a class, while a third or fourth year doctoral student may have completed their course work and teaching and conducted their independent research. As a limitation to the current study, the retrieval process may have been difficult for some doctoral students if they had been

in the doctoral process an extended period of time or stopped and restarted their doctoral education.

The doctoral process is one that takes a substantial amount of personal time and commitment. The DSIQ questions were designed to make students reflect seriously about their commitment, and to think about how their experiences and activities have affected their progress and preparedness. The questionnaire was designed to be completely confidential. Participant's personal information was not matched with responses and no individual participant's information was shared or published. This privacy allows students to answer honestly. In addition, the questions were designed not to be threatening, embarrassing, or incriminating.

A test-retest procedure was conducted to help establish the reliability of the DSIQ. The test-retest procedure refers to asking students to complete the questionnaire at two different points in time to see if their responds are consistent. Test-retest procedure measures the stability of an instrument (Kuh, Hayek, et al., 2001). The DSIQ was administered to 16 doctoral students at one doctoral granting institution in the spring of 2004. Four weeks later the same 16 doctoral students received the same questionnaire. The test-retest groups' responses were evaluated for consistency.

In addition, the reliability of the doctoral involvement scale was estimated by Cronbach's alpha. Cronbach's alpha is a common estimate of reliability of items in a scale, and should be .70 or higher for a set of items to be considered a scale (Garson, 2003)

Data Collection

Eighteen doctoral granting institutions with a focus in leisure studies were contacted and asked to provide their current doctoral students' name and e-mail addresses (Appendix D). A list of 232 students received an e-mail during the summer of 2004 inviting them to participate in the study (Appendix E). Included in the e-mail were an explanation of study, a confidential statement, a web-link to the questionnaire, password, username and personalized code number. A reminder e-mail was sent two weeks later to students who had not responded (Appendix F). Nineteen e-mails were returned as undeliverable. One hundred and nineteen students agreed to participate, linked to the questionnaire, and completed the questionnaire. When the respondents completed the questionnaire and submitted their responses, the data were transferred automatically to a password-protected server on the researcher's university campus. Four completed questionnaires were eliminated from the analysis because over half of the questionnaire was incomplete. A total of 115 usable questionnaires were returned with a response rate of 53.7%.

Description of Variable

The only variable in this study was involvement. As defined earlier, involvement is "the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984, p. 518). One objective of this study was to measure the level of involvement and uncover the latent structure of doctoral student involvement. There was no need to classify involvement as either a dependent or an independent variable because of the type of analysis (factor

analysis) conducted. Doctoral student overall involvement was measured by an eight part scale composed of 58 items. The researcher hypothesized that doctoral student involvement's latent structure is composed of eight dimensions (academic, research, teaching, social, institutional, professional, peer, and faculty). The explanations of the eight dimensions are described in more detail in the instrumentation section above.

Data Reduction and Analysis

The first two research questions involved the validity and reliability of the DSIQ and doctoral student involvement scale. Their assessment was addressed above in the Validity and Reliability section. Exploratory factor analysis was used to determine the latent structure of doctoral student involvement (Garson, 2003). Exploratory factor analysis was chosen over confirmatory factor analysis because little was known of the factor loading of doctoral student involvement even though this research was based on prior theory.

The intent of factor analysis is to discover the latent structure of a set of correlated yet independent variables. The analysis uncovers patterns of correlation among variables thought to help explain a theoretical structure (Tabachnick & Fidell, 2001). Factor analysis analyzes the data and attempts to find a linear combination of items so that maximum variance is extracted from the item. The maximum variance is then removed and the program searches for a second linear combination, which can explain the remaining portion of variance. It will continue to

search for linear combinations until all the explained variance is extracted. This extraction process will produce uncorrelated factors (Garson, 2003)

Factor analysis can be used for many purposes. Three of those purposes include: (1) reducing large number of variables to a small number of factors, (2) identifying patterns in a set of variables, and (3) validating a scale or index (Garson, 2003). The Doctoral Student Involvement Questionnaire contained 58 items that composed the Doctoral Student Involvement Scale. It was important to determine if those 58 items accurately measured doctoral student involvement, what patterns existed in the data and if those items are correlated. Based on the functions of factor analysis and the goals of the study, data, and previous studies comparable to this study, it was deemed the appropriate statistical procedure.

The type of factor analysis used was principle component analysis (PCA) with Varimax rotation. Eigenvalues were used to determine the variance of all items accounted for by a particular factor which assists in determining how many factors to extract from the scale. The higher the eigenvalue the more it contributes to the explanation of variance in the items. A factor with a low eigenvalue may indicate redundancy (Garson, 2003). A scree plot was also used to determine the number of factors. The scree plot is a visual aid that plots factors on the horizontal axis, and the eigenvalues on the vertical axis.

An additional factor analysis and reliability analysis was used to validate the doctoral involvement scale and reduce any of the redundant and non-essential items. Items factors score, corrected item-total correlation, alpha if deleted, and goodness of fit were accessed to determine which items should be eliminated from

the analysis. After testing the DSIQ for number of factors and reliability, the mean factor scores were used to determine level of involvement (1=low involvement, 2=moderately low involvement, 3=moderately high involvement, 4=high involvement).

CHAPTER 4

RESULTS

The main purpose of Chapter 4 is to present the collected data and the results of the analysis performed on the pilot study and primary study. This chapter consist of eight sections: (1) Pilot Study, (2) Test-Retest Results, (3) Socio-Demographic Summary, (4) DSIQ Descriptive Summary, (5) Data Reduction, (6) Factor Analysis, (7) Reliability Analysis, and (8) Results Summary.

Pilot Study

The purpose of the pilot study was to evaluate the instrument's grammar, form, readability, content, and method of delivery. In addition, it was used to assist in establishing reliability of the instrument. The participants in the pilot study were doctoral students in leisure studies at a southeastern Research I university. A total of 16 students were asked to participate in the pilot study. All 16 doctoral students completed the original questionnaire in Spring 2004 and 15 completed a revised questionnaire in Summer 2004.

In addition to completing the questionnaire, participants were asked to inform the researcher of any questions, response categories, or instructions that were poorly worded, confusing and or ambiguous. Based on the participants' recommendations, six questions were revised and one additional question was included. Question D's instruction was reworded because participants felt that the number of hours spent reading, writing, and studying depended on their courses, and current academic focus. (Question D was not included in the involvement scale).

Questions F, H, M, & O response category was revised from Very Often – Often – Sometimes – Never to Four or more Times – 2 to 3 times – Once – Never. Respondents stated that the Very Often – Often – Sometimes – Never was difficult to quantify and needed a numerical amount to eliminate vague and widely varied interpretations (Dillman, 2000). (Questions F, H, M, & O were included in the involvement scale). Question 11 (career path) was revised to allow for multiple responses. In addition, respondents believed a question asking whether doctoral students currently have children or dependent living in their home should be included. Participants were also asked to comment on the length and appearance of the web-based questionnaire. Respondents felt both the length and appearance were appropriate.

Test - Retest Results

The results indicate consistency between the test-retest data collected in Spring 2004 and Summer 2004, with the same students. The major difference between the Spring 2004 and Summer 2004 data is that the Summer 2004 version contained one less respondent. Table 4.1 provides a comparison of the demographic test-retest results. A majority of respondents were White, not of Hispanic origin and married. The pilot studies had a relatively even number of males and females with a median age of 32 and a range from 26 to 51 years. The majority of respondents were full-time students and had received an undergraduate or master's degree in leisure studies.

Participants were spread across all four academic stages. A majority of the respondents indicated that their primary career path was as a professor at a university or college and they would pursue their doctoral education at their current institution again "if they have the chance to do things over again". The frequency, mean, median, and range between the data collected in the Spring 2004 and Summer of 2004 were consistent.

Table 4.1: Demographic Comparison between the Test-Retest Respondents

Demographic Variables	Spring 2004	Summer 2004
Gender		
Female	50.0%	53.3%
Male	50.0%	46.7%
Race		
White, not of Hispanic origin	75.0%	80.0%
Hispanic/Latino	6.3%	6.7%
African American	12.5%	6.7%
Other	6.3%	6.7%
Age	Median: 32 Mean: 36 Range: 26-51	Median: 32 Mean: 35 Range: 26-51
Marital status		
Single	37.5%	26.7%
Married	56.3%	66.7%
Divorced	6.3%	6.7%
Years Enrolled in Doctoral Studies	Median: 2.0 Mean: 2.6	Median: 3.0 Mean: 3.6
Less than a year	12.5%	13.3%
One	18.8%	26.7%
Two	25.0%	20.0%
Three	6.3%	6.7%
Four	18.8%	13.3%
Five	12.5%	13.3%
Six	6.3%	0.0%
Seven	0.0%	6.7%

Table 4.1 Continues		
Current Enrollment Status		
Full-time	62.5%	66.0%
Part-time	31.3%	33.3%
Non-response	6.3%	0.0%
Grades		
A+	18.8%	13.3%
A	68.8%	80.0%
A-	12.5%	6.7%
Undergraduate or Master's Degree in Leisure Studies		
No	31.3%	21.4%
Yes	68.8%	73.6%
Non-response	0.0%	6.7%
Current Academic Stage		
Taking course	43.8%	40.0%
Just finished course work	18.8%	20.0%
Completed preliminary exam	31.3%	40.0%
Completed dissertation	6.3%	0.0%
Career Path		
Professor at a college or university (faculty position)	100.0%	86.7%
Non-response	0.0%	13.3%
Pursue doctoral education if had chance to do things over again		
No	12.5%	0.0%
Yes	81.3%	80.0%
Yes, but only at a different institution	6.3%	13.3%
Non-response	0.0%	6.7%

Item mean, scale mean, scale standard deviation and Cronbach Alpha were conducted for the test-retest data (Table 4.2, & Table 4.3) . The purpose of this was to determine consistency and reliability of the Doctoral Student Involvement Questionnaire, and the eight hypothesized dimensions. The item mean for the 58 item DSIQ scale collected in Spring 2004 was 2.13, with an alpha of .93, while the with 58 item scale collected in Summer 2004 was 2.34 with a alpha of .92. The

means, standard deviation and alpha were similar for both the data collected in the Spring 2004 and Summer 2004. These results indicate a high level of consistency among the DSIQ questions.

Table 4.2: Spring 2004 Results of Doctoral Student Involvement Scale and Hypothesized Dimension Means and Alpha Coefficients

Scale Dimensions	# of Variables	Item Mean	Scale Mean	Scale SD	Alpha
DSIQ	58	2.13	124.06	22.63	.93
Academic	5	2.10	10.50	2.36	.47
Research	7	2.33	16.31	3.66	.75
Teaching	4	1.81	7.25	3.53	.44
Social	8	1.96	15.68	4.15	.70
Institutional	7	1.85	13.00	3.14	.72
Professional	6	2.02	12.12	2.96	.60
Peer	11	2.55	28.12	5.69	.83
Faculty	10	2.10	21.06	7.79	.92

Note. N = 16 for all items.

Table 4.3: Summer 2004 Results of Doctoral Student Involvement Scale and Hypothesized Dimensions Means and Alpha Coefficients

Scale Dimensions	# of Variables	Item Mean	Scale Mean	Scale SD	Alpha
DSIQ	58	2.34	135.73	23.00	.92
Academic	5	2.21	11.06	1.70	.33
Research	7	2.78	19.46	4.12	.78
Teaching	4	2.21	8.86	3.09	.69
Social	8	2.03	16.26	4.21	.66
Institutional	7	2.38	16.00	5.00	.82
Professional	6	2.46	14.80	3.70	.63
Peer	11	2.63	29.00	5.01	.78
Faculty	10	2.02	20.26	7.69	.94

Note. N = 15 for all items.

Socio-Demographic Summary (Main Study)

An objective of the study was to profile current leisure studies doctoral students. Descriptive and socio-demographic questions were included in the questionnaire. Table 4.4 displays the socio-demographic questions of the current leisure studies doctoral students. The majority of respondents were female (53.0%), White, not of Hispanic origin (64.3%), married (56.5%) and with no children or dependents living in their home (79.1%). Ages ranged from 25-55 with a mean age of 34. Most respondents were full-time students (83.5%) and had an undergraduate or master's degree in leisure studies (67.0%). Respondents were evenly split in the number of years they had been enrolled in their doctoral studies (one or more years – 28.7%, two years – 26.1%, three years 20.0%, four or more years – 23.2%) and their current academic stage (taking courses – 40.0%, finished course work – 21.7%, and completed preliminary exam 33.0%). A majority of respondents would pursue their doctorate degree " if they had the chance to do it again" (70.4%) and

planned on becoming a professor at a university when they finished their doctoral degree (78.4%)

Table 4.4: Socio-Demographic Characteristics of the Respondents

Demographic Variables	Percent	Frequency
Gender		
Female	53.0%	61
Male	47.0%	54
Race		
White, not of Hispanic origin	64.3%	74
Asian American	6.1%	7
Hispanic/Latino	2.6%	3
African American	3.5%	4
Multiracial	0.9%	1
Other	19.1%	22
Non-Response	3.5%	4
Age	Median: 32	Mean: 34
	Range: 25-55	
Marital status		
Single	34.8%	40
Married	56.5%	65
Living with partner	4.3%	5
Divorced	3.5%	4
Separated	0.9%	1
Children or Dependents Living in Your Home		
No	79.1%	91
Yes	20.9%	24
Years Enrolled in Doctoral Studies		
Less than a year	7.0%	8
One	21.7%	25
Two	26.1%	30
Three	20.0%	23
Four	15.7%	18
Five	5.2%	6
Six	1.7%	2
Seven	1.7%	2
Eight or more	0.9%	1
Current Enrollment Status		
Full-time	83.5%	96
Part-time	16.5%	19

Table 4.4 Continued		
Non-response		
Grades		
A+	8.7%	10
A	66.1%	76
A-	17.4%	20
B+	5.2%	6
B	2.6%	3
Undergraduate or Master's Degree in Leisure Studies		
No	16.5%	19
Yes	67.0%	77
Non-response	16.5%	19
Current Academic Stage		
Taking course	40.0%	46
Just finished course work	21.7%	25
Completed preliminary exam	33.0%	38
Completed dissertation	4.3%	5
Non-Response	0.9%	1
Career Path (Multiple Response)		
Professor at a college or university (faculty position)	87.0%	100
Research at a college or university (non-faculty position)	13.0%	15
Administrator at a college or university	17.4%	20
Researcher in public, non-profit or government agency	27.8%	32
Administrator/Manager in public, non-profit or government agency	16.5%	19
Researcher in business, industry, or private sector	18.3%	21
Administrator/Manager in business, industry, or private sector	11.3%	13
Independent researcher, consultant, or writer	21.7%	25
Teacher (not in higher education)	6.1%	7
Self-employed	11.3%	13
Non-response		
Pursue doctoral education if had chance to do things over again		
No	7.8%	9
Yes	70.4%	81
Yes, but only at a different institution	17.4%	20
Non-response	4.3%	5

In addition to the 12 demographic questions, 26 descriptive questions were included in the study. The descriptive characteristics of the current leisure studies doctoral students are presented in Appendix G.

DSIQ Descriptive Summary

Table 4.5 provides the frequency, mean and standard deviation of the 58 items in the DSIQ scale. These data provided insight into the activities leisure studies doctoral students participated in the most often and which activities they were involved in the least and or not at all.

Table 4.5: Percentage, Mean, and Standard Deviation of DSIQ

Items	1*	2*	3*	4*	Mean	SD
Used the library regularly for research/papers etc...	0.9%	16.5%	25.2%	57.4%	3.39	0.791
Used computer facilities on campus for research etc...	3.5%	13.9%	20.0%	62.6%	3.42	0.858
Assist in bringing speakers to campus	55.7%	36.5%	7.0%	0.9%	1.53	0.667
Request the library to subscribe to journal	51.3%	34.8%	8.7%	5.2%	1.68	0.843
Request the computing service to purchase software	60.9%	31.3%	7.8%	0.0%	1.47	0.640
Conducted research outside of course work	14.8%	16.5%	36.5%	32.2%	2.86	1.034
Attended research seminars in discipline	4.3%	14.8%	33.0%	47.8%	3.24	0.864
Attended interdisciplinary research seminars	21.7%	23.5%	37.4%	17.4%	2.50	1.021
Generated and used research data	9.6%	16.5%	37.4%	36.5%	3.01	0.960
Attended workshops or seminars on research ethics	36.5%	35.7%	22.6%	5.2%	1.97	0.898
Attended workshops on research administration	47.0%	26.1%	23.5%	3.5%	1.83	0.907
Reviewed papers for publication or presentation	34.8%	20.0%	29.6%	15.7%	2.26	1.101
Formally assessed your colleagues' teaching	54.8%	14.8%	17.4%	13.0%	1.89	1.114
Formally assessed your own teaching	53.9%	18.3%	20.9%	7.0%	1.81	0.999
Used the university's teaching development center	63.5%	9.6%	16.5%	10.4%	1.74	1.077
Observed classes taught by others to learn about teaching	28.7%	15.7%	32.2%	23.5%	2.50	1.142
Attended departmental social events	5.2%	40.0%	27.0%	27.8%	2.77	0.918
Attended graduate students associations socials	35.7%	45.2%	12.2%	7.0%	1.90	0.868
Attended a play, dance, etc... sponsored by institution	26.1%	52.2%	15.7%	6.1%	2.02	0.816
Attended sporting event sponsored by institutions	26.1%	45.2%	9.6%	19.1%	2.22	1.041
Attended a concert or other music event sponsored by institution	44.3%	41.7%	6.1%	7.8%	1.77	0.879
Participated in intramural athletics	61.7%	27.8%	8.7%	1.7%	1.50	0.730
Participated in campus clubs, student organizations, or government	52.2%	31.3%	7.0%	9.6%	1.74	0.956
Participated in activities to enhance your spirituality	48.7%	23.5%	9.6%	18.3%	1.97	1.151
Attended trips to other campuses to learn about other institutions/departments	66.1%	15.7%	13.9%	4.3%	1.57	0.890
Attended workshops on career development/opportunities	40.0%	35.7%	21.7%	2.6%	1.87	0.843
Attended workshops or seminars on roles and responsibilities of a professor	51.3%	25.2%	16.5%	7.0%	1.79	0.960
Attended workshops on research administration	56.5%	29.6%	13.0%	0.9%	1.58	0.749
Attended workshops or seminars on student development	66.1%	19.1%	9.6%	5.2%	1.54	0.871
Attended workshops on the mission and purpose of higher education	69.6%	19.1%	9.6%	1.7%	1.43	0.739
Served on committees to help craft policies, work on accreditation,	64.3%	23.5%	9.6%	2.6%	1.50	0.777

Table 4.5 Continued						
Attended trips to other campuses to learn about other institutions/departments	6.1%	13.9%	35.7%	44.3%	3.18	0.894
Attended workshops on career development/opportunities	53.9%	17.4%	22.6%	6.1%	1.81	0.990
Attended workshops or seminars on roles and responsibilities of a professor	53.0%	20.0%	16.5%	10.4%	1.84	1.048
Attended workshops on research administration	13.9%	27.0%	35.7%	23.5%	2.69	0.986
Attended workshops or seminars on student development	58.3%	19.1%	12.2%	10.4%	1.75	1.033
Attended workshops on the mission and purpose of higher education	24.3%	30.4%	27.8%	17.4%	2.38	1.039
Met outside of class with other students on campus for a meeting, discussion, or study group	5.2%	31.3%	32.2%	31.3%	2.90	0.912
Met with fellow students to talk about current events	17.4%	42.6%	23.5%	16.5%	2.39	0.962
Met with fellow students to talk about your research	13.0%	51.3%	20.9%	14.8%	2.37	0.893
Met with fellow students to talk about teaching	29.6%	42.6%	15.7%	12.2%	2.10	0.968
Met with students to talk about faculty advisors	16.5%	51.3%	19.1%	13.0%	2.29	0.896
Met with student to talk about course work, plans of work, and faculty	8.7%	39.1%	34.8%	17.4%	2.61	0.876
Attended departmental social events with other fellow students	6.1%	41.7%	32.2%	20.0%	2.66	0.867
Attended informal dinners and get-together with other fellow students	6.1%	46.1%	22.6%	25.2%	2.67	0.925
Interacted with students whose race or ethnic background is different from yours	0.9%	31.3%	32.2%	35.7%	3.03	0.843
Interacted with students whose philosophy of life or personal values are different than yours	5.2%	34.8%	35.7%	24.3%	2.79	0.874
Interacted with students whose family background are different than yours	5.2%	34.8%	29.6%	30.4%	2.85	0.920
Your advisor's research	24.3%	37.4%	17.4%	20.9%	2.35	1.068
Course work	12.2%	51.3%	28.7%	7.8%	2.32	0.790
Professional organizations	42.6%	47.0%	4.3%	6.1%	1.74	0.807
Current events in your discipline	28.7%	47.0%	15.7%	8.7%	2.04	0.892
Your progress in the program	9.6%	39.1%	32.2%	19.1%	2.61	0.905
Professional relationships with others in your discipline	37.4%	37.4%	13.9%	11.3%	1.99	0.987
Applying and writing grants	44.3%	35.7%	11.3%	8.7%	1.84	0.942
Your personal life	32.2%	46.1%	12.2%	9.6%	1.99	0.913
Institutional events	39.1%	47.0%	9.6%	4.3%	1.79	0.789
Departmental events	25.2%	49.6%	18.3%	7.0%	2.07	0.845

Note. N = 115 for all items.

* 1 – Never, 2 – Sometimes/Once, 3 – Often/2 or 3 times, 4 – Very Often/ 4 or more times

Data Reduction

An initial principle component analysis and reliability analysis were conducted on the 58 items that comprise the doctoral student involvement scale. The initial analysis ran without any restriction and produced a correlation matrix, communalities, Eigenvalues, scree plot, and factor loadings. The purpose of this initial analysis was to determine the number of factors and assist in reducing items in the DSIQ to get a more parsimonious scale.

The data reduction process is subjective with no one definitive test to decide which variables should be dropped (Garson, 2003). Three criteria were used in this study to reduce variables: corrected inter-item correlation, factor score and goodness of fit. The corrected inter-item correlation measures the level of consistency between the variable and the scale or factor. A corrected inter-item correlation below .300 is considered low and indicates a weak relationship. The factor score is an indicator of goodness of fit. The factor score measures the linear combination of all of the original variables that were relevant in making a new factor. A factor score below .300 is considered low and adds little value to the factor. Also, goodness of fit is based on the operational definition of the variable and the factor it loads on.

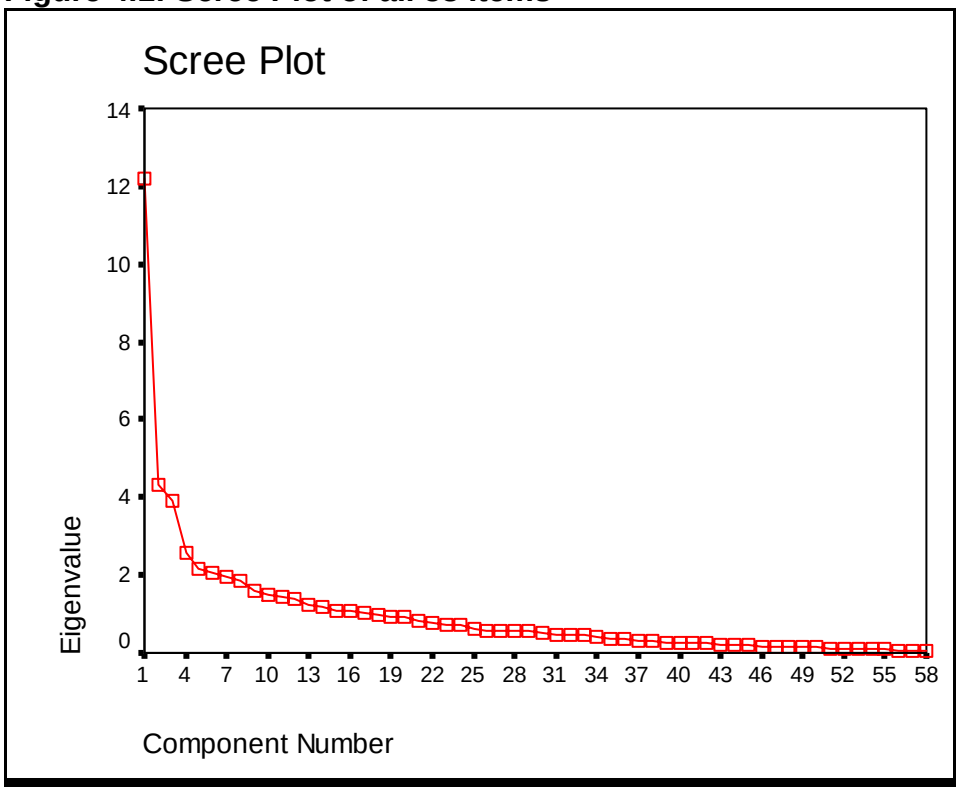
The initial correlation matrix and the correlation coefficient are listed in Appendix H. The correlation coefficients provide an indication of which sets of variables cluster together. Factor analysis uses the correlations matrix to establish which items group together into factors. Coefficients close to or near zero indicate a

good factor model (Garson, 2003). The majority of the variables in the correlation matrix had coefficients close to zero with no coefficient over .7800.

Communalities of the 58 items are listed in Appendix I. Communalities measure the percentage of variance explained in a given variable explained by all the factors (Garson, 2003). A low communality (below .250) may indicate that a variable should be removed from the analysis. The initial communalities ranged from .847 (PEERSOCI) to .602 (ACASPEAK), which is an acceptable range. Communality score is important but is insignificant if the variable does not load on a factor that is interpretable.

The initial eigenvalues are presented in Appendix J. The eigenvalue is the proportion of variance in all the items that are accounted by that factor. A low eigenvalue contributes little to the explanation of the variance of a variable and may be redundant. The analysis extracted 17 factors with an eigenvalue of one or greater with a total variance explained of 73.397. A scree plot is presented in Figure 4.1. A scree plot is one method of determining the number of factors in a set of variables (Garson, 2003). The chart plots the components on the X axis and the corresponding eigenvalues on the Y axis. As one moves along the X axis it appears that there is no major drops or elbow after the fourth component. The scree plot displays four distinct factors.

Figure 4.1: Scree Plot of all 58 Items



Appendix K displays the initial factor loadings of the seventeen factors of all 58 items. Seventeen factors are presented. The seventeen factors were reviewed and analyzed and the research tried to place labels on the seventeen factors. It became apparent that the seventeen factors were not interpretable and the factors needed to be reduced to become interpretable.

The decision of the number of factors was based on the scree plot and the visual inspection of several trial solutions. As indicated above the initial factor analysis was conducted by not restricting the number of factors which produced 17 factors with eigenvalues above one. In addition, analysis was conducted by limiting the factors to 11, 8 and 4. After studying and analyzing all four different analysis and reviewing their respective factor loadings, scree plot, and eigenvalues strengths, it

was determined that the four-factor solution produced the most interpretable and parsimonious scale.

Appendix L displays the total variance explained and eigenvalues of all 58 items restricted to only four factors. The total variance explained for the four factors was 39.368. Factor four's eigenvalue was 2.58. Table 4.6 displays the rotated factor loading of all 58 items restricted to only four factors. The four factors were labeled based on the items that loaded on the factors. Factor 1 was labeled Peer and Social Involvement. Factor 2 was labeled Faculty Involvement. Factor 3 was labeled Academic and Professional Involvement. Factor 4 was labeled Research Involvement.

4.6: Rotated Factor Loadings of all 58 Items Restricted to Only Four Factors

	1	2	3	4
Interacted with students whose race or ethnic background is different from yours	**.758**	3.592E-02	3.261E-02	.217
Met with fellow students to talk about teaching	**.728**	.180	.277	-1.937E-02
Attended informal dinners and get-together with other fellow students	**.713**	.109	.162	.188
Interacted with students whose family background are different than yours	**.704**	2.223E-02	1.512E-02	.140
Interacted with students whose philosophy of life or personal values are different than yours	**.700**	7.194E-02	-2.328E-03	.271
Met with fellow students to talk about your research	**.672**	.307	.104	4.792E-02
Attended departmental social events with other fellow students	**.663**	.169	.329	.202
Met with student to talk about course work, plans of work, and faculty	**.655**	.237	-2.324E-02	-7.539E-03
Met outside of class with other students on campus for a meeting, discussion, or study group	**.652**	.154	.137	2.416E-02
Met with fellow students to talk about current events	**.652**	.213	-9.558E-02	-4.363E-02
Met with students to talk about faculty advisors	**.652**	.167	-3.182E-02	-8.880E-02
Attended departmental social events	**.529**	8.501E-02	.275	.255
Observed classes taught by others to learn about teaching	**.446**	-2.133E-02	.426	.107
Attended a play, dance, etc... sponsored by institution	**.412**	.116	9.510E-02	.196
Attended graduate students associations socials	**.375**	-2.451E-02	.203	-4.864E-03
Request the computing service to purchase software	**.284**	.242	.116	.127
Used computer facilities on campus for research etc...	**.264**	8.729E-02	-.232	1.549E-02
Attended a concert or other music event sponsored by institution	**.239**	-9.657E-02	8.388E-02	.208
Formally assessed your colleagues' teaching	**.157**	.116	-2.055E-02	4.631E-02
Current events in your discipline	9.172E-02	**.791**	.184	.126
Institutional events	.156	**.779**	1.832E-02	.156
Professional relationships with others in your discipline	.324	**.753**	.188	.222
Course work	.112	**.732**	9.820E-03	-3.576E-02
Departmental events	.249	**.701**	6.570E-02	.175
Professional organizations	8.090E-02	**.686**	.240	9.103E-02
Applying and writing grants	9.043E-02	**.674**	5.646E-02	.219
Your personal life	.171	**.655**	3.044E-02	7.455E-02
Your advisor's research	5.098E-02	**.648**	5.901E-02	.366
Your progress in the program	.260	**.632**	.202	.153
Participated in campus clubs, student organizations, or government	.146	**-.338**	.245	.116
Request the library to subscribe to journal	2.458E-02	**.211**	3.190E-02	2.738E-02
Participated in activities to enhance your spirituality	-2.615E-02	**-.147**	2.150E-02	.103
Participated in intramural athletics	-8.028E-02	**-9.696E-02**	6.540E-02	-7.150E-02
Attended workshops or seminars on student development	5.797E-02	.244	**.731**	7.463E-02
Attended workshops or seminars on research ethics	-2.015E-02	3.232E-02	**.718**	4.195E-02
Attended workshops on research administration	2.902E-02	.157	**.673**	3.147E-02
Attended workshops on research administration	6.611E-02	.251	**.642**	.122
Attended workshops or seminars on roles and responsibilities of a professor	.196	.188	**.609**	2.322E-02
Attended workshops on the mission and purpose of higher education	-5.600E-02	.224	**.560**	.110
Used the university's teaching development center	.279	-.103	**.508**	3.672E-02

Table 4.6 Continued				
Attended workshops on career development/opportunities	-2.302E-02	.413	**.495**	.178
Participated in an outreach or extension project	.119	-6.044E-02	**.481**	.169
Assist in bring speakers to campus	4.146E-02	6.159E-02	**.372**	.301
Formally assessed your own teaching	.257	-3.946E-02	**.330**	-6.985E-02
Served on committees to help craft policies, work on accreditation, engage in governance	.184	-.115	**.329**	.161
Worked collaboratively on writing for publication	.122	.234	9.605E-02	**.715**
Conducted research outside of course work	1.072E-02	.196	8.707E-02	**.690**
Worked in a team on research	.145	.216	-4.587E-02	**.674**
Generated and used research data	.144	.286	7.633E-02	**.586**
Attended sporting event sponsored by institutions	.287	1.845E-02	5.863E-02	**.543**
Attended professional conferences or meeting	.404	3.144E-02	.280	**.484**
Attended interdisciplinary research seminars	-1.535E-02	.123	.379	**.482**
Attended research seminars in discipline	.198	.135	.312	**.479**
Attended trips to other campuses to learn about other institutions/departments	-7.203E-02	-5.247E-02	.238	**.372**
Reviewed papers for publication or presentation	4.494E-02	.124	.161	**.369**
Worked in a team on teaching	.178	-.109	.291	**.338**
Participated in consulting projects not associated with your department or institutions	9.003E-02	2.536E-02	-8.083E-02	**.327**
Used the library regularly for research/papers etc...	-.176	7.957E-02	-5.824E-03	**.192**

The four final factors were more interpretable compared to the original seventeen factors. To measure the reliability of the four factors and to get a better indication of which variables should be dropped from the scale a Reliability Analysis was conducted on the entire 58 item scale and each individual factor. The Cronbach's alpha for the overall scale with all 58 items was .9182. The Cronbach's alpha for the first factor with 19 items was .8773, the second factor with 14 items was .8159, third factor with 12 items was .8169, and the fourth factor with 13 items was .7970.

The corrected item-total correlation and scale's alpha if deleted for the 58 item DSIQ scale are presented in Table 4.7. A few corrected item-total correlations were low for both the entire 58 item scale and individual factors. There were 11 variables on the 58 item scale that had a corrected item-total correlation score of less than .3000 and an individual factor loaded score of less than .3250. Those

eleven variables and their respective corrected item-total correlation are listed in Table 4.8.

Table 4.7: Corrected Item-Total Correction and Alpha if Deleted

Items	Corrected Item-Total Correlations	Alpha If Deleted
Used the library regularly for research/papers etc...	.0235	.9195
Used computer facilities on campus for research etc...	.1177	.9190
Assist in bring speakers to campus	.3360	.9173
Request the library to subscribe to journal	.1494	.9187
Request the computing service to purchase software	.3786	.9171
Conducted research outside of course work	.4069	.9167
Attended research seminars in discipline	.5146	.9159
Attended interdisciplinary research seminars	.4235	.9166
Generated and used research data	.4767	.9161
Attended workshops or seminars on research ethics	.3286	.9174
Attended workshops on research administration	.4003	.9168
Reviewed papers for publication or presentation	.3026	.9178
Formally assessed your colleagues' teaching	.1498	.9193
Formally assessed your own teaching	.2277	.9183
Used the university's teaching development center	.3325	.9175
Observed classes taught by others to learn about teaching	.4583	.9163
Attended departmental social events	.5549	.9155
Attended graduate students associations socials	.2854	.9177
Attended a play, dance, etc... sponsored by institution	.4145	.9167
Attended sporting event sponsored by institutions	.4276	.9165
Attended a concert or other music event sponsored by institution	.2188	.9182
Participated in intramural athletics	-.0559	.9198
Participated in campus clubs, student organizations, or government	.0841	.9195
Participated in activities to enhance your spirituality	-.0217	.9211
Attended trips to other campuses to learn about other institutions/departments	.2016	.9184
Attended workshops on career development/opportunities	.4545	.9164
Attended workshops or seminars on roles and responsibilities of a professor	.4363	.9165
Attended workshops on research administration	.4742	.9164
Attended workshops or seminars on student development	.4924	.9161
Attended workshops on the mission and purpose of higher education	.3395	.9173
Served on committees to help craft policies, work on accreditation, engage in governance	.2520	.9179
Attended professional conferences or meeting	.5666	.9154
Participated in consulting projects not associated with your department or institutions	.1493	.9190
Participated in an outreach or extension project	.3122	.9176
Worked in a team on research	.4210	.9166
Worked in a team on teaching	.3129	.9176
Worked collaboratively on writing for publication	.5132	.9157
Met outside of class with other students on campus for a meeting, discussion, or study group	.4990	.9160
Met with fellow students to talk about current events	.3806	.9169
Met with fellow students to talk about your research	.5690	.9154
Met with fellow students to talk about teaching	.5966	.9151
Met with students to talk about faculty advisors	.3882	.9169
Met with student to talk about course work, plans of work, and faculty	.4559	.9164
Attended departmental social events with other fellow students	.6879	.9145
Attended informal dinners and get-together with other fellow students	.6160	.9150
Interacted with students whose race or ethnic background is different from yours	.5343	.9158
Interacted with students whose philosophy of life or personal values are different than yours	.5245	.9158
Interacted with students whose family background are different than yours	.4547	.9163

Table 4.7 Continued		
Your advisor's research	.4877	.9160
Course work	.3700	.9170
Professional organizations	.4912	.9162
Current events in your discipline	.5188	.9158
Your progress in the program	.5786	.9153
Professional relationships with others in your discipline	.6903	.9142
Applying and writing grants	.4633	.9162
Your personal life	.4217	.9166
Institutional events	.5001	.9161
Departmental events	.5348	.9158

Table 4.8: Variables with Corrected Item-Total Correlation less than .3000

Items	58 Item Scale	Individual Factor
Used the library regularly for research/papers etc...	.0235	.0358
Used computer facilities on campus for research etc...	.1177	.2313
Request the library to subscribe to journal	.1494	.1701
Attended graduate students associations socials	.2854	.3165
Formally assessed your colleagues' teaching	.1498	.1599
Formally assessed your own teaching	.2277	.2734
Attended a concert or other music event sponsored by institution	.2188	.2628
Participated in intramural athletics	-.0559	-.0558
Participated in campus clubs, student organizations, or government	.0841	-.1433
Participated in activities to enhance your spirituality	-.0217	-.0367
Attended trips to other campuses to learn about other institutions/departments	.2016	.3208
Served on committees to help craft policies, work on accreditation, engage in governance	.2520	.3181
Participated in consulting projects not associated with your department or institutions	.1493	.1884

The last criteria that was used in the data reduction process was to look at the items goodness of fit with respect to the factor it loaded on. There were eleven items that the researcher concluded did not load on the appropriate factor. The eleven items that did not fit in the respective factors are presented in Table 4.9.

Table 4.9: Variables that Did Not have a Good Fit with their Respective Factor

Items	Factor Loading
Observed classes taught by others to learn about teaching	Peer and Social Involvement
Request the computing service to purchase software	Peer and Social Involvement
Used computer facilities on campus for research etc...	Peer and Social Involvement
Formally assessed your colleagues' teaching	Peer and Social Involvement
Participated in campus clubs, student organizations, or government	Faculty Involvement
Request the library to subscribe to journal	Faculty Involvement
Participated in activities to enhance your spirituality	Faculty Involvement
Participated in intramural athletics	Faculty Involvement
Attended sporting event sponsored by institutions	Research Involvement
Attended trips to other campuses to learn about other institutions/departments	Research Involvement
Worked in a team on teaching	Research Involvement
Participated in consulting projects not associated with your department or institutions	Research Involvement

Based on the three criteria, the 15 variables were dropped from the DSIQ Scale. In addition the variable “Attended workshops on research administration” was dropped from the scale because it was duplicated in the original 58 item scale. The 16 variables dropped are presented in Table 4.10.

Table 4.10: DSIQ Variable Reduction Justification

Item Name	Corrected Item-Total Correlation (DSIQ Scale)	Corrected Item-Total Correction (Factor)	Factor Score	Goodness of Fit
Used computer facilities on campus for research etc...	0.1177	0.2312	0.264	N
Request the library to subscribe to journal	0.1494	0.1701	0.211	N
Used the library regularly for research/papers etc...	0.0235	0.0358	0.192	Y
Request the computing service to purchase software	0.3786	0.3024	0.284	N
Served on committees to help craft policies, work on accreditation, engage in governance	0.2521	0.2520	0.329	Y
Attended trips to other campuses to learn about other institutions/departments	0.2016	0.2016	0.372	N
Participated in consulting projects not associated with your department or institutions	0.1493	0.1493	0.327	N
Attended a concert or other music event sponsored by institution	0.2188	0.2188	0.239	Y
Participated in intramural athletics	0.0559	-0.0559	-0.097	N
Participated in campus clubs, student organizations, or government	0.0841	0.0841	-0.338	N
Participated in activities to enhance your spirituality	0.0217	-0.0217	-0.147	N
Formally assessed your colleagues' teaching	0.1498	0.1498	0.157	N
Formally assessed your own teaching	0.2277	0.2277	0.331	Y
Attended graduate students associations socials	0.2854	0.2277	0.375	Y
Worked in a team on research	0.3129	0.3246	0.338	N
Attended workshops on research administration (duplicate)	0.5728	0.4742	0.642	Y

Factor Analysis

The 42 item scale was subjected to principle component analysis with Varimax rotation. The analysis produced a Kaiser-Meyer-Olkin statistic, correlation matrix, communalities, eigenvalues, and factor loading. The Kaiser-Meyer-Olkin (KMO) was .800, which is an indicator of sampling adequacy. A KMO of .600 or higher indicates the items have a suitable degree of intercorrelation for factor analysis (Garson, 2003).

The correlation matrix coefficients were the same as the initial coefficients because this procedure calculates the correlation between individual variables. The majority of the variables in the correlation matrix had coefficients close to zero with no coefficient above .7800. The matrix and coefficients were used to determine which variable factored together. The correlation matrix of the 43 item scale is presented in Table 4.11. Communalities ranged from .0.207 to 0.752 and are presented in Table 4.12.

The four factor solution accounted for 49.9% of the total variance. The first factors, labeled Peer and Social Involvement, accounted for 27.057% of the common variance with an eigenvalue of 11.634. All of the items in Peer Involvement segment and two of the items in the Social Involvement segment of the questionnaire loaded on this factor. The second factor, labeled Faculty Involvement, accounted for 9.528% of the common variance with an eigenvalue of 4.002. All the items in the Faculty Involvement segment of the questionnaire loaded on this factor.

The third factor, labeled Academic and Professional Involvement, accounted for 7.769% of the common variance with an eigenvalue of 3.263. One item in the

Academic segment, one item in the Professional segment, two items in the Research segment, two items in the Teaching segment, and three items from the Institutional segment of the questionnaire loaded on this factor. The fourth and final factor, labeled Research Involvement, accounted for 5.614% of the common variance with an eigenvalue of 2.358. Five items in the Research segment, three in the Professional segment and one in the Social segment of the questionnaire loaded on this factor. The factors variance and eigenvalues are displayed in Table 4.13. In addition the four factor loadings are presented in Table 4.14.

Table 4.11: Correlation Matrix of the 42 Item DSIQ Scale

	ACASPEAK	RESOUTSI	RESEMINA	RESINTER	RESGENER
ACASPEAK	1.0000				
RESOUTSI	0.2227	1.0000			
RESEMINA	0.2459	0.3132	1.0000		
RESINTER	0.2351	0.2584	0.5059	1.0000	
RESGENER	0.1984	0.4788	0.3675	0.3089	1.0000
RESATTET	0.1777	0.0515	0.2823	0.4406	0.1735
RESADMIN	0.2332	0.1062	0.2419	0.3370	0.2233
RESREVIE	0.2521	0.2172	0.2461	0.2332	0.2718
TEACENTE	0.1823	0.1169	0.2291	0.1687	0.0531
TEACLASS	0.1525	0.0822	0.3632	0.1862	0.1480
SOCDEPAR	0.2980	0.2346	0.2026	0.1602	0.2113
SOCPERFO	0.0313	0.1069	0.2426	0.1684	0.0894
SOCSPORT	0.1484	0.3463	0.3111	0.2179	0.3229
INSTCARE	0.1710	0.2306	0.3087	0.3218	0.1857
INSTPROF	0.2157	0.1562	0.2416	0.1621	0.1830
INSTUDEN	0.2887	0.1424	0.2434	0.3327	0.1727
INSTEDUC	0.2578	0.3096	0.1487	0.1138	0.2544
PROFMEET	0.2923	0.3219	0.4526	0.2538	0.2639
PROFEXTE	0.2832	0.2308	0.1683	0.1811	0.1148
PROFRESE	0.1482	0.4736	0.2138	0.2630	0.5037
PROPUBLI	0.0970	0.5481	0.4519	0.4036	0.4363
PEERSTUD	0.1496	-0.0249	0.1438	0.0382	0.1314
PEEREVEN	-0.0119	0.1259	0.0532	0.0027	0.2054
PEERESEA	0.1355	0.2089	0.3810	0.1570	0.2213
PEERTEAC	0.0766	0.1287	0.3154	0.0439	0.2163
PEERADVI	-0.0074	0.0719	0.1468	-0.0062	0.1909
PEERWORK	-0.0020	0.1041	0.1965	0.0657	0.1920
PEERSOCI	0.2987	0.1915	0.3100	0.2048	0.2354
PEERINFO	0.1873	0.2085	0.2772	0.1875	0.2405
PEERFAMI	0.0845	0.1956	0.1598	0.1172	0.2492
PEERVALU	0.1014	0.1813	0.2770	0.1191	0.2428
PEERETHN	0.0718	-0.0034	0.1670	0.1268	0.1604
FACRESEA	0.1698	0.3620	0.2115	0.1997	0.4334
FACOURSE	-0.0104	0.0983	0.1669	0.1669	0.1699
FACPROFE	0.0965	0.1665	0.2429	0.2038	0.2296
FACDISCI	0.1379	0.3110	0.2022	0.2454	0.2351
FACPROGR	0.2017	0.2882	0.2462	0.1965	0.2766
FACOTHER	0.2338	0.2999	0.3213	0.2222	0.3799
FACGRANT	0.2312	0.2747	0.2088	0.2470	0.3702
FACLIFE	0.0942	0.2033	0.2028	0.1648	0.2504
FACINSTI	0.0289	0.2007	0.2552	0.1863	0.3267
FACDEPAR	0.1831	0.2120	0.2047	0.1725	0.2912

Table 4.11 Continued	RESATTET	RESADMIN	RESREVIE	TEACENTE	TEACLASS
RESATTET	1.0000				
RESADMIN	0.6175	1.0000			
RESREVIE	0.1690	0.3333	1.0000		
TEACENTE	0.2537	0.3236	0.1319	1.0000	
TEACLASS	0.3081	0.2165	0.1316	0.4502	1.0000
SOCDEPAR	0.1819	0.1653	0.1717	0.3302	0.3355
SOCPERFO	-0.0231	-0.1027	-0.0149	0.1349	0.2539
SOCSPORT	0.0175	0.0105	0.0496	0.0354	0.1209
INSTCARE	0.3301	0.2468	0.1598	0.2037	0.1782
INSTPROF	0.2868	0.3126	0.1350	0.3798	0.3049
INSTUDEN	0.4839	0.4464	0.0624	0.2353	0.2972
INSTEDUC	0.3403	0.2650	0.0319	0.0115	0.1536
PROFMEET	0.1828	0.1780	0.3610	0.3232	0.4329
PROFEXTE	0.3205	0.2401	-0.1012	0.1889	0.1911
PROFRESE	0.0272	0.0397	0.2457	-0.0198	0.1025
PROPUBLI	0.1648	0.1885	0.3643	0.2232	0.3163
PEERSTUD	0.1134	0.0638	0.0885	0.1776	0.3121
PEEREVEN	-0.0349	0.1049	-0.0973	0.0486	0.1542
PEERESEA	0.0930	0.1419	0.0516	0.1479	0.3638
PEERTEAC	0.1961	0.2396	0.0977	0.3042	0.4837
PEERADVI	-0.0093	0.1451	0.1013	0.1510	0.1745
PEERWORK	-0.0286	0.1719	0.1887	0.1513	0.2341
PEERSOCI	0.2438	0.2402	0.1578	0.3553	0.4043
PEERINFO	0.1340	0.1748	0.1630	0.1946	0.3502
PEERFAMI	0.0244	0.1204	0.0777	0.2203	0.2779
PEERVALU	0.0242	0.0447	0.1574	0.1748	0.2471
PEERETHN	0.0999	-0.0190	0.0297	0.1467	0.4055
FACRESEA	0.0859	0.2227	0.1385	-0.0424	0.0922
FACOURSE	0.0778	0.1238	-0.0268	-0.0242	0.1103
FACPROFE	0.1933	0.1563	0.0971	0.0927	0.1726
FACDISCI	0.1552	0.2256	0.0866	0.0758	0.1332
FACPROGR	0.0695	0.1876	0.1474	0.1464	0.2180
FACOTHER	0.1185	0.2433	0.2363	0.1217	0.2452
FACGRANT	0.0143	0.1747	0.2511	0.0026	0.0169
FACLIFE	0.0746	0.1359	0.2118	-0.0202	0.0547
FACINSTI	0.0640	0.0984	0.1339	0.0180	0.0886
FACDEPAR	0.1073	0.1752	0.2726	0.0394	0.1269

Table 4.11 Continued					
	SOCDEPAR	SOCPERFO	SOCSPORT	INSTCARE	INSTPROF
SOCDEPAR	1.0000				
SOCPERFO	0.2276	1.0000			
SOCSPORT	0.2537	0.3671	1.0000		
INSTCARE	0.1768	0.2327	0.1525	1.0000	
INSTPROF	0.2844	0.1278	0.1775	0.4864	1.0000
INSTUDEN	0.2633	0.2457	0.1404	0.4069	0.4609
INSTEDUC	0.1591	0.1909	0.1383	0.4438	0.4630
PROFMEET	0.4139	0.2359	0.3244	0.2529	0.2288
PROFEXTE	0.2273	0.1878	0.1682	0.1256	0.2202
PROFRESE	0.2022	0.1595	0.2806	0.2038	0.1529
PROPUBLI	0.2477	0.1678	0.3845	0.2977	0.1951
PEERSTUD	0.3802	0.3679	0.2552	0.1191	0.2356
PEEREVEN	0.1607	0.1812	0.1421	0.0635	0.1083
PEERESEA	0.3179	0.3520	0.1382	0.1818	0.2249
PEERTEAC	0.3229	0.3419	0.1863	0.1888	0.3259
PEERADVI	0.2075	0.1850	0.0548	-0.0545	0.1111
PEERWORK	0.2491	0.1692	0.1326	0.1441	0.1421
PEERSOCI	0.7950	0.2438	0.2766	0.2388	0.3147
PEERINFO	0.5105	0.2634	0.3031	0.1693	0.2380
PEERFAMI	0.5066	0.3054	0.3035	0.0789	0.2563
PEERVALU	0.4546	0.2635	0.3590	0.0937	0.1673
PEERETHN	0.3962	0.3422	0.3452	0.0541	0.1833
FACRESEA	0.2597	0.1942	0.1444	0.3138	0.0629
FACOURSE	0.1496	0.0457	0.1382	0.2744	0.1357
FACPROFE	0.1328	0.1801	0.1830	0.4654	0.3030
FACDISCI	0.2155	0.1675	0.0936	0.3807	0.2463
FACPROGR	0.2726	0.1993	0.1562	0.3693	0.2586
FACOTHER	0.3270	0.3922	0.2239	0.4098	0.2389
FACGRANT	0.2021	0.1519	0.1423	0.3054	0.1576
FACLIFE	0.1546	0.2356	0.1681	0.3290	0.1782
FACINSTI	0.2127	0.1963	0.1838	0.3411	0.2431
FACDEPAR	0.3482	0.2016	0.1920	0.2344	0.2343

Table 4.11 Continued	INSTUDEN	INSTEDUC	PROFMEET	PROFEXTE	PROFRESE
INSTUDEN	1.0000				
INSTEDUC	0.5454	1.0000			
PROFMEET	0.1990	0.1575	1.0000		
PROFEXTE	0.3238	0.3945	0.1805	1.0000	
PROFRESE	0.1063	0.1162	0.4138	0.1645	1.0000
PROPUBLI	0.1770	0.0784	0.4243	0.0152	0.5632
PEERSTUD	0.1929	0.1200	0.3786	0.1205	0.1879
PEEREVEN	-0.0132	0.0177	0.2120	0.0874	0.1674
PEERESEA	0.2008	0.0971	0.3751	0.1568	0.2239
PEERTEAC	0.3072	0.1323	0.4441	0.2412	0.2185
PEERADVI	0.0922	-0.0046	0.2187	0.0856	0.1523
PEERWORK	0.1754	-0.0195	0.2713	-0.0387	0.2024
PEERSOCI	0.3252	0.2047	0.4424	0.2499	0.1826
PEERINFO	0.1251	0.0709	0.3601	0.1997	0.2128
PEERFAMI	0.0643	0.1225	0.2963	0.1835	0.2529
PEERVALU	0.0684	0.0467	0.3187	0.0790	0.2189
PEERETHN	0.0784	0.0567	0.2890	0.0577	0.1614
FACRESEA	0.2585	0.2290	0.2635	0.0569	0.4543
FACOURSE	0.1536	0.1340	-0.0094	-0.0340	0.0516
FACPROFE	0.4015	0.2508	0.2369	0.0654	0.1943
FACDISCI	0.3418	0.2637	0.2318	0.1293	0.2650
FACPROGR	0.3143	0.1779	0.2733	0.0921	0.2352
FACOTHER	0.3523	0.2578	0.3398	0.1683	0.2858
FACGRANT	0.1892	0.2372	0.1071	0.1616	0.2018
FACLIFE	0.1603	0.0577	0.1202	0.0352	0.2115
FACINSTI	0.2288	0.1720	0.1539	-0.0292	0.2536
FACDEPAR	0.2106	0.1758	0.2152	0.0520	0.3002

Table 4.11 Continued

	PROPUBLI	PEERSTUD	PEEREVEN	PEERESEA	PEERTEAC
PROPUBLI	1.0000				
PEERSTUD	0.1073	1.0000			
PEEREVEN	0.0859	0.4273	1.0000		
PEERESEA	0.2320	0.4039	0.5841	1.0000	
PEERTEAC	0.1605	0.5196	0.5214	0.7665	1.0000
PEERADVI	0.0789	0.3376	0.5201	0.6101	0.6025
PEERWORK	0.2334	0.3990	0.5065	0.5365	0.5766
PEERSOCI	0.2425	0.4429	0.3078	0.4822	0.4815
PEERINFO	0.2240	0.4687	0.4822	0.4803	0.5095
PEERFAMI	0.2489	0.4947	0.4637	0.4066	0.4378
PEERVALU	0.2529	0.4571	0.3383	0.3483	0.3996
PEERETHN	0.1881	0.4835	0.5023	0.3775	0.3525
FACRESEA	0.3768	0.1817	0.1567	0.2211	0.1682
FACOURSE	0.2227	0.1323	0.1447	0.3006	0.1508
FACPROFE	0.2666	0.3205	0.1667	0.2462	0.2599
FACDISCI	0.2940	0.2213	0.2765	0.3426	0.2893
FACPROGR	0.2631	0.2371	0.3085	0.4213	0.2974
FACOTHER	0.3454	0.3695	0.2995	0.4716	0.3960
FACGRANT	0.2856	0.0932	0.1747	0.3308	0.2009
FACLIFE	0.2347	0.2203	0.2238	0.2838	0.2791
FACINSTI	0.3121	0.2377	0.1664	0.2237	0.1781
FACDEPAR	0.3089	0.3396	0.1929	0.3139	0.2806

	PEERADVI	PEERWORK	PEERSOCI	PEERINFO	PEERFAMI
PEERADVI	1.0000				
PEERWORK	0.7034	1.0000			
PEERSOCI	0.3520	0.3897	1.0000		
PEERINFO	0.4014	0.4891	0.6794	1.0000	
PEERFAMI	0.3618	0.4302	0.5884	0.5517	1.0000
PEERVALU	0.3125	0.4199	0.5772	0.5438	0.8299
PEERETHN	0.2434	0.2869	0.4972	0.4680	0.6727
FACRESEA	0.0781	0.1468	0.2515	0.1707	0.1458
FACOURSE	0.2155	0.2471	0.2887	0.1829	0.1059
FACPROFE	0.0438	0.1895	0.2360	0.1775	0.0617
FACDISCI	0.0611	0.2016	0.2912	0.2515	0.1385
FACPROGR	0.2370	0.2368	0.4217	0.3683	0.1860
FACOTHER	0.2806	0.3006	0.4577	0.3526	0.3485
FACGRANT	0.1472	0.1803	0.2672	0.2322	0.1710
FACLIFE	0.1854	0.2920	0.1735	0.2252	0.1258
FACINSTI	0.1971	0.2489	0.3058	0.2413	0.2062
FACDEPAR	0.2282	0.2031	0.3794	0.2542	0.3177

Table 4.11 Continued

	PEERVALU	PEERETHN	FACRESEA	FACOURSE	FACPROFE
PEERVALU	1.0000				
PEERETHN	0.6380	1.0000			
FACRESEA	0.1631	0.0706	1.0000		
FACOURSE	0.1363	0.1143	0.4173	1.0000	
FACPROFE	0.1337	0.1958	0.4625	0.5323	1.0000
FACDISCI	0.1805	0.1254	0.5637	0.5899	0.6861
FACPROGR	0.2730	0.1933	0.5321	0.4968	0.4237
FACOTHER	0.3541	0.3078	0.5438	0.5102	0.6143
FACGRANT	0.1838	0.1451	0.4119	0.4220	0.4306
FACLIFE	0.1517	0.0925	0.4259	0.4663	0.4139
FACINSTI	0.2798	0.1384	0.5447	0.6295	0.5063
FACDEPAR	0.3168	0.2390	0.5170	0.5313	0.3742

	FACDISCI	FACPROGR	FACOTHER	FACGRANT	FACLIFE
FACDISCI	1.0000				
FACPROGR	0.5534	1.0000			
FACOTHER	0.6878	0.6542	1.0000		
FACGRANT	0.5820	0.4522	0.6591	1.0000	
FACLIFE	0.4958	0.5267	0.5063	0.3758	1.0000
FACINSTI	0.5735	0.4987	0.6398	0.5220	0.5211
FACDEPAR	0.5077	0.5060	0.6949	0.4654	0.5124

	FACINSTI	FACDEPAR			
FACINSTI	1.0000				
FACDEPAR	0.7716	1.0000			

Table 4.12: Communality of the 42 Item DSIQ Scale

	Initial	Extraction
Assist in bring speakers to campus	1.000	.254
Conducted research outside of course work	1.000	.519
Attended research seminars in discipline	1.000	.413
Attended interdisciplinary research seminars	1.000	.395
Generated and used research data	1.000	.477
Attended workshops or seminars on research ethics	1.000	.561
Attended workshops on research administration	1.000	.433
Reviewed papers for publication or presentation	1.000	.253
Used the university's teaching development center	1.000	.360
Observed classes taught by others to learn about teaching	1.000	.423
Attended departmental social events	1.000	.436
Attended a play, dance, etc... sponsored by institution	1.000	.207
Attended sporting event sponsored by institutions	1.000	.337
Attended workshops on career development/opportunities	1.000	.455
Attended workshops or seminars on roles and responsibilities of a professor	1.000	.430
Attended workshops or seminars on student development	1.000	.616
Attended workshops on the mission and purpose of higher education	1.000	.394
Attended professional conferences or meeting	1.000	.504
Participated in an outreach or extension project	1.000	.276
Worked in a team on research	1.000	.532
Worked collaboratively on writing for publication	1.000	.624
Met outside of class with other students on campus for a meeting, discussion, or study group	1.000	.484
Met with fellow students to talk about current events	1.000	.514
Met with fellow students to talk about your research	1.000	.577
Met with fellow students to talk about teaching	1.000	.647
Met with students to talk about faculty advisors	1.000	.471
Met with student to talk about course work, plans of work, and faculty	1.000	.487
Attended departmental social events with other fellow students	1.000	.631
Attended informal dinners and get-together with other fellow students	1.000	.576
Interacted with students whose race or ethnic background is different from yours	1.000	.644
Interacted with students whose philosophy of life or personal values are different than yours	1.000	.589
Interacted with students whose family background are different than yours	1.000	.513
Your advisor's research	1.000	.568
Course work	1.000	.597
Professional organizations	1.000	.559
Current events in your discipline	1.000	.688
Your progress in the program	1.000	.551
Professional relationships with others in your discipline	1.000	.753
Applying and writing grants	1.000	.495
Your personal life	1.000	.485
Institutional events	1.000	.675
Departmental events	1.000	.585

Table 4.13: Total Variance Explained and Eigenvalues of the 42 Item DSIQ Scale

Total Variance Explained						
	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.364	27.057	27.057	11.364	27.057	27.057
2	4.002	9.528	36.585	4.002	9.528	36.585
3	3.263	7.769	44.354	3.263	7.769	44.354
4	2.358	5.614	49.969	2.358	5.614	49.969
5	1.785	4.251	54.219			
6	1.555	3.701	57.921			
7	1.412	3.363	61.283			
8	1.183	2.817	64.101			
9	1.107	2.636	66.736			
10	1.020	2.428	69.164			
11	.966	2.299	71.463			
12	.880	2.096	73.559			
13	.804	1.914	75.474			
14	.762	1.813	77.287			
15	.729	1.736	79.023			
16	.685	1.630	80.653			
17	.645	1.536	82.189			
18	.631	1.502	83.691			
19	.570	1.358	85.049			
20	.549	1.308	86.357			
21	.521	1.241	87.598			
22	.471	1.122	88.720			
23	.470	1.119	89.839			
24	.443	1.054	90.893			
25	.419	.997	91.890			
26	.371	.884	92.774			
27	.360	.857	93.631			
28	.324	.773	94.404			
29	.319	.759	95.163			
30	.262	.624	95.787			
31	.257	.612	96.399			
32	.218	.520	96.919			
33	.198	.472	97.390			
34	.190	.452	97.842			

Table 4.13 Continued						
35	.161	.383	98.225			
36	.153	.365	98.590			
37	.133	.317	98.907			
38	.121	.289	99.196			
39	.105	.249	99.445			
40	9.234E-	.220	99.665			
41	7.245E-	.172	99.837			
42	6.846E-	.163	100.000			

Table 4.14: Rotated Factor Loading of 42 Item DSIQ Scale

	1	2	3	4
Interacted with students whose race or ethnic background is different from yours	**.764**	1.167E-02	2.142E-02	.245
Met with fellow students to talk about teaching	**.735**	.171	.278	-.011
Attended informal dinners and get-together with other fellow students	**.708**	.118	.143	.200
Interacted with students whose philosophy of life or personal values are different than yours	**.704**	6.326E-02	-.031	.297
Interacted with students whose family background are different than yours	**.702**	1.078E-02	2.534E-02	.139
Met with fellow students to talk about your research	**.686**	.292	.134	4.707E-02
Met with fellow students to talk about current events	**.677**	.204	-.101	-.057
Attended departmental social events with other fellow students	**.667**	.164	.345	.198
Met with students to talk about faculty advisors	**.666**	.141	-.037	-.072
Met with student to talk about course work, plans of work, and faculty	**.666**	.206	-.022	2.988E-02
Met outside of class with other students on campus for a meeting, discussion, or study group	**.665**	.156	.130	1.153E-02
Attended departmental social events	**.518**	6.637E-02	.294	.277
Attended a play, dance, etc... sponsored by institution	**.391**	.153	.104	.143
Current events in your discipline	.115	**.790**	.200	.107
Institutional events	.151	**.789**	2.328E-03	.172
Course work	.121	**.760**	2.077E-02	-.056
Professional relationships with others in your discipline	.336	**.747**	.182	.221
Professional organizations	9.066E-02	**.691**	.263	5.673E-02
Departmental events	.251	**.688**	4.014E-02	.217
Your personal life	.153	**.668**	6.978E-03	.122
Your progress in the program	.264	**.659**	.156	.149
Applying and writing grants	9.555E-02	**.654**	7.618E-02	.229
Your advisor's research	4.136E-02	**.654**	4.797E-02	.370

Table 4.14 Continued				
Attended workshops or seminars on research ethics	-.022	2.014E-02	**.746**	6.165E-02
Attended workshops or seminars on student development	6.234E-02	.273	**.733**	1.255E-02
Attended workshops on research administration	3.488E-02	.130	**.639**	8.007E-02
Attended workshops or seminars on roles and responsibilities of a professor	.199	.170	**.599**	5.600E-02
Attended workshops on the mission and purpose of higher education	-.038	.227	**.578**	8.472E-02
Used the university's teaching development center	.278	-.139	**.507**	7.952E-02
Participated in an outreach or extension project	.128	-.037	**.500**	9.210E-02
Attended workshops on career development/opportunities	-.009	.420	**.499**	.171
Observed classes taught by others to learn about teaching	.437	-.048	**.460**	.133
Assist in bring speakers to campus	4.303E-02	3.674E-02	**.404**	.296
Worked collaboratively on writing for publication	.116	.213	.104	**.745**
Conducted research outside of course work	2.220E-02	.192	9.220E-02	**.688**
Worked in a team on research	.145	.194	-.047	**.686**
Generated and used research data	.125	.266	8.680E-02	**.619**
Attended sporting event sponsored by institutions	.270	5.188E-02	2.697E-02	**.511**
Attended professional conferences or meeting	.400	1.047E-02	.289	**.510**
Attended research seminars in discipline	.190	.121	.347	**.492**
Reviewed papers for publication or presentation	2.097E-02	7.689E-02	.143	**.476**
Attended interdisciplinary research seminars	-.027	.134	.398	**.466**

Reliability of the DSIQ

Reliability analysis was conducted on the DSIQ and each of its four factors. The alpha for the 42 item DSIQ was 0.9289. The corrected item-total correlation ranged from 0.2789 to 0.7285. None of the items would have increased the overall alpha if deleted. The items mean was 2.30 and ranged from 1.43 to 3.24. The item-total correlation and alpha if item deleted for the 42 item DSIQ scale are presented in Table 4.15.

Table 4.15: Corrected Item-Total Correlation and Alpha if Deleted of 42 Item DSIQ Scale

Items	Corrected Item-Total Correlation	Alpha if Deleted
Assist in bring speakers to campus	0.3180	0.9284
Conducted research outside of course work	0.4233	0.9278
Attended research seminars in discipline	0.5081	0.9269
Attended interdisciplinary research seminars	0.3983	0.9280
Generated and used research data	0.4946	0.9270
Attended workshops or seminars on research ethics	0.3162	0.9286
Attended workshops on research administration	0.3753	0.9281
Reviewed papers for publication or presentation	0.2869	0.9293
Used the university's teaching development center	0.3092	0.9290
Observed classes taught by others to learn about teaching	0.4507	0.9276
Attended departmental social events	0.5440	0.9266
Attended a play, dance, etc... sponsored by institution	0.3839	0.9280
Attended sporting event sponsored by institutions	0.3851	0.9282
Attended workshops on career development/opportunities	0.4667	0.9273
Attended workshops or seminars on roles and responsibilities of a professor	0.4522	0.9274
Attended workshops or seminars on student development	0.4646	0.9273
Attended workshops on the mission and purpose of higher education	0.3487	0.9282
Attended professional conferences or meeting	0.5584	0.9265
Participated in an outreach or extension project	0.2789	0.9293
Worked in a team on research	0.4372	0.9276
Worked collaboratively on writing for publication	0.5237	0.9267
Met outside of class with other students on campus for a meeting, discussion, or study group	0.4964	0.9270
Met with fellow students to talk about current events	0.4039	0.9279
Met with fellow students to talk about your research	0.6034	0.9261

Table 4.15 Continued		
Met with fellow students to talk about teaching	0.6092	0.9259
Met with students to talk about faculty advisors	0.3910	0.9280
Met with student to talk about course work, plans of work, and faculty	0.4754	0.9272
Attended departmental social events with other fellow students	0.6760	0.9255
Attended informal dinners and get-together with other fellow students	0.5937	0.9261
Interacted with students whose race or ethnic background is different from yours	0.5398	0.9267
Interacted with students whose philosophy of life or personal values are different than yours	0.5244	0.9268
Interacted with students whose family background are different than yours	0.4530	0.9274
Your advisor's research	0.5041	0.9270
Course work	0.4096	0.9278
Professional organizations	0.5137	0.9270
Current events in your discipline	0.5733	0.9263
Your progress in the program	0.5935	0.9261
Professional relationships with others in your discipline	0.7285	0.9247
Applying and writing grants	0.4914	0.9271
Your personal life	0.4616	0.9273
Institutional events	0.5366	0.9268
Departmental events	0.5815	0.9263

Factor 1: Peer and Social Involvement

The alpha for the first factor, Peer and Social Involvement was 0.9076. The item-total correlation ranged from 0.2789 to 0.7285. The items' mean was 2.57 and ranged from 2.01 to 3.02. Only one item, "Met with fellow students to talk about teaching", would have improved the alpha if it had been deleted from this factor. The item-total correlation and alpha if item deleted from the Peer and Social Involvement Factor are presented in Table 4.16.

Table 4.16: Corrected Item-Total Correlation and Alpha if Deleted of Peer and Social Involvement Factor

Items	Corrected Item-Total Correlation	Alpha if Deleted	Item Mean
Interacted with students whose race or ethnic background is different from yours	0.5337	0.9070	2.7739
Met with fellow students to talk about teaching	0.3788	0.9123	2.0174
Attended informal dinners and get-together with other fellow students	0.6209	0.9033	2.8957
Interacted with students whose philosophy of life or personal values are different than yours	0.5992	0.9043	2.3913
Interacted with students whose family background are different than yours	0.6875	0.9005	2.3739
Met with fellow students to talk about your research	0.7060	0.8995	2.1043
Met with fellow students to talk about current events	0.5797	0.9050	2.2870
Attended departmental social events with other fellow students	0.6208	0.9033	2.6087
Met with students to talk about faculty advisors	0.7064	0.8998	2.6609
Met with student to talk about course work, plans of work, and faculty	0.7075	0.8995	2.6696
Met outside of class with other students on campus for a meeting, discussion, or study gr	0.7328	0.8988	3.0261
Attended departmental social events	0.6695	0.9013	2.7913
Attended a play, dance, etc... sponsored by institution	0.6284	0.9029	2.8522

Factor 2: Faculty Involvement

The alpha for the second factor, Faculty Involvement, was 0.9161. The item-total correlation ranged from 0.6260 to 0.8174. The items' mean was 2.07 and ranged from 1.73 to 2.60. None of the items would have increased the overall alpha if deleted. The corrected item-total correlation and alpha if item deleted from the Faculty Involvement Factor are presented in Table 4.17.

Table 4.17: Corrected Item-Total Correlation and Alpha if Deleted of Faculty Involvement Factor

Items	Corrected Item-Total Correlation	Alpha if Deleted	Item Mean
Current events in your discipline	0.6400	0.9118	2.3478
Institutional events	0.6621	0.9093	2.3217
Course work	0.6447	0.9101	1.7391
Professional relationships with others in your discipline	0.7724	0.9027	2.0435
Professional organizations	0.6804	0.9080	2.6087
Departmental events	0.8174	0.8995	1.9913
Your personal life	0.6260	0.9114	1.8435
Your progress in the program	0.6106	0.9121	1.9913
Applying and writing grants	0.7639	0.9041	1.7913
Your advisor's research	0.7133	0.9063	2.0696

Factor 3: Academic and Professional Involvement

The alpha for the third factor, Academic and Professional Involvement, was 0.8095. The corrected item-total correlation ranged from 0.3462 to 0.6354. The items' mean was 1.80 and ranged from 1.43 to 2.50. None of the items would have increased the overall alpha if deleted. The item-total correlation and alpha if item deleted from the Academic and Professional Involvement Factor are presented in Table 4.18.

Table 4.18: Corrected Item-Total Correlation and Alpha if Deleted of Academic and Professional Involvement Factor

Items	Corrected Item-Total Correlation	Alpha if Deleted	Item Mean
Attended workshops or seminars on research ethics	0.3462	0.7983	1.5304
Attended workshops or seminars on student development	0.5742	0.7744	1.9652
Attended workshops on research administration	0.5275	0.7796	1.8348
Attended workshops or seminars on roles and responsibilities of a professor	0.4195	0.7938	1.7391
Attended workshops on the mission and purpose of higher education	0.4165	0.7957	2.5043
Used the university's teaching development center	0.4566	0.7877	1.8696
Participated in an outreach or extension project	0.5708	0.7740	1.7913
Attended workshops on career development/opportunities	0.6354	0.7680	1.5391
Observed classes taught by others to learn about teaching	0.5079	0.7838	1.4348
Assist in bring speakers to campus	0.3969	0.7961	1.8435

Factor 4: Research Involvement

The alpha for the fourth factor, Research Involvement, was 0.8223. The corrected item-total correlation ranged from 0.3664 to 0.7080. The items' mean was 2.71 and ranged from 2.21 to 3.24. Only one item, "Attended sporting event sponsored by institutions", would have improved the alpha if it had been deleted from this factor. The corrected item-total correlation and alpha if item deleted from the Academic and Professional Involvement Factor are presented in Table 4.19.

Table 4.19: Corrected Item-Total Correlation and Alpha if Deleted of Research Involvement Factor

Items	Corrected Item-Total Correlation	Alpha if Deleted	Item Mean
Worked collaboratively on writing for publication	0.5714	0.7985	2.8609
Conducted research outside of course work	0.5482	0.8025	3.2435
Worked in a team on research	0.4578	0.8123	2.5043
Generated and used research data	0.5719	0.7989	3.0087
Attended sporting event sponsored by institutions	0.3669	0.8248	2.2609
Attended professional conferences or meeting	0.4153	0.8176	2.2174
Attended research seminars in discipline	0.5395	0.8031	3.1826
Reviewed papers for publication or presentation	0.5730	0.7985	2.6870
Attended interdisciplinary research seminars	0.7080	0.7809	2.3826

Results Summary

The main purpose of this study was to add to the body of knowledge of involvement and doctoral education. A scale was developed based on student development literature, doctoral student literature and previous involvement scales and questionnaires to measure the level of involvement of leisure studies doctoral students. The 58 item involvement scale was completed first by 16 leisure students in the Spring of 2004 and then re-administered in the Summer of 2004. The revised DSIQ was then completed by 115 leisure doctoral students in the Summer of 2004.

Based on the results of the analysis the original 58 item scale was reduced to 42 items. The items dropped had either a low corrected item-total correlation, low factor score, and or did not fit well within the factor it loaded on. The alpha for the doctoral involvement scale was 0.9286 with a mean score of 2.30. It was also determined that a four factor solution (1-Peer and Social Involvement, 2-Faculty Involvement, 3-Academic and Professional Involvement, & 4-Research Involvement) produced the most interpretable factor structure. The alpha's for each factor ranged from 0.9161 to 0.8223 and means ranging from 1.80 to 2.70.

Chapter 5

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Chapter 5 reviews and discusses the study's purpose and the significance of the study's findings. In addition the study's limitations and recommendation for future research are addressed. This section consists of eight sections: (1) Purpose Revisited, (2) Limitations, (3) Leisure Studies Doctoral Student Profile, (4) Reliability and Validity of the DSIQ, (5) Latent Structure of Doctoral Involvement, (6) Levels of Doctoral Involvement, (7) Implication of the DSIQ, and (8) Recommendations for Future Studies.

Purpose Revisited

The foundation and theory of student involvement was developed by Alexander Astin based on his longitudinal studies of persistence and his personal belief that the more a student is involved both socially and academically, the more they will learn and develop. Because of his research and the work of many other scholars such as Tinto, Kuh, and Pace, many programs, policies, and procedures have been implemented which encourage and facilitate academic and social involvement of undergraduate students.

The main goal of this study was to expand the knowledge of involvement as related to doctoral education. A more lasting goal is for doctoral programs to improve their policies and practices to include activities that will result in better prepared doctoral graduates who can improve the quality of scholarship. Much has been

written about the high attrition rate and lack of preparedness of doctoral students (Bowen & Rudenstine, 1992). The goal of this research was to develop a tool to help faculty members and administrators determine patterns of engagement of doctoral students, which could both assist in reducing the rate of attrition and better prepare and support doctoral students. Much work is yet to be done, but this study may provide initial insight into the both the type and level of involvement of leisure studies doctoral students. The purpose of the research was to lay a foundation for additional research that would lead to significant and positive change in the doctoral education process.

Limitations

The number of respondents (n=115) for factor analysis was small for factor analysis (Garson, 2003). However, the number of doctoral students in leisure studies is relatively small compared to other disciplines and the study had a response rate 53.7%. When the study is replicated it is important to have a larger N. In addition, because only leisure studies doctoral students were surveyed, the findings are not generalizable to other disciplines.

Another limitation was that data were collected only once. A longitudinal study that collects data at different stages of the doctoral degree and different times of the year should be conducted. Another limitation was the subjectivity of factor analysis (Garson, 2003). The determination of number of factors and elimination of items was guided by data, but ultimately the researcher made an informed but subjective decision.

Leisure Studies Doctoral Student Profile

An objective of the study was to profile current leisure studies doctoral students. A profile provided a better understanding of the currently enrolled student in the discipline. The finding showed an even split between male (47.0%) and female (53.0%) students, which is somewhat of a surprise, since in recent surveys the majority of doctoral students in both overall doctoral programs and in leisure studies programs were male. This could be an encouraging sign for a profession that has been struggling with gender im-balance. In addition, the majority of respondents were White, not of Hispanic origin (64.3%), which is similar to other recent leisure studies doctoral studies. The mean age of respondents was 34 with a range of 25-55. The majority of respondents were married (56.5%), had no dependents or children in the home (79.1%), were full-time students (83.5%), had a previous degree in leisure studies (67.0%), and stated they would pursue their doctoral education if they had the chance to do things over again (70.4%).

The large majority of respondents stated their primary career path was to be a professor at a college or university (87.0%) with the next highest response to be a researcher in a public, non-profit or government agency (27.8%), and third as an independent researcher, consultant, or writer. These results indicate that leisure study doctoral programs' primary focus should be preparing future university professors and researchers. However, one-fifth of the respondents also indicated they would be interested in going into administration at a university.

One interesting finding with respect to preparing future university professors was that only 15.7% of respondents indicated that their faculty members emphasize participating in programs such as “Preparing Future Faculty”. In addition, most faculty members did not encourage their students to attend workshops or seminars on methods to improve teaching (44.3%), student development (67.8%), and roles of professors (70.4%). In addition only 41.7% of faculty advisors encourage their students to develop a teaching portfolio.

However, the majority of faculty members did emphasize the need to conduct and present research. Eighty percent of all faculty members emphasize attending research presentations and 82.6% emphasize attending regional and national conferences. In addition, most faculty members encourage leisure studies doctoral students to develop a research portfolio (65.2%).

It appeared that most faculty members emphasize doctoral students’ research development more than other aspects of their development, such as the many roles a professor plays, including teaching, and understanding a student’s development. A reason for this difference could be that faculty members perceive that their main objective as a faculty advisor/mentor is research. Faculty members may perceive that other aspects of a leisure studies doctoral student’s development are the responsibility of the student, graduate administrator, or other faculty members.

Also, faculty may not encourage or emphasize other aspects of development because they were never encouraged and do not have the knowledge or experience in other aspects of doctoral student development, compared to their expertise and knowledge of research. Another explanation could be the current culture of

academia. The responsibility and expectations of a faculty member are extensive and often overwhelming. The current structure of academia provides very few incentives for faculty members to spend additional time and resources ensuring the overall development of doctoral students.

Reliability and Validity of the DSIQ

As mentioned in the literature review, many questionnaires have been developed to measure involvement in specific groups of students (high school, undergraduate, and law students). However, no tool/questionnaire has been developed specifically to measure doctoral student involvement. Because of this a primary objective of this study was to develop a tool that measures doctoral student involvement. The tool that was developed is the Doctoral Student Involvement Questionnaire (DSIQ).

The development of the DSIQ was a multi-step process and the foundation was developed on the research and writing of the scholars of student involvement: Astin, Tinto, Kuh & Pace. After the initial foundation was developed, the questions were formatted, modified and revised based on the research and writing of doctoral students, but more specifically their experiences. Many of questions were adapted from the Re-envisioning the PhD project conducted by Nyquist and Wulff (2004).

The DSIQ was developed based on the writing and research on student involvement and doctoral student development. The DSIQ was divided into two major sections, Academic Information and Background Information. Academic Information is the main part of the questionnaire and is composed of eight segments

(Academic, Research, Teaching, Social, Institutional, Professional, Peer, and Faculty). Those eight segments were intended to coincide with the hypothesized eight dimensions on doctoral student involvement. As the results indicate, only four factors were extracted from the data. More about the four factors will be addressed in the next section. In addition, the Background Information contained 12 socio-demographic questions.

The next step in the development of the DSIQ was to have experts in the fields of undergraduate education, doctoral education, faculty development, leisure studies, student development, and leisure studies review the DSIQ. Questions were modified and a few questions were discarded based on the recommendation of the experts review. Having experts review and revise the DSIQ helped validate its content.

After experts reviewed the DSIQ, it was administered to a small group of leisure studies doctoral students. Sixteen leisure studies doctoral students received and completed the DSIQ in the spring of 2004. In addition to completing the questionnaire, students also provided their suggestions on the clarity and format of each individual question and the overall questionnaire. Based on the doctoral students' recommendation, the questionnaire was revised.

The final step of the development of the questionnaire was to re-test the questionnaire and have the same doctoral students complete the revised DSIQ. In the Summer of 2004 fifteen of the sixteen leisure studies doctoral students completed the questionnaire. The purpose for the test-retest procedure was to assess the consistency and reliability of the questionnaire. The response means,

item means, standard deviations, and alpha coefficients of both set of responses were reviewed, and it was determined that there was a high level of consistency between the two test. This high level of consistency is one indication that the students' comprehensions of the questions were reliable, in that they understood and responded similarly to the same question at two different time periods.

Revisions and modifications were made to individual questions, response categories, and the order of a few questions after each step of the DSIQ development. The overall format of the instrument remained the same after the modifications and revisions were made. The two overall sections were Background Information and Academic Information, with the latter including eight subsections. In addition, the doctoral involvement scale was composed of 58 items and separated out in the eight parts of the Academic Information section.

Each step in the development process of the DSIQ improved the reliability and validity of the DSIQ. First, the DSIQ is based on the theoretical construct of involvement (DeVellis, 1991). Also, experts assessed the DSIQ and based on their recommendations questions were revised and reworded (Denmon, 1987). In addition, a group of doctoral students completed the questionnaire at two different points in time. The test-retest procedure measures the consistency and stability of the questionnaire (Kuh, Hayek, et al. 2001).

The reliability of the DSIQ was assessed by Cronbach's alpha. The Cronbach's alpha for the overall 42 item scale was 0.9289. The Cronbach's alpha of the four factors ranged from 0.9161 to 0.8223. An alpha of 0.7000 or higher is considered acceptable (Garson, 2003). Based on the high alpha level for the overall

scale and the four factors and the developmental process of the DSIQ, the researcher concluded that the DSIQ is a valid and reliable scale to measure involvement in leisure studies doctoral students.

Latent Structure of Doctoral Involvement

An additional objective of this study was to determine the latent structure of leisure studies doctoral student involvement. After an extensive data reduction process, the final factor analysis revealed a 42 item involvement scale with four factors, (1) Peer and Social, (2) Faculty, (3) Academic and Professional, and (4) Research. It was hypothesized, based on previous research on involvement and doctoral education, that there were eight dimensions of involvement (academic, social, faculty, peer, professional, institutional, research, and teaching). Compared to the hypothesized structure of involvement, six of the eight dimensions were revealed in the analysis, indicating a relatively strong support for the hypothesized structure of the DSIQ questionnaire.

Two dimensions, teaching and institutional involvement, were not revealed in the analysis. The teaching dimension had four items in the original 58 item DSIQ scale. Two of those items (formally assessed your own teaching and formally assessed your college teaching) were dropped from the final scale because of low corrected item-total correlation and factor loading score. The additional two items (used the university's teaching development center and observed classes taught by others to learn about teaching) loaded well on the Academic and Professional factor.

The teaching dimension not being revealed in the analysis can be explained on two different levels. The first could be an internal problem. Four questions were developed to measure teaching involvement and only two were retained in the final analysis. Two items were not sufficient to capture this dimension of leisure studies doctoral students. Future research should include additional and better defined questions. Questions should include a student's willingness to teach, the number of classes they have taught and their opinion on the importance of learning how to teach. Also, a larger group of respondents may have revealed a teaching dimension.

Another explanation for why the teaching involvement dimension was not revealed in the analysis could be that leisure studies doctoral students are not actively engaged in teaching and learning how to teach. Doctoral students may not have the opportunity to teach and may not be encouraged to learn how to teach. As mentioned above, less than half (44.3%) of the doctoral students indicated that their faculty advisor emphasized attending workshops and seminars on improving teaching. This would support Kanters' (1992) findings that most leisure studies doctoral students never received any formal training and were not fully prepared to teach in higher education. In addition it supports the finding of the national survey conducted on doctoral students in over 12 disciplines by Golde and Dore (2001) that only 36.1% of the students have been prepared to teach courses and that their respective programs did not prepare them to be teachers. This apparent lack of teaching engagement is a true concern for our profession, and more research

should be conducted in this area to determine if and why more emphasis is not being placed on preparing professors to teach.

The other hypothesized dimension that was not revealed in the analysis was institutional involvement. The initial 58 item DSIQ scale contained 7 items to measure institutional involvement. Two of those items (attended trips to other campuses to learn about other institutions/departments, and served on committees to help craft policies, work on accreditation, engage in governance) were dropped from the final scale because of low corrected item-total correlations and factor loading scores. Also the item, “attended workshops on research administration”, was also dropped because it was duplicated twice in the initial 58 item scale. The additional four items (“attended workshops on career development/opportunities”, “attended workshops or seminars on roles and responsibilities of a professor”, “attended workshops or seminars on student development”, and “attended workshops on the mission and purpose of higher education”) loaded well on the Academic and Professional factor.

The institutional dimension not being revealed in the analysis can be attributed to the small number of items (4) in the final analysis and the small number of respondents in the study. In addition, students at this point in their academic career are probably more interested in developing personal skills and increasing their knowledge in ways that will allow them to succeed in a different institution, rather than spending extra time and energy getting involved with their current institution.

Levels of Doctoral Involvement

The final objective of this study was to determine level of involvement, both overall and for each individual factor. The involvement score of the 42 item scale and the four factors were measured by item means. The items were measured using a four-point Likert type scale, with one indicating low involvement and four indicating high involvement.

Overall Level of Involvement

The overall 42 item mean score was 2.30 with a range from 1.43 to 3.24. This indicated that the students were moderately involved overall and are engaged in some activities more than others. The mean score of 2.30 also provides a baseline score for future studies. However, a mean score of 2.30 is difficult to quantify and interpret, because currently there is not a comparison mean score. The researcher cannot state that an overall mean score of 2.30 is a positive or negative indicator of involvement until additional research is conducted.

Factor 1: Peer and Social Involvement

Peer and Social Involvement Factor's mean score was 2.57 and ranged from 2.01 to 3.02. The two items with the lowest mean score were "met with fellow students to talk about teaching" (mean=2.01) and "met with fellow students to talk about your research" (mean=2.10). The two items with the highest mean score were "met outside of class with other students on campus for a meeting, discussion, or study group" (mean=3.02) and "attended a play, dance, art exhibit or theatrical

performance on campus or sponsored by your institution" (mean=2.85). The findings indicate that students meet with other students less to talk about teaching and their research than meet other students outside of class for a meeting, and study groups.

Students meet more outside of class for study groups and other meetings than for discussions about teaching and research. There may be several reasons why students do not meet to discuss teaching. For example, doctoral students may not talk about teaching with other students because it may not be a priority for the department. Departments may not provide forums (both formal and informal) for doctoral students to talk about teaching. Faculty members may not model this activity, which could make students think that teaching is a solitary activity that is not discussed.

Another reason for the low mean score could be that students may not have had many opportunities, or not taken them, to teach a class and/or learn how to teach. If students do not have the experience of teaching, they may not have a reason to talk about teaching. Also, the lack of experience may affect the student's confidence to talk about teaching with their fellow students.

Leisure studies doctoral students indicated that they also do not meet with fellow students to talk about their research as often as other activities. This was somewhat of a surprise because research is stressed in all phases of the doctoral process. There could be few reasons for the low to moderate mean score. The first is the wording of the item. The item reads "met with fellow student to talk about ***your*** research" it does not ask if they met with fellow students to talk about research

in general. Students may not feel confident talking about their own research with fellow students. Students probably spend more time discussing current research, funding, and statistics with fellow students and spend more time talking with their faculty members about their own research. In addition, first and second year doctoral students may not have started conducting their own research at the time of the survey, which could have skewed the results.

Factor 2: Faculty Involvement

Faculty Involvement Factor's mean score was 2.07 and ranged from 1.73 to 2.60. The two items with the lowest mean score were "professional organizations" (mean=1.74) and "institutional events" (mean=1.79). The two items with the highest mean score were "your progress in the program" (mean=2.61) and "your advisor's research" (mean=2.35). The findings indicate that leisure studies doctoral students spend more time talking with their primary advisor about the progress in the program and their advisor's research compared to talking with them about professional organizations and institutional events. These findings appear to be logical because doctoral students would be more interested in research and their academic progress than institutional events.

Faculty involvement is an element that is critical to the success of all doctoral students' education. This research supports the writings of Tinto, Demon, Nyguist, and others of the importance to faculty involvement. Because of the importance of faculty involvement, the moderately low mean score is somewhat disappointing. As mentioned in the discussion of the overall mean score, at this point in the research

process, the researcher cannot state if a mean score indicates positive or negative levels of involvement, but as important as this element is in ones doctoral student education and development, it would be expected to be higher than the other factors' mean scores.

Factor 3: Academic and Professional Involvement

Academic and Professional Involvement Factor's mean score was 1.80 and ranged from 1.43 to 2.50. This factor had the lowest mean score compared to the other three factors. The two items with the lowest mean score were "observed classes taught by others to learn about teaching" (mean=1.43) and "attended workshops or seminars on research ethics" (mean=1.53). The two items with the highest mean score were "attended workshops on the mission and purpose of higher education" (mean=2.50) and "attended workshops or seminars on student development" (mean=1.90). The findings indicate that leisure studies doctoral students spend more time attending workshops/seminars with the intention to participate in higher education and student development, compared to seminars on research ethics and observing classes being taught so as to learn about teaching methodology. These results follow the same pattern of moderately low level of involvement with teaching.

Factor 4: Research Involvement

Research Involvement Factor's mean score was 2.71 and ranged from 2.21 to 3.24. This factor had the highest mean score compared to the other three factors.

The two items with the lowest mean score were “attended sporting event sponsored by institution” (mean=2.26) and “attended interdisciplinary research seminars” (mean 2.38). The two items with the highest mean score were “conducted research outside of course work” (mean=3.24) and “attended research seminars in discipline” (mean=3.18). Students indicated that they spend more time conducting research outside of their course work and attending research seminars in their respective discipline compared to attending interdisciplinary research seminars. The moderately high involvement score compared to the other three factors is as expected.

One item, “attended sporting event sponsored by institution” initially did not appear to fit well in this factor and was going to be dropped from the factor. However, after reviewing the item and reflecting on the many segments of leisure studies the researcher decided to keep the item. Attending sporting events may be critical to research of doctoral students in commercial recreation and sport management. This item may not be appropriate in assessing doctoral student involvement in other disciplines.

Doctoral Student Involvement

This research also provides some insight into the similarities and differences between doctoral and undergraduate student involvement. There are many parallels between Astin’s theory of student involvement, Tinto’s theory of student departure, and doctoral student involvement. A clear similarity is the multi-dimensionality of involvement. Astin (1984) indicated undergraduate involvement was composed of

seven factors, and Tinto (1993) indicated that involvement was composed of both formal and informal structures of the academic and social systems. This study revealed a multi-dimensional involvement structure and produced a four factor solution. The multiple factors indicate that doctoral students, as with undergraduate students, are actively engaged in more than just one aspect of their education.

In addition, a few of the factors revealed in this study corresponded directly to Astin's seven factors (place of residence, honor program, academic involvement, student-faculty interaction, athletic involvement, involvement in student government, and research involvement). Faculty, research, and academic were identified as involvement factors in both Astin's work and in this study. However, the researcher believes that both the level and type of interaction of doctoral students with respect to faculty and research, is very different from undergraduate students. The researcher would argue that faculty and research involvement are more critical and central to the development of doctoral students. Additional research should be conducted to fully understand the importance of the interaction of doctoral students with faculty and research.

Also, the social and peer involvement factor was revealed by both this study and Astin's work, yet Astin separated those factors into more specific categories such as place of residence, honor programs, athletics and student government. The items in the social and peer involvement factor of this study did not encompass those issues, but instead addressed more formal student-student interactions in departmental functions and meetings. Examples of some items in the social and peer factor include "meeting with students to talk about teaching", "met with students

to talk about course work, plans of work, and faculty", "met with outside of class with other students on campus for a meeting, discussion, or study group", "met with fellow students to talk about research" and "attended departmental social events". The social interaction for doctoral students is important but different from the social interaction of undergraduate students. This supports Tinto's (1993) writing about the importance of the local department and the blurring of academic and social systems in doctoral education. Most of the activities are dictated by the local department and are often difficult to classify as either exclusively social or academic.

One factor that was not addressed by either Tinto or Astin is professional involvement. This study revealed activities and experiences directly related to their future profession. Items in this factor include "attended workshops or seminars on student development", "attended workshops on the mission and purpose of higher education", "used the university's teaching center", and "attended workshops or seminars on roles and responsibilities of a professor". This study does not indicate if this factor is important to a doctoral student, but does indicate it as one of the many activity patterns.

The study findings closely parallel Astin's and Tinto's work on student involvement; however there are also many distinct differences. It is important to better understand both the similarities and differences so administration can determine what education policy can be borrowed and adapted from undergraduate education and what new policy must be created specifically for the development of doctoral students.

Implications of the Study

The purpose of this study was to expand the knowledge of involvement to the realm of doctoral student education and development. Involvement was defined by Alexander Astin (1984; 1999) as "the amount of physical and psychological energy that the student devotes to the academic experience" (p. 518). This study produced a four factor solution indicating that the physical and psychological energy that doctoral students devote to their academic experiences is multi-dimensional and multi-faceted. As with undergraduate students, the researcher believes that doctoral students should not be one-dimensional and should have a balance between the many dimensions of their academic careers. This research does not imply that there is balance, but it does indicate that the investment of physical and psychological energy of leisure studies doctoral students does not solely focus on one aspect of their educational process.

The most important implication of this study is that it provided a building block for future studies in doctoral student involvement. A tool (DSIQ) was developed to measure doctoral student involvement that can be adapted and used to conduct additional research in doctoral student assessment. As with undergraduate student involvement, the levels of involvement may be predictors of a doctoral student's willingness to persist, preparedness, and satisfaction. The DSIQ is one of the first assessment tools developed to better understand the development of doctoral student development.

In addition, this study is a step towards better understanding the effectiveness of current leisure studies doctoral education. The multi-dimensional structure of

involvement indicates leisure studies doctoral students are involved in at least four main aspects of their academic experience. By better understanding those four aspects of engagement, policies and programs can be enhanced to strengthen the doctoral curriculum of leisure studies. This study also provides baseline data for future studies in doctoral student involvement. Levels of involvement were measured so they can be compared with future studies of doctoral students' involvement. This is the first step in determining if there is an optimum level of involvement for each of the four factors and overall or if level of involvement is student, program, discipline or institutional dependent. If the optimum amounts of involvement can be determined it will assist in guiding the development of more effective educational practice and policy for doctoral education. Understanding the structure and level of involvement is a first step in being able to develop programs and policies that encourage doctoral students to take an active role in their development and education.

Another implication of this study is for current faculty members. This study provides an insight into the activity patterns of their current doctoral students. Faculty members can use this information to assess their effectiveness with respect to the development of their doctoral students. In addition, this study confirmed the importance of the faculty-student interaction in the doctoral education process. The findings of this research indicate that it may be important to stress the importance of faculty-student interaction and to encourage faculty members to become a more involved in a doctoral student's education. Faculty members may need to re-

evaluate both the manner and the type of activities they encourage their doctoral students to participate in.

This study contributes to the body of knowledge of doctoral student education and the theory of student involvement by providing a tool to measure involvement in doctoral students and by identifying four factors (peer and social, faculty, academic and professional, and research) of leisure studies doctor student involvement. These two items can help administrations develop and revise programs and policies that can enhance and strengthen the doctoral education process. Enhancing and strengthening doctoral education will enhance and strengthen our profession and its future scholars.

Recommendations for Future Studies

Additional research should be conducted to better understand involvement and its importance and relevance to both doctoral students and doctoral education. Additional items should be developed to strengthen and validate the four factors of doctoral student involvement. More items should be developed to see if other dimensions, such as teaching, are part of doctoral students' activity patterns. In addition, items should be developed to capture each discipline's specific norms and values. The 42 item DSIQ is specifically for leisure studies, but with additional items the DSIQ could measure other disciplines' level of involvement.

Astin (1999) stated that involvement could be measured by both quantitative and qualitative methods; however this study only focused on quantitative measures. Additional research should be conducted by conducting interviews and focus groups with current doctoral students, faculty members, and recent doctoral graduates. Historical data and exit interviews should be reviewed and analyzed. As stated above this study provides a building block for future studies, yet there is still much work that can and has to be done to truly enhance the doctoral education. Below are additional recommendations for future research:

1. The current DSIQ questionnaire and scale need to be replicated and validated. This study was exploratory by nature, and the 42 item scale and four factors should be validated. In addition, a study should be conducted with a larger sample.

2. A longitudinal study should be conducted to determine if the amount of involvement influences the retention and attrition rates of doctoral students.
3. Future research should investigate the relationship between the level of faculty-student interaction and level of involvement.
4. Additional research should be conducted to determine appropriate levels of involvement. Can a doctoral student be overly involved? Is there an optimum level of involvement or is it dependent on other variables such as background and current academic stage? What is the ideal balance between the multiple dimensions of doctoral student involvement?
5. Attempts should be made to replicate this study with doctoral students in different disciplines. Comparative analysis should be conducted to determine if levels of involvement and structure components of doctoral student involvement are analogous between disciplines. This includes comparing the differences in involvement of doctoral students in the social and hard sciences.
6. Future studies should determine the correlation between the level of involvement and a doctoral student's willingness to persist.
7. Additional research should be conducted to examine the relationship between involvement and doctoral students' satisfaction.
8. The relationship between socio-demographic variables and involvement should be investigated. Is the level of involvement influenced by gender,

race, marital status, enrollment status, current academic standing, and career path?

9. Comparative analysis should be conducted to determine if a doctoral student's level of involvement during his or her doctoral educational impacts the level of effectiveness and preparedness as a faculty member. Are faculty members who were more involved as doctoral student better prepared?
10. Further research should be conducted to determine if there is a relationship between financial variables, such as assistantship, full time employment, and financial aid and levels of involvement. Does a working part or full time affect the amount of physical and psychological energy doctoral students can put into their doctoral education?
11. A model of doctoral student development should be developed. Involvement is just one of the many components that influence and affect doctoral students' development. It is important to distinguish between the many components and map out their relationships and levels of interaction.

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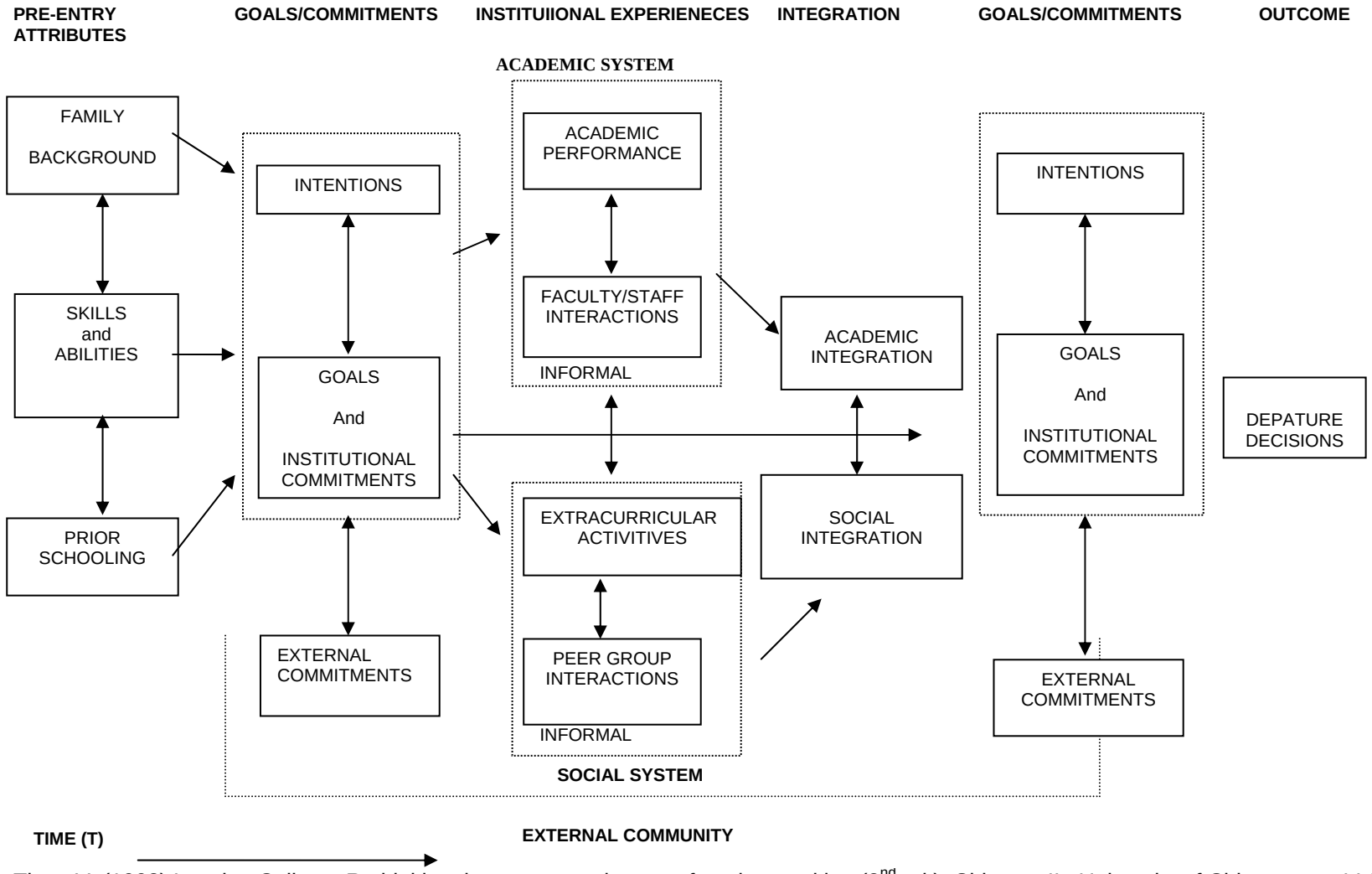
Appendix A

Tinto's Model of Institutional Departure



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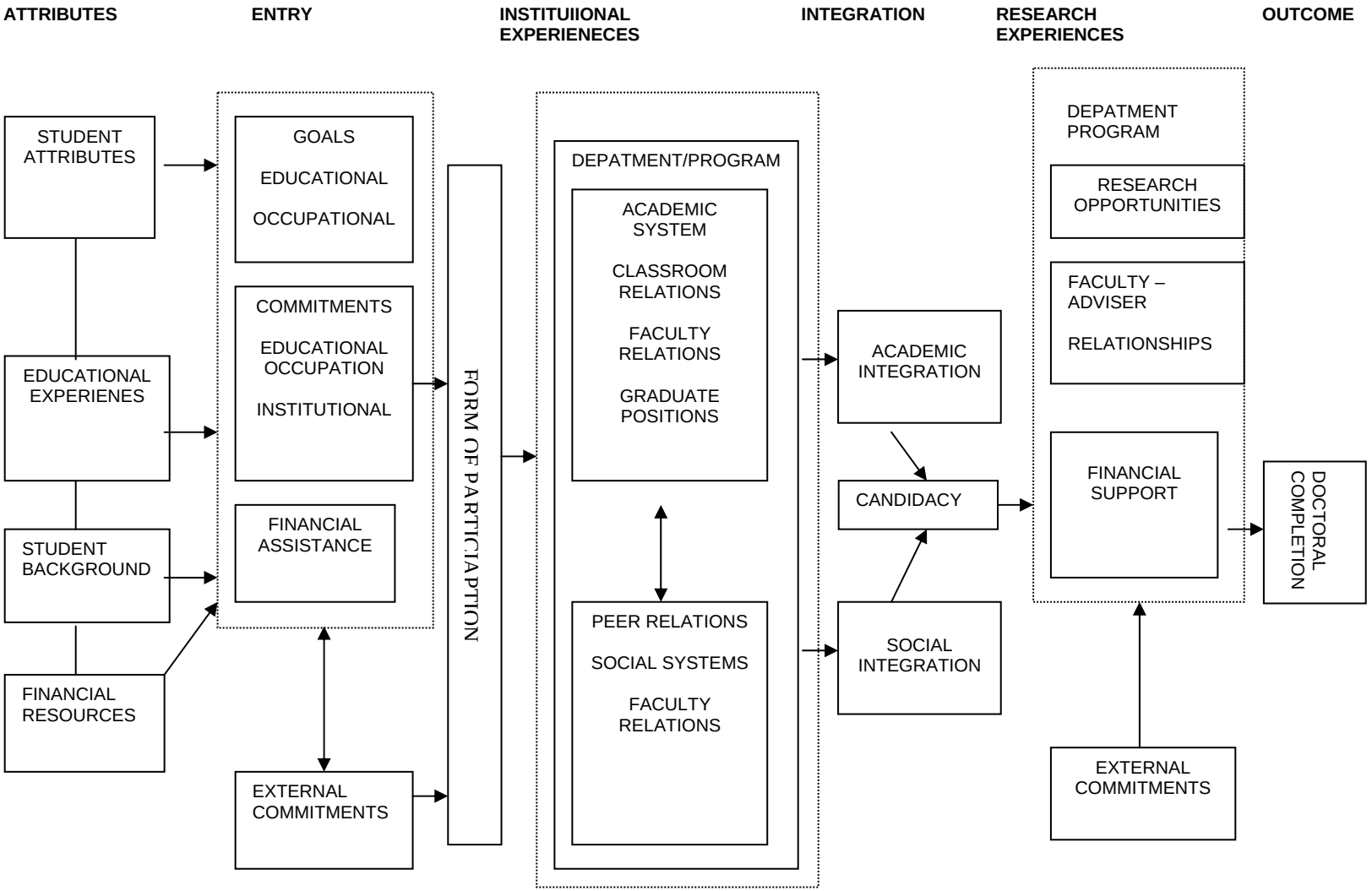
Appendix B

Tinto's Model of Doctoral Persistence



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Appendix C
Doctoral Student Involvement Questionnaire

Leisure Studies Doctoral Students Questionnaire

Direction: Please indicate your answer by filling in one of the responses under each question. Before you begin answering the questionnaire, please type in your Code#.

CODE # _____

Academic Information

A. Do you attend class regularly?

☐ Yes

☐ No

B. Did you attend graduate orientation?

☐ Yes

☐ No

C. During your doctoral education, approximately how often have you done the following?

	Very Often	Often	Sometimes	Never
Use the library regularly for conducting research, preparing reports/papers, and/or studying	☐	☐	☐	☐
Use computer facilities on campus for conducting research, preparing reports/papers and or studying	☐	☐	☐	☐
Assist in bringing speakers to campus	☐	☐	☐	☐
Request the library to subscribe to a particular journal	☐	☐	☐	☐
Request the computing service to purchase software	☐	☐	☐	☐

D. During your doctoral education, approximately how many hours have you done the following in a typical 7-day week?

	Less than 5 hrs	Between 5 to 10 hrs	Between l1 and 20 hrs	Between 21 and 30 hrs	More than 30 hrs
Reading	☐	☐	☐	☐	☐
Writing	☐	☐	☐	☐	☐
Studying	☐	☐	☐	☐	☐

E. Do you currently have a research paper or presentation submitted for publication?

☐ Yes

☐ No

F. During your doctoral education, approximately how often have you done the following?

	Four or more times	2 to 3 times	Once	Never
Conducted research outside of your course work	☐	☐	☐	☐
Attended research seminars in your discipline	☐	☐	☐	☐
Attended interdisciplinary research seminars	☐	☐	☐	☐
Generated and used research data	☐	☐	☐	☐
Attended workshops or seminars on research ethics	☐	☐	☐	☐
Attended workshops on research administration	☐	☐	☐	☐
Reviewed papers for publication or presentation	☐	☐	☐	☐

G. Which of following have you had the opportunity to learn about at your institution during your doctoral education? (Check all that apply)

☐ Avoiding conflicts of interest
☐ Using copyrighted information appropriately
☐ Appropriate use of funds
☐ Grant writing and grant budgeting
☐ Technology transfer
☐ How to publish
☐ Research ethics

H. During your doctoral education, approximately how often have you done the following?

	Four or more times	2 to 3 times	Once	Never
Formally assessed your colleagues' teaching	☐	☐	☐	☐
Formally assessed your own teaching	☐	☐	☐	☐
Used the university's teaching development center	☐	☐	☐	☐
Observed classes taught by others to learn about teaching	☐	☐	☐	☐

I. During your doctoral education, have you done the following?

	Yes	No
Taught a course on your own	☐	☐

Been a teaching assistant or done supervised teaching	☐	☐
Attended seminars or workshops on teaching strategies	☐	☐
Attended seminars or workshops on student learning styles	☐	☐
Attended seminars or workshops on classroom management	☐	☐

J . Which of the following have you had the opportunity to do at your institution during your doctoral education?(Check all that apply)

- ☐ Take a course designed specifically to train you to teach in college
- ☐ Develop or revise the department curriculum
- ☐ Develop a course
- ☐ Incorporate new instructional technologies into the classroom

K. During your doctoral education, approximately how often have you done the following?

	Very Often	Often	Sometimes	Never
Attended departmental social events	☐	☐	☐	☐
Attended graduate student associations' socials	☐	☐	☐	☐
Attended a play, dance, art exhibit or theatrical performance on campus or sponsored by your institution	☐	☐	☐	☐
Attended a sporting event on campus or sponsored by your institution	☐	☐	☐	☐
Attended a concert or other musical event on campus or sponsored by your institution	☐	☐	☐	☐
Participated in intramural athletics	☐	☐	☐	☐
Participated in campus clubs, student organizations, or student government	☐	☐	☐	☐
Participated in activities to enhance your spirituality (meditation, prayer, worship, etc)	☐	☐	☐	☐

L . Which of the following have you done at your institution during your doctoral education?(Check all that apply)

- ☐ Participated in university and community partnerships
- ☐ Spent time with undergraduates outside the classroom
- ☐ Applied your expertise to campus organizations
- ☐ Served on academic senate
- ☐ Served on departmental or university committees
- ☐ Served on disciplinary committees

Participated in "Preparing Future Faculty" programs

M. During your doctoral education, approximately how often have you done the following?

	Four or more times	2 to 3 times	Once	Never
Attended trips to other campuses to learn about other institutions/ departments				
Attended workshops on career development/opportunities				
Attended workshops or seminars on roles and responsibilities of a professor				
Attended workshops on research administration				
Attended workshops or seminars or student development				
Attended workshops on the mission and purpose of higher education				
Served on departmental and or institutional-wide committees to help craft policies, work on accreditation, engage in university governance				

N. Do you belong to any professional organizations?

Yes

No

O. During your doctoral education, approximately how often have you done the following?

	Four or more times	2 to 3 times	Once	Never
Attended professional conferences or meetings				
Participated in consulting projects not associated with your department or institutions				
Participated in an outreach or extension project				
Worked in a team on research				
Worked in a team on teaching				
Worked collaboratively on writing for publication				

P. Do you currently subscribe to any professional organization publication?

Yes

No

Q. During your doctoral education, approximately how often have you done the following?

	Very Often	Often	Sometimes	Never

Met outside of class with other students on campus for a meeting, discussion, or study group	☐	☐	☐	☐
Met with fellow students to talk about current events	☐	☐	☐	☐
Met with fellow students to talk about your research	☐	☐	☐	☐
Met with fellow students to talk about teaching	☐	☐	☐	☐
Met with students to talk about faculty advisors	☐	☐	☐	☐
Met with students to talk about course work, plans of work, and faculty	☐	☐	☐	☐
Attended departmental social events with other fellow students	☐	☐	☐	☐
Attended informal dinners and get-togethers with other fellow students	☐	☐	☐	☐
Interacted with students whose race or ethnic background is different from yours	☐	☐	☐	☐
Interacted with students whose philosophy of life or personal values are different from yours	☐	☐	☐	☐
Interacted with students whose family background are different than yours	☐	☐	☐	☐

R. Do you have a primary faculty advisor?

☐ Yes

☐ No

S. During this school year in your doctoral education, approximately how often do you meet with your faculty advisor to discuss?

	Very Often	Often	Sometimes	Never
Your advisor's research	☐	☐	☐	☐
Course work	☐	☐	☐	☐
Professional organizations	☐	☐	☐	☐
Current events in your discipline	☐	☐	☐	☐
Your progress in the program	☐	☐	☐	☐
Professional relationships with others in your discipline	☐	☐	☐	☐
Up-coming presentations	☐	☐	☐	☐
Applying and writing grants	☐	☐	☐	☐

Institutional events				

T. Does your faculty advisor emphasize each of the following?

	Yes	No
Attending workshops or seminars on improving teaching		
Attending regional and national conferences		
Attending research presentations		
Attending workshops or seminars on student development		
Attending workshops or seminars on roles and responsibilities of a college professor		
Serving on departmental and/or institution-wide committees to help craft policies, accreditations, or engage in university governance		
Participating in “Preparing Future Faculty” programs		
Developing a teaching portfolio		
Developing a research portfolio		

Background Information

1. Gender

- Male
- Female

2. Year of Birth

3. Race or ethnic identification

- African American or Black
- American Indian or Native American
- Asian American
- Hispanic, or of Spanish Origin
- White - Not of Hispanic Origin
- Multiracial -- Please specify
- Other -- Please specify

4. Marital Status

- [ ] Single
- [ ] Married
- [ ] Living with partner
- [ ] Divorced
- [ ] Separated
- [ ] Widowed

5. Do you currently have children or dependents living in your home?

- [ ] Yes
- [ ] No

6. What is your current enrollment status?

- [ ] Full-time
- [ ] Part-time

7 . How many years have you been enrolled in your doctoral studies?

- [ ] Less than a year
- [ ] One
- [ ] Two
- [ ] Three
- [ ] Four
- [ ] Five
- [ ] Six
- [ ] Seven
- [ ] Eight or more

8. What have most of your grades been up to now in your doctoral studies

- [ ] A+
- [ ] A
- [ ] A-
- [ ] B+
- [ ] B
- [ ] B-
- [ ] Our institution does not give grades

9. Did you receive an undergraduate or master's degree in leisure studies?

Yes

No

10 . How would you best describe your current academic stage of your program?

Taking course work

Just finished taking all my courses

Completed your preliminary exam and working on dissertation

Completed dissertation

11 . What career path do you foresee yourself pursuing?(Check all that apply)

Professor at a college or university (faculty position)

Teacher (but not in higher education)

Research at a college or university (non-faculty position)

Administrator at a college or university

Researcher in business, industry or private sector

Administrator/Manager in business, industry, or private sector

Research in public, non-profit or government agency

Administrator/Manager in a public, non-profit, or government agency

Independent researcher, consultant, or writer

Self-employed

Not be employed for pay

12 . If you had the chance to do things over again would you pursue your doctoral education?

No

Yes

Yes, but only at different institution

THANK YOU

Submit Reset

If you have problems submitting this questionnaire please contact David Cardenas at dacarden@unity.ncsu.edu or (919) 515-9571

Appendix D
E-mail Request for Student Information

Dear Graduate Student Administrator, Study #04-9201

I am a doctoral student in the Department of Parks, Recreation, and Tourism Management at NC State University and I am writing to you regarding a research project I am conducting. The purpose of my research is to document doctoral students' experiences while they complete their degree, which includes both their academic and social experiences.

In order to complete this research project I am requesting a list of your current doctoral students (both full and part-time) and their e-mail addresses. The information you provide will be kept confidential and will not be shared with anyone or any other organization, and will only be used for this particular study. When you provide this information, your students will receive an explanation of my study, as well as a link to the questionnaire and a password via email. The password will allow doctoral students access to the questionnaire. When the students complete the questionnaire the data will be sent directly to a password protected computer servers on campus at North Carolina State University.

The confidential questionnaire will take approximately 20-30 minutes to complete. After the study is complete I hope to publish the findings at our national conference. If you are interested in receiving a copy of the questionnaire, I would be happy to send it to you. In the meantime, please send the list of your doctoral students' names and e-mails directly to me at dacarden@unity.ncsu.edu or send to the NCSU department mailing address listed below. Thank you for your assistance and if you have any questions or concerns please feel free to contact me via e-mail or via phone at (919) 515-9571.

David A. Cárdenas
Research Assistant
North Carolina State University
Department of Parks, Recreation & Tourism Management
Box 8004, NCSU
Raleigh, NC 27965
(919) 515-9571
(919) 515-3687 (fax)
dacarden@unity.ncsu.edu

Beth E. Wilson, Ph.D.
Associate Department Head
North Carolina State University
Department of Parks, Recreation & Tourism Management
Box 8004, NCSU
Raleigh, NC 27695
(919) 515-3665
(919) 515-3687 (fax)
beth_wilson@ncsu.edu

Appendix E
Student Participation Request

Dear Doctoral Student, Study #04-9201

Currently I am conducting research on doctoral students in our discipline (park, recreation, and leisure) as part of my dissertation. The purpose of my research is to document doctoral students' experiences while they complete their degree, which includes both their academic and social experiences. To be able to do this I need your help and hope that you are willing to participate in this study.

The purpose of this e-mail is to request a few minutes of your time to complete a questionnaire. Below is a URL with the questionnaire website, as well as the username, and password which provides you access to the questionnaire. To begin the questionnaire you need to click on the URL below, type your username and password. This will give you access to the questionnaire Also below is your code#, which you will need to enter at the beginning of the questionnaire.

Findings from the study will be published, however your personnel information and responses will not be shared and will be kept completely confidential. As soon as the research is complete I will destroy all the data.

When you complete the questionnaire the data will be sent directly to a password protected computer server on campus at North Carolina State University. As an incentive to participate, one randomly chosen doctoral student will receive a $50 voucher to pay for this year's NRPA congress student registration fee. Thank you for your assistance and if you have any questions or concern please feel free to contact me via e-mail at dacarden@unity.ncsu.edu or via phone at (919) 515-9571.

Website: http://www2.ncsu.edu/unity/lockers/project/dsiq/DSIQ.php

Username: leisure
Password: dsiq

Your code:

David A. Cárdenas
Research Assistant
North Carolina State University
Department of Parks, Recreation & Tourism Management
Box 8004, NCSU
Raleigh, NC 27965
(919) 515-9571
(919) 515-3687 (fax)
dacarden@unity.ncsu.edu

Appendix F
Reminder E-mail

Dear Doctoral Student, Study #04-9201

Recently you received an e-mail asking you to participate in a study of doctoral students experiences. If you have completed and submitted the questionnaire, Thank You! If you have not completed the questionnaire, I hope that you will be able to take a few minutes to do so. If you have not received the initial e-mail a copy of the original e-mail is below. If you have any questions or have had problems submitting the questionnaire please contact me by phone or e-mail. Remember that your participation in the research will include you in a drawing to receive a $50 voucher to pay for this year's NRPA congress student registration fee.

Website: http://www2.ncsu.edu/unity/lockers/project/dsiq/DSIQ.php

Username: leisure
Password: dsiq

Your code:

Sincerely

David A. Cárdenas
Research Assistant
North Carolina State University
Department of Parks, Recreation & Tourism Management
Box 8004, NCSU
Raleigh, NC 27965

Appendix G
Descriptive Characteristics of the Leisure Studies Doctoral Students

Supplementary Academic Items	Percent	Frequency
Attended class regularly		
Yes	95.7%	110
No	4.3%	5
Non-Response		
Attended graduate orientation		
Yes	73.0%	84
No	27.0%	31
Non-Response		
Hours spent reading in a typical 7-day week		
Less than 5 hours	1.7%	2
Between 5 and 10 hours	20.0%	23
Between 11 and 20 hours	35.7%	41
Between 21 and 30 hours	25.2%	29
More than 30 hours	16.5%	19
Non-Response	0.9%	1
Hours spent writing in a typical 7-day week		
Less than 5 hours	9.6%	11
Between 5 and 10 hours	27.0%	31
Between 11 and 20 hours	42.6%	49
Between 21 and 30 hours	13.9%	16
More than 30 hours	5.2%	6
Non-Response	1.7%	2
Hours spent studying in a typical 7-day week		
Less than 5 hours	7.8%	9
Between 5 and 10 hours	22.6%	26
Between 11 and 20 hours	27.0%	31
Between 21 and 30 hours	22.6%	26
More than 30 hours	17.4%	20
Non-Response	2.6%	3
Currently have a research paper or presentation submitted for publication		
Yes	51.3%	59
No	47.0%	54
Non-Response	1.7%	2
Had the opportunity to learn during doctoral education		

Appendix G Continued		
Avoiding conflict of interest	40.9%	47
Using copyrighted information appropriately	67.0%	77
Appropriate use of funds	40.9%	47
Grant writing and grant budgeting	71.3%	82
Technology transfer	31.3%	36
How to publish	65.2%	75
Research ethics	65.2%	75
Taught class on their own		
Yes	55.7%	64
No	43.5%	50
Non-Response	0.9%	1
Been a teaching assistant or done supervised teaching		
Yes	65.2%	75
No	33.9%	39
Non-Response	0.9%	1
Attended seminars or workshops on teaching strategies		
Yes	58.3%	67
No	40.9%	47
Non-Response	0.9%	1
Attended seminars or workshops on student learning strategies		
Yes	32.2%	37
No	67.0%	77
Non-Response	1	0.9%
Attended seminars or workshops on classroom management		
Yes	32.2%	37
No	67.0%	77
Non-Response	1	0.9%
Had the opportunity to learn during doctoral education		
Take a course to train them in college teaching	33.9%	39
Developed or revised the department curriculum	28.7%	33
Developed a course	33.9%	39
Incorporated new instructional technologies into the classroom	43.5%	50
Had the opportunity to do during doctoral education		
Participate in university and community partnership	47.8%	55
Spent time with undergraduate outside the classroom	53.0%	61
Applied your expertise to campus organizations	30.4%	35

Appendix G Continued		
Served on academic senate	4.3%	5
Served on departmental or university committees	44.3%	51
Served on disciplinary committees	1.7%	2
Participated in “Preparing the Professorate”	17.4%	20
Belong to any professional organizations		
Yes	87.0%	100
No	13.0%	15
Non-Response		
Subscribe to any professional organization publication		
Yes	59.1%	68
No	38.3%	44
Non-Response	2.6%	3
Have a primary advisor		
Yes	98.3%	113
No	0.9%	1
Non-Response	0.9%	1
Does faculty advisor emphasize attending workshops or seminars on improving teaching		
Yes	44.3%	51
No	55.7%	64
Non-Response		
Does faculty advisor emphasize attending regional and national conferences		
Yes	82.6%	95
No	17.4%	20
Non-Response		
Does faculty advisor emphasize attending research presentations		
Yes	80.0%	92
No	20.0%	23
Non-Response		
Does faculty advisor emphasize attending workshops on student development		
Yes	32.2%	37
No	67.8%	78
Non-Response		
Does faculty advisor emphasize attending workshops on roles of professors		
Yes	27.8%	32
No	70.4%	81
Non-Response	1.7%	2

Appendix G Continued		
Does faculty advisor emphasize serving on departmental committees to help		
Yes	27.8%	32
No	72.2%	83
Non-Response		
Does faculty advisor emphasize participating in "Preparing Future Faculty"		
Yes	15.7%	18
No	81.7%	94
Non-Response	2.6%	3
Does faculty advisor emphasize developing a teaching portfolio		
Yes	41.7%	48
No	57.4%	66
Non-Response	0.9%	1
Does faculty advisor emphasize developing a research portfolio		
Yes	65.2%	75
No	34.8%	40
Non-Response		

Appendix H
Correlation Matrix of DSIQ's Original 58 Item Scale

	ACALIBRA	ACACOMPT	ACASPEAK	ACAJOURN	ACASOFTW
ACALIBRA	1.0000				
ACACOMPT	0.1707	1.0000			
ACASPEAK	0.1020	-0.0224	1.0000		
ACAJOURN	0.1903	0.2114	-0.0214	1.0000	
ACASOFTW	0.1537	0.1352	0.1719	0.2500	1.0000
RESOUTSI	0.0028	-0.1416	0.2227	-0.0417	0.0864
RESEMINA	0.1160	-0.0081	0.2459	0.0482	0.1563
RESINTER	0.1662	0.0380	0.2351	0.1902	0.0775
RESGENER	0.0301	0.1340	0.1984	-0.0290	0.1791
RESATTET	0.0440	-0.0835	0.1777	0.0546	-0.0324
RESADMIN	0.0175	-0.0571	0.2332	0.1019	0.1500
RESREVIE	0.0630	0.1066	0.2521	0.1195	0.0612
TEACOLLE	0.1202	0.1690	0.1169	0.0356	-0.0356
TEACYOUR	-0.0154	0.0121	0.2196	-0.0425	0.1143
TEACENTE	-0.1262	-0.1090	0.1823	0.0903	0.1921
TEACLASS	-0.0553	0.0250	0.1525	0.0151	0.0932
SOCDEPAR	-0.0220	0.0985	0.2980	0.1091	0.2122
SOCASSOC	0.0294	0.1600	0.0278	-0.0544	0.1290
SOCPERFO	0.2202	0.2149	0.0313	0.1611	0.1354
SOCSPORT	0.0130	0.1037	0.1484	0.0504	0.2932
SOCCONCE	0.2039	0.0913	0.0118	0.0785	0.0656
SOCINTER	-0.0409	0.1091	-0.0318	0.1376	0.1083
SOCLUBS	0.0202	-0.0158	-0.0012	-0.1703	-0.1279
SOCSPIRT	0.0306	-0.0599	-0.0047	0.0907	-0.0190
INSTTRIP	-0.0552	-0.0015	0.2444	-0.0828	0.0228
INSTCARE	0.0377	-0.0090	0.1710	0.1132	0.0170
INSTPROF	-0.0417	-0.1063	0.2157	0.0247	0.2468
INSTADMI	0.0708	-0.1633	0.2365	0.0633	0.2662
INSTUDEN	0.0603	-0.0689	0.2887	0.0949	0.2343
INSTEDUC	0.1265	-0.0950	0.2578	0.0012	0.0654
INSTGOVE	-0.1384	-0.0422	0.1565	-0.0179	0.1548
PROFMEET	-0.1143	-0.0545	0.2923	0.0204	0.1555
PROFCONS	-0.0492	-0.0084	0.1817	-0.0533	0.0600
PROFEXTE	-0.0842	-0.1023	0.2832	-0.0178	0.1760
PROFRESE	-0.0103	0.0418	0.1482	0.1416	0.1935
PROTEACH	-0.0285	0.0604	0.0686	0.0973	0.1409
PROPUBLI	0.0937	-0.0429	0.0970	0.0516	0.2156
PEERSTUD	-0.0037	0.1683	0.1496	0.0358	0.2051

	ACALIBRA	ACACOMPT	ACASPEAK	ACAJOURN	ACASOFTW
PEEREVEN	-0.2491	0.1937	-0.0119	0.0052	0.2121
PEERESEA	-0.1468	0.0922	0.1355	0.0447	0.2120
PEERTEAC	-0.2600	0.1055	0.0766	0.0307	0.2319
PEERADVI	-0.1474	0.2193	-0.0074	0.1464	0.3138
PEERWORK	-0.1695	0.2193	-0.0020	0.1250	0.2683
PEERSOCI	-0.0222	0.0740	0.2987	0.1493	0.2263
PEERINFO	-0.0975	0.0980	0.1873	0.0537	0.2053

Appendix H Continued					
PEERFAMI	0.0109	0.1425	0.0845	-0.0128	0.2375
PEERVALU	0.0303	0.0938	0.1014	-0.0681	0.2397
PEERETHN	0.0079	0.2010	0.0718	-0.0053	0.1786
FACRESEA	0.1385	0.1177	0.1698	0.1350	0.1697
FACOURSE	-0.0207	0.0719	-0.0104	0.1173	0.0977
FACPROFE	0.0239	0.0826	0.0965	0.1463	0.2735
FACDISCI	0.0378	-0.0812	0.1379	0.1236	0.2098
FACPROGR	0.0442	0.0201	0.2017	-0.0055	0.2444
FACOTHER	0.0606	0.0665	0.2338	0.1547	0.2845
FACGRANT	0.1417	0.1141	0.2312	0.2010	0.2540
FACLIFE	-0.0924	0.0831	0.0942	0.0533	0.2024
FACINSTI	0.0617	0.1168	0.0289	0.1618	0.2306
FACDEPAR	0.0507	0.0564	0.1831	0.1424	0.2798

	RESOUTSI	RESEMINA	RESINTER	RESGENER	RESATTET
RESOUTSI	1.0000				
RESEMINA	0.3132	1.0000			
RESINTER	0.2584	0.5059	1.0000		
RESGENER	0.4788	0.3675	0.3089	1.0000	
RESATTET	0.0515	0.2823	0.4406	0.1735	1.0000
RESADMIN	0.1062	0.2419	0.3370	0.2233	0.6175
RESREVIE	0.2172	0.2461	0.2332	0.2718	0.1690
TEACOLLE	0.0167	0.1017	0.0274	0.1404	0.1013
TEACYOUR	0.0420	0.1864	0.0438	0.0109	0.1784
TEACENTE	0.1169	0.2291	0.1687	0.0531	0.2537
TEACLASS	0.0822	0.3632	0.1862	0.1480	0.3081
SOCDEPAR	0.2346	0.2026	0.1602	0.2113	0.1819
SOCASSOC	-0.1029	0.0897	0.0747	0.0115	0.0745
SOCPERFO	0.1069	0.2426	0.1684	0.0894	-0.0231
SOCSPORT	0.3463	0.3111	0.2179	0.3229	0.0175
SOCCONCE	0.0906	0.1539	0.0695	0.1583	0.0233
SOCINTER	-0.0224	-0.0434	-0.0854	-0.1566	-0.0132

	RESOUTSI	RESEMINA	RESINTER	RESGENER	RESATTET
SOCLUBS	-0.0282	0.1837	0.3338	-0.0549	0.2244
SOCSPIRT	0.0633	0.0064	0.0337	-0.1190	-0.0094
INSTTRIP	0.2389	0.1731	0.2339	0.0661	0.0688
INSTCARE	0.2306	0.3087	0.3218	0.1857	0.3301
INSTPROF	0.1562	0.2416	0.1621	0.1830	0.2868
INSTADMI	0.1736	0.2125	0.2548	0.2247	0.3826
INSTUDEN	0.1424	0.2434	0.3327	0.1727	0.4839
INSTEDUC	0.3096	0.1487	0.1138	0.2544	0.3403
INSTGOVE	0.0991	0.0507	0.1079	0.1706	0.1261

Appendix H Continued					
PROFMEET	0.3219	0.4526	0.2538	0.2639	0.1828
PROFCONS	0.2395	0.1369	0.0355	0.0941	-0.0964
PROFEXTE	0.2308	0.1683	0.1811	0.1148	0.3205
PROFRESE	0.4736	0.2138	0.2630	0.5037	0.0272
PROTEACH	0.1722	0.1578	0.2465	0.2765	0.2269
PROPUBLI	0.5481	0.4519	0.4036	0.4363	0.1648
PEERSTUD	-0.0249	0.1438	0.0382	0.1314	0.1134
PEEREVEN	0.1259	0.0532	0.0027	0.2054	-0.0349
PEERESEA	0.2089	0.3810	0.1570	0.2213	0.0930
PEERTEAC	0.1287	0.3154	0.0439	0.2163	0.1961
PEERADVI	0.0719	0.1468	-0.0062	0.1909	-0.0093
PEERWORK	0.1041	0.1965	0.0657	0.1920	-0.0286
PEERSOCI	0.1915	0.3100	0.2048	0.2354	0.2438
PEERINFO	0.2085	0.2772	0.1875	0.2405	0.1340
PEERFAMI	0.1956	0.1598	0.1172	0.2492	0.0244
PEERVALU	0.1813	0.2770	0.1191	0.2428	0.0242
PEERETHN	-0.0034	0.1670	0.1268	0.1604	0.0999
FACRESEA	0.3620	0.2115	0.1997	0.4334	0.0859
FACOURSE	0.0983	0.1669	0.1669	0.1699	0.0778
FACPROFE	0.1665	0.2429	0.2038	0.2296	0.1933
FACDISCI	0.3110	0.2022	0.2454	0.2351	0.1552
FACPROGR	0.2882	0.2462	0.1965	0.2766	0.0695
FACOTHER	0.2999	0.3213	0.2222	0.3799	0.1185
FACGRANT	0.2747	0.2088	0.2470	0.3702	0.0143
FACLIFE	0.2033	0.2028	0.1648	0.2504	0.0746
FACINSTI	0.2007	0.2552	0.1863	0.3267	0.0640
FACDEPAR	0.2120	0.2047	0.1725	0.2912	0.1073

	RESADMIN	RESREVIE	TEACOLLE	TEACYOUR	TEACENTE
RESADMIN	1.0000				
RESREVIE	0.3333	1.0000			
TEACOLLE	0.1028	0.2602	1.0000		
TEACYOUR	0.1874	0.1016	0.2483	1.0000	
TEACENTE	0.3236	0.1319	0.0629	0.2712	1.0000
TEACLASS	0.2165	0.1316	0.1348	0.3159	0.4502
SOCDEPAR	0.1653	0.1717	0.0605	0.1150	0.3302
SOCASSOC	0.1245	0.0814	-0.0203	0.0900	0.2170
SOCPERFO	-0.1027	-0.0149	-0.0171	0.2515	0.1349
SOCSPORT	0.0105	0.0496	-0.0391	0.0488	0.0354
SOCCONCE	0.0077	-0.0835	0.0901	0.0901	0.0020
SOCINTER	0.0872	-0.0669	0.0384	-0.0229	-0.0209

Appendix H Continued					
SOCLUBS	0.1825	0.1236	-0.0197	0.0851	0.0356
SOCSPIRT	-0.0462	0.0123	-0.1050	-0.2104	0.0582
INSTTRIP	0.1927	0.0899	-0.0766	0.0438	0.1461
INSTCARE	0.2468	0.1598	0.0869	0.0951	0.2037
INSTPROF	0.3126	0.1350	-0.0961	0.1959	0.3798
INSTADMI	0.6075	0.2183	0.0796	0.1268	0.2771
INSTUDEN	0.4464	0.0624	-0.1174	0.1397	0.2353
INSTEDUC	0.2650	0.0319	-0.0676	0.1493	0.0115
INSTGOVE	0.1815	0.0807	-0.0957	0.0689	0.2322
PROFMEET	0.1780	0.3610	0.2322	0.1180	0.3232
PROFCONS	-0.0160	-0.0262	-0.1311	-0.0728	0.0268
PROFEXTE	0.2401	-0.1012	-0.0754	0.1555	0.1889
PROFRESE	0.0397	0.2457	-0.0165	-0.0524	-0.0198
PROTEACH	0.0768	0.0969	-0.1164	0.0633	0.1848
PROPUBLI	0.1885	0.3643	0.1058	-0.0218	0.2232
PEERSTUD	0.0638	0.0885	0.1005	0.1801	0.1776
PEEREVEN	0.1049	-0.0973	0.0826	0.0786	0.0486
PEERESEA	0.1419	0.0516	0.1134	0.1988	0.1479
PEERTEAC	0.2396	0.0977	0.0843	0.2930	0.3042
PEERADVI	0.1451	0.1013	0.0503	0.0227	0.1510
PEERWORK	0.1719	0.1887	0.0891	0.0541	0.1513
PEERSOCI	0.2402	0.1578	0.0780	0.1269	0.3553
PEERINFO	0.1748	0.1630	0.2189	0.2064	0.1946
PEERFAMI	0.1204	0.0777	0.1433	0.2144	0.2203
PEERVALU	0.0447	0.1574	0.1378	0.2252	0.1748
PEERETHN	-0.0190	0.0297	0.1975	0.1407	0.1467
FACRESEA	0.2227	0.1385	0.1512	0.0218	-0.0424
FACOURSE	0.1238	-0.0268	0.0317	-0.0992	-0.0242
FACPROFE	0.1563	0.0971	0.1328	0.0246	0.0927
FACDISCI	0.2256	0.0866	0.0932	0.0389	0.0758
FACPROGR	0.1876	0.1474	0.1297	0.0717	0.1464
FACOTHER	0.2433	0.2363	0.1268	0.1318	0.1217
FACGRANT	0.1747	0.2511	0.1752	0.1077	0.0026
FACLIFE	0.1359	0.2118	0.1456	0.0559	-0.0202
FACINSTI	0.0984	0.1339	0.0428	0.0379	0.0180
FACDEPAR	0.1752	0.2726	0.0084	0.0782	0.0394

	TEACLASS	SOCDEPAR	SOCASSOC	SOCPERFO	SOCSPORT
TEACLASS	1.0000				
SOCDEPAR	0.3355	1.0000			
SOCASSOC	0.2348	0.3467	1.0000		

Appendix H Continued					
SOCPERFO	0.2539	0.2276	0.2251	1.0000	
SOCSPORT	0.1209	0.2537	0.1882	0.3671	1.0000
SOCCONCE	0.2368	0.1860	0.2357	0.4822	0.3608
SOCINTER	-0.0868	-0.1294	0.0768	-0.0737	0.1661
SOCLUBS	0.0412	0.1421	0.2867	0.0508	0.1016
SOCSPIRT	-0.0633	0.0940	0.0150	-0.0742	0.0926
INSTTRIP	0.0795	0.0075	0.1387	0.0347	0.2260
INSTCARE	0.1782	0.1768	0.0188	0.2327	0.1525
INSTPROF	0.3049	0.2844	0.2074	0.1278	0.1775
INSTADMI	0.2174	0.2697	0.1269	0.0407	0.2074
INSTUDEN	0.2972	0.2633	0.1963	0.2457	0.1404
INSTEDUC	0.1536	0.1591	-0.0440	0.1909	0.1383
INSTGOVE	0.0766	0.2105	0.1762	0.2351	0.2104
PROFMEET	0.4329	0.4139	0.1921	0.2359	0.3244
PROFCONS	-0.0070	0.1642	-0.0215	-0.0176	0.1088
PROFEXTE	0.1911	0.2273	0.0123	0.1878	0.1682
PROFRESE	0.1025	0.2022	0.0160	0.1595	0.2806
PROTEACH	0.2797	0.1058	-0.0076	0.1509	0.2064
PROPUBLI	0.3163	0.2477	0.0992	0.1678	0.3845
PEERSTUD	0.3121	0.3802	0.1757	0.3679	0.2552
PEEREVEN	0.1542	0.1607	-0.0178	0.1812	0.1421
PEERESEA	0.3638	0.3179	0.1710	0.3520	0.1382
PEERTEAC	0.4837	0.3229	0.2312	0.3419	0.1863
PEERADVI	0.1745	0.2075	0.2047	0.1850	0.0548
PEERWORK	0.2341	0.2491	0.1811	0.1692	0.1326
PEERSOCI	0.4043	0.7950	0.3875	0.2438	0.2766
PEERINFO	0.3502	0.5105	0.3755	0.2634	0.3031
PEERFAMI	0.2779	0.5066	0.2193	0.3054	0.3035
PEERVALU	0.2471	0.4546	0.2279	0.2635	0.3590
PEERETHN	0.4055	0.3962	0.1469	0.3422	0.3452
FACRESEA	0.0922	0.2597	0.1024	0.1942	0.1444
FACOURSE	0.1103	0.1496	0.1732	0.0457	0.1382
FACPROFE	0.1726	0.1328	0.0142	0.1801	0.1830
FACDISCI	0.1332	0.2155	0.0281	0.1675	0.0936
FACPROGR	0.2180	0.2726	0.2868	0.1993	0.1562
FACOTHER	0.2452	0.3270	0.1219	0.3922	0.2239
FACGRANT	0.0169	0.2021	-0.0935	0.1519	0.1423
FACLIFE	0.0547	0.1546	0.1096	0.2356	0.1681
FACINSTI	0.0886	0.2127	0.1498	0.1963	0.1838
FACDEPAR	0.1269	0.3482	0.1406	0.2016	0.1920

Appendix H Continued					
	SOCCONCE	SOCINTER	SOCLUBS	SOCSPIRT	INSTTRIP
SOCCONCE	1.0000				
SOCINTER	0.2339	1.0000			
SOCLUBS	0.0231	0.1273	1.0000		
SOCSPIRT	-0.1273	0.0889	0.1134	1.0000	
INSTTRIP	-0.0258	0.0840	0.0202	0.2202	1.0000
INSTCARE	-0.0401	-0.0062	-0.0099	-0.0035	0.2511
INSTPROF	0.0476	-0.0989	0.0166	-0.1003	0.0366
INSTADMI	0.1218	-0.0127	0.0671	-0.0331	0.1728
INSTUDEN	0.2406	0.1066	0.0861	-0.0383	0.2371
INSTEDUC	0.1256	0.0290	0.0254	-0.0794	0.0499
INSTGOVE	0.0914	0.0735	0.1197	0.0050	0.1678
PROFMEET	0.1311	-0.0617	0.1280	0.0302	0.1999
PROFCONS	0.0103	0.0618	-0.0161	0.1111	0.2532
PROFEXTE	0.1517	0.0238	0.0727	0.1639	0.1239
PROFRESE	0.0593	-0.1078	-0.0688	-0.1001	0.1835
PROTEACH	0.0236	-0.1090	0.1371	0.1568	0.1946
PROPUBLI	0.1435	-0.0485	0.0307	-0.0649	0.2763
PEERSTUD	0.0907	-0.1311	0.1094	0.0643	-0.0132
PEEREVEN	0.0952	0.0038	-0.0979	-0.0383	-0.0045
PEERESEA	0.0751	-0.1573	0.0536	-0.0929	0.0077
PEERTEAC	0.1517	-0.0627	0.0297	-0.0763	0.0735
PEERADVI	0.0051	0.0718	0.0370	0.0073	0.0148
PEERWORK	0.0892	0.0233	-0.0077	-0.0538	0.0612
PEERSOCI	0.1976	-0.0600	0.1886	0.1229	0.0800
PEERINFO	0.1987	0.0671	0.1994	0.0825	0.0904
PEERFAMI	0.1383	-0.2355	0.1174	-0.0536	-0.0432
PEERVALU	0.0979	-0.2187	0.1653	0.0469	-0.0049
PEERETHN	0.2728	-0.1362	0.1054	-0.1363	-0.1328
FACRESEA	0.1031	-0.1144	-0.0736	-0.1282	0.0590
FACOURSE	-0.0712	0.0356	-0.0389	0.0190	0.0760
FACPROFE	-0.0344	0.0168	-0.1800	-0.0452	0.0850
FACDISCI	-0.0656	-0.1551	-0.2437	-0.0245	0.0682
FACPROGR	0.0201	-0.0970	0.0229	0.0407	0.1245
FACOTHER	0.1089	-0.1522	-0.1512	-0.1084	0.0856
FACGRANT	-0.0113	-0.0628	-0.1724	-0.0685	-0.0296
FACLIFE	0.0850	-0.0987	-0.0931	0.0332	-0.0479
FACINSTI	0.0578	-0.0289	-0.1426	-0.1123	0.0320
FACDEPAR	0.0095	-0.1142	-0.1402	-0.1515	-0.0294

Appendix H Continued					
	INSTCARE	INSTPROF	INSTADMI	INSTUDEN	INSTEDUC
INSTCARE	1.0000				
INSTPROF	0.4864	1.0000			
INSTADMI	0.3575	0.4269	1.0000		
INSTUDEN	0.4069	0.4609	0.4956	1.0000	
INSTEDUC	0.4438	0.4630	0.4099	0.5454	1.0000
INSTGOVE	0.1951	0.1660	0.1539	0.2817	0.1495
PROFMEET	0.2529	0.2288	0.2588	0.1990	0.1575
PROFCONS	-0.1037	-0.1070	-0.0140	0.0596	-0.0292
PROFEXTE	0.1256	0.2202	0.3183	0.3238	0.3945
PROFRESE	0.2038	0.1529	0.1542	0.1063	0.1162
PROTEACH	0.1935	0.3269	0.1575	0.2887	0.1563
PROPUBLI	0.2977	0.1951	0.1731	0.1770	0.0784
PEERSTUD	0.1191	0.2356	0.1926	0.1929	0.1200
PEEREVEN	0.0635	0.1083	0.0826	-0.0132	0.0177
PEERESEA	0.1818	0.2249	0.1173	0.2008	0.0971
PEERTEAC	0.1888	0.3259	0.2179	0.3072	0.1323
PEERADVI	-0.0545	0.1111	0.0885	0.0922	-0.0046
PEERWORK	0.1441	0.1421	0.0832	0.1754	-0.0195
PEERSOCI	0.2388	0.3147	0.2798	0.3252	0.2047
PEERINFO	0.1693	0.2380	0.1918	0.1251	0.0709
PEERFAMI	0.0789	0.2563	0.1703	0.0643	0.1225
PEERVALU	0.0937	0.1673	0.1740	0.0684	0.0467
PEERETHN	0.0541	0.1833	0.1261	0.0784	0.0567
FACRESEA	0.3138	0.0629	0.3146	0.2585	0.2290
FACOURSE	0.2744	0.1357	0.0955	0.1536	0.1340
FACPROFE	0.4654	0.3030	0.2828	0.4015	0.2508
FACDISCI	0.3807	0.2463	0.2636	0.3418	0.2637
FACPROGR	0.3693	0.2586	0.4039	0.3143	0.1779
FACOTHER	0.4098	0.2389	0.3867	0.3523	0.2578
FACGRANT	0.3054	0.1576	0.1925	0.1892	0.2372
FACLIFE	0.3290	0.1782	0.1742	0.1603	0.0577
FACINSTI	0.3411	0.2431	0.2075	0.2288	0.1720
FACDEPAR	0.2344	0.2343	0.2956	0.2106	0.1758

Appendix H Continued					
	INSTGOVE	PROFMEET	PROFCONS	PROFEXTE	PROFRESE
INSTGOVE	1.0000				
PROFMEET	0.2325	1.0000			
PROFCONS	0.1152	0.1785	1.0000		
PROFEXTE	0.3027	0.1805	0.2414	1.0000	
PROFRESE	0.0706	0.4138	0.1718	0.1645	1.0000
PROTEACH	0.1380	0.2307	0.0210	0.2306	0.3353
PROPUBLI	0.0631	0.4243	0.1229	0.0152	0.5632
PEERSTUD	0.1493	0.3786	0.0263	0.1205	0.1879
PEEREVEN	0.1093	0.2120	0.0885	0.0874	0.1674
PEERESEA	0.0040	0.3751	0.1709	0.1568	0.2239
PEERTEAC	0.1628	0.4441	0.0851	0.2412	0.2185
PEERADVI	0.0675	0.2187	0.0624	0.0856	0.1523
PEERWORK	0.1122	0.2713	0.0444	-0.0387	0.2024
PEERSOCI	0.2301	0.4424	0.1893	0.2499	0.1826
PEERINFO	0.1486	0.3601	0.1028	0.1997	0.2128
PEERFAMI	0.2210	0.2963	0.1217	0.1835	0.2529
PEERVALU	0.1436	0.3187	0.1258	0.0790	0.2189
PEERETHN	0.1176	0.2890	0.0553	0.0577	0.1614
FACRESEA	0.0299	0.2635	0.1464	0.0569	0.4543
FACOURSE	-0.1096	-0.0094	0.1130	-0.0340	0.0516
FACPROFE	0.0858	0.2369	0.1237	0.0654	0.1943
FACDISCI	0.0440	0.2318	0.1485	0.1293	0.2650
FACPROGR	0.0461	0.2733	0.0626	0.0921	0.2352
FACOTHER	0.1088	0.3398	0.1509	0.1683	0.2858
FACGRANT	0.0129	0.1071	0.0993	0.1616	0.2018
FACLIFE	0.0310	0.1202	-0.0892	0.0352	0.2115
FACINSTI	-0.0128	0.1539	0.0832	-0.0292	0.2536
FACDEPAR	0.0530	0.2152	0.1104	0.0520	0.3002

Appendix H Continued					
	PROTEACH	PROPUBLI	PEERSTUD	PEEREVEN	PEERESEA
PROTEACH	1.0000				
PROPUBLI	0.2213	1.0000			
PEERSTUD	0.2326	0.1073	1.0000		
PEEREVEN	0.1620	0.0859	0.4273	1.0000	
PEERESEA	0.1506	0.2320	0.4039	0.5841	1.0000
PEERTEAC	0.2898	0.1605	0.5196	0.5214	0.7665
PEERADVI	0.0694	0.0789	0.3376	0.5201	0.6101
PEERWORK	-0.0228	0.2334	0.3990	0.5065	0.5365
PEERSOCI	0.1484	0.2425	0.4429	0.3078	0.4822
PEERINFO	0.1967	0.2240	0.4687	0.4822	0.4803
PEERFAMI	0.1487	0.2489	0.4947	0.4637	0.4066
PEERVALU	0.1647	0.2529	0.4571	0.3383	0.3483
PEERETHN	0.2927	0.1881	0.4835	0.5023	0.3775
FACRESEA	0.0802	0.3768	0.1817	0.1567	0.2211
FACOURSE	-0.1362	0.2227	0.1323	0.1447	0.3006
FACPROFE	0.1204	0.2666	0.3205	0.1667	0.2462
FACDISCI	0.0405	0.2940	0.2213	0.2765	0.3426
FACPROGR	0.1187	0.2631	0.2371	0.3085	0.4213
FACOTHER	0.0925	0.3454	0.3695	0.2995	0.4716
FACGRANT	0.0582	0.2856	0.0932	0.1747	0.3308
FACLIFE	-0.0489	0.2347	0.2203	0.2238	0.2838
FACINSTI	0.0210	0.3121	0.2377	0.1664	0.2237
FACDEPAR	0.0404	0.3089	0.3396	0.1929	0.3139

	PEERTEAC	PEERADVI	PEERWORK	PEERSOCI	PEERINFO
PEERTEAC	1.0000				
PEERADVI	0.6025	1.0000			
PEERWORK	0.5766	0.7034	1.0000		
PEERSOCI	0.4815	0.3520	0.3897	1.0000	
PEERINFO	0.5095	0.4014	0.4891	0.6794	1.0000
PEERFAMI	0.4378	0.3618	0.4302	0.5884	0.5517
PEERVALU	0.3996	0.3125	0.4199	0.5772	0.5438
PEERETHN	0.3525	0.2434	0.2869	0.4972	0.4680
FACRESEA	0.1682	0.0781	0.1468	0.2515	0.1707
FACOURSE	0.1508	0.2155	0.2471	0.2887	0.1829
FACPROFE	0.2599	0.0438	0.1895	0.2360	0.1775
FACDISCI	0.2893	0.0611	0.2016	0.2912	0.2515
FACPROGR	0.2974	0.2370	0.2368	0.4217	0.3683

Appendix H Continued					
FACOTHER	0.3960	0.2806	0.3006	0.4577	0.3526
FACGRANT	0.2009	0.1472	0.1803	0.2672	0.2322
FACLIFE	0.2791	0.1854	0.2920	0.1735	0.2252
FACINSTI	0.1781	0.1971	0.2489	0.3058	0.2413
FACDEPAR	0.2806	0.2282	0.2031	0.3794	0.2542

	PEERFAMI	PEERVALU	PEERETHN	FACRESEA	FACOURSE
PEERFAMI	1.0000				
PEERVALU	0.8299	1.0000			
PEERETHN	0.6727	0.6380	1.0000		
FACRESEA	0.1458	0.1631	0.0706	1.0000	
FACOURSE	0.1059	0.1363	0.1143	0.4173	1.0000
FACPROFE	0.0617	0.1337	0.1958	0.4625	0.5323
FACDISCI	0.1385	0.1805	0.1254	0.5637	0.5899
FACPROGR	0.1860	0.2730	0.1933	0.5321	0.4968
FACOTHER	0.3485	0.3541	0.3078	0.5438	0.5102
FACGRANT	0.1710	0.1838	0.1451	0.4119	0.4220
FACLIFE	0.1258	0.1517	0.0925	0.4259	0.4663
FACINSTI	0.2062	0.2798	0.1384	0.5447	0.6295
FACDEPAR	0.3177	0.3168	0.2390	0.5170	0.5313

	FACPROFE	FACDISCI	FACPROGR	FACOTHER	FACGRANT
FACPROFE	1.0000				
FACDISCI	0.6861	1.0000			
FACPROGR	0.4237	0.5534	1.0000		
FACOTHER	0.6143	0.6878	0.6542	1.0000	
FACGRANT	0.4306	0.5820	0.4522	0.6591	1.0000
FACLIFE	0.4139	0.4958	0.5267	0.5063	0.3758
FACINSTI	0.5063	0.5735	0.4987	0.6398	0.5220
FACDEPAR	0.3742	0.5077	0.5060	0.6949	0.4654

	FACLIFE	FACINSTI	FACDEPAR		
FACLIFE	1.0000				
FACINSTI	0.5211	1.0000			
FACDEPAR	0.5124	0.7716	1.0000		

Appendix I
Communality of DSIQ's 58 Item Scale

Communalities	Initial	Extraction
Used the library regularly for research/papers etc...	1.000	0.714
Used computer facilities on campus for research etc...	1.000	0.647
Assist in bring speakers to campus	1.000	0.602
Request the library to subscribe to journal	1.000	0.771
Request the computing service to purchase software	1.000	0.717
Conducted research outside of course work	1.000	0.742
Attended research seminars in discipline	1.000	0.693
Attended interdisciplinary research seminars	1.000	0.749
Generated and used research data	1.000	0.636
Attended workshops or seminars on research ethics	1.000	0.754
Attended workshops on research administration	1.000	0.781
Reviewed papers for publication or presentation	1.000	0.705
Formally assessed your colleagues' teaching	1.000	0.784
Formally assessed your own teaching	1.000	0.646
Used the university's teaching development center	1.000	0.686
Observed classes taught by others to learn about teaching	1.000	0.714
Attended departmental social events	1.000	0.775
Attended graduate students associations socials	1.000	0.762
Attended a play, dance, etc... sponsored by institution	1.000	0.830
Attended sporting event sponsored by institutions	1.000	0.712
Attended a concert or other music event sponsored by institution	1.000	0.789
Participated in intramural athletics	1.000	0.748
Participated in campus clubs, student organizations, or government	1.000	0.713
Participated in activities to enhance your spirituality	1.000	0.800
Attended trips to other campuses to learn about other institutions/departments	1.000	0.695
Attended workshops on career development/opportunities	1.000	0.678
Attended workshops or seminars on roles and responsibilities of a professor	1.000	0.692
Attended workshops on research administration	1.000	0.692
Attended workshops or seminars on student development	1.000	0.736
Attended workshops on the mission and purpose of higher education	1.000	0.676
Served on committees to help craft policies, work on accreditation, engage in governance	1.000	0.725
Attended professional conferences or meeting	1.000	0.678
Participated in consulting projects not associated with your department or institutions	1.000	0.740
Participated in an outreach or extension project	1.000	0.653
Worked in a team on research	1.000	0.733
Worked in a team on teaching	1.000	0.707
Worked collaboratively on writing for publication	1.000	0.782
Met outside of class with other students on campus for a meeting, discussion, or study group	1.000	0.620
Met with fellow students to talk about current events	1.000	0.747
Met with fellow students to talk about your research	1.000	0.835
Met with fellow students to talk about teaching	1.000	0.828
Met with students to talk about faculty advisors	1.000	0.814

Appendix I Continued		
Met with student to talk about course work, plans of work, and faculty	1.000	0.713
Attended departmental social events with other fellow students	1.000	0.847
Attended informal dinners and get-together with other fellow students	1.000	0.695
Interacted with students whose race or ethnic background is different from yours	1.000	0.833
Interacted with students whose philosophy of life or personal values are different than yours	1.000	0.807
Interacted with students whose family background are different than yours	1.000	0.818
Your advisor's research	1.000	0.720
Course work	1.000	0.787
Professional organizations	1.000	0.760
Current events in your discipline	1.000	0.770
Your progress in the program	1.000	0.731
Professional relationships with others in your discipline	1.000	0.795
Applying and writing grants	1.000	0.687
Your personal life	1.000	0.647
Institutional events	1.000	0.742
Departmental events	1.000	0.717

Appendix J
Total Variance Explained and Eigenvalues of DSIQ's 58 Item Scale

Total Variance Explained						
	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	12.190	21.018	21.018	6.445	11.111	11.111
2	4.321	7.450	28.468	4.407	7.598	18.709
3	3.893	6.713	35.180	3.951	6.812	25.521
4	2.586	4.458	39.638	3.857	6.650	32.172
5	2.183	3.763	43.402	3.420	5.897	38.068
6	2.084	3.594	46.995	2.371	4.088	42.156
7	1.941	3.346	50.342	2.091	3.606	45.762
8	1.841	3.173	53.515	2.057	3.546	49.308
9	1.593	2.746	56.261	1.835	3.164	52.473
10	1.515	2.612	58.873	1.770	3.051	55.524
11	1.422	2.452	61.325	1.601	2.761	58.285
12	1.401	2.416	63.741	1.545	2.663	60.948
13	1.234	2.128	65.869	1.543	2.661	63.609
14	1.160	2.001	67.870	1.520	2.620	66.229
15	1.100	1.896	69.765	1.395	2.405	68.634
16	1.083	1.868	71.633	1.389	2.396	71.030
17	1.023	1.764	73.397	1.373	2.367	73.397
18	.990	1.707	75.104			
19	.926	1.596	76.700			
20	.903	1.557	78.257			
21	.811	1.398	79.655			
22	.790	1.363	81.018			
23	.746	1.286	82.304			
24	.711	1.226	83.529			
25	.625	1.077	84.607			
26	.590	1.018	85.624			
27	.570	.983	86.607			
28	.565	.974	87.581			
29	.544	.937	88.519			
30	.517	.892	89.411			
31	.468	.808	90.218			
32	.443	.763	90.982			
33	.438	.755	91.737			
34	.401	.692	92.429			
35	.374	.645	93.074			
36	.359	.618	93.692			
37	.310	.534	94.226			
38	.296	.511	94.737			
39	.278	.480	95.217			
40	.258	.445	95.661			
41	.249	.429	96.091			
42	.248	.427	96.518			
43	.224	.386	96.903			
44	.207	.357	97.260			
45	.198	.342	97.602			
46	.174	.299	97.902			
47	.160	.275	98.177			
48	.143	.246	98.422			
49	.141	.244	98.666			
50	.131	.227	98.893			
51	.126	.216	99.109			
52	.101	.174	99.283			
53	9.183E-02	.158	99.441			
54	8.082E-02	.139	99.581			
55	7.787E-02	.134	99.715			
56	7.097E-02	.122	99.837			
57	5.455E-02	9.404E-02	99.931			
58	3.975E-02	6.854E-02	100.000			

Appendix K
Factor Loading of DSIQ's 58 Item Scale

	Component				
	1	2	3	4	5
Professional relationships with others in your discipline	0.7683	-0.3028	-0.2587	-0.0846	0.0446
Attended departmental social events with other fellow students	0.7168	0.3139	0.0460	-0.0610	0.0439
Met with fellow students to talk about teaching	0.6496	0.3946	-0.0737	-0.2363	-0.2548
Your progress in the program	0.6424	-0.2623	-0.1880	-0.1183	-0.0528
Attended informal dinners and get-together with other fellow students	0.6396	0.4091	-0.0725	0.0108	-0.0170
Met with fellow students to talk about your research	0.6386	0.2786	-0.2408	-0.1256	-0.2494
Departmental events	0.6245	-0.3041	-0.3206	-0.0537	0.0784
Current events in your discipline	0.6056	-0.4838	-0.2424	-0.1560	-0.1179
Attended departmental social events	0.5885	0.2664	0.0949	0.0382	0.1036
Interacted with students whose race or ethnic background is different from yours	0.5861	0.4993	-0.1427	0.1063	0.0881
Institutional events	0.5814	-0.4157	-0.3760	-0.0587	0.1191
Attended professional conferences or meeting	0.5788	0.1733	0.2164	0.2550	-0.1538
Interacted with students whose philosophy of life or personal values are different than yours	0.5769	0.4286	-0.1590	0.1646	0.0991
Professional organizations	0.5526	-0.4246	-0.1517	-0.1872	0.0097
Your advisor's research	0.5504	-0.4455	-0.1981	0.1421	0.0730
Met outside of class with other students on campus for a meeting, discussion, or study group	0.5491	0.3635	-0.1396	-0.1250	0.0712
Worked collaboratively on writing for publication	0.5310	-0.1831	0.1052	0.5138	-0.0522
Applying and writing grants	0.5270	-0.4098	-0.2606	0.0068	0.0436
Attended research seminars in discipline	0.5189	-0.0483	0.2446	0.2305	0.0242
Met with student to talk about course work, plans of work, and faculty	0.5153	0.3336	-0.3154	-0.1001	-0.2236
Generated and used research data	0.5109	-0.1785	0.0257	0.3976	-0.0589
Interacted with students whose family background are different than yours	0.5069	0.4822	-0.1544	0.0544	0.2547
Attended workshops or seminars on student development	0.5014	-0.2046	0.4558	-0.3188	0.0781
Your personal life	0.4967	-0.3132	-0.3296	-0.1084	0.0072
Attended workshops on research administration	0.4925	-0.2014	0.3917	-0.2406	0.0176
Attended workshops on career development/opportunities	0.4852	-0.3647	0.2343	-0.1561	0.0156
Attended workshops or seminars on roles and responsibilities of a professor	0.4841	-0.0461	0.3373	-0.3074	-0.0170
Observed classes taught by others to learn about teaching	0.4841	0.2811	0.2518	-0.1268	0.0489
Met with fellow students to talk about current events	0.4551	0.3605	-0.3680	-0.0935	-0.2760
Course work	0.4479	-0.3876	-0.3958	-0.2071	-0.0273
Met with students to talk about faculty advisors	0.4387	0.3903	-0.3063	-0.1505	-0.2762
Attended sporting event sponsored by institutions	0.4315	0.1096	0.0954	0.4167	0.2084

Appendix K Continued					
Attended interdisciplinary research seminars	0.4104	-0.2058	0.3614	0.2220	0.1051
Request the computing service to purchase software	0.4033	0.0213	-0.0741	-0.0183	0.0781
Attended workshops or seminars on research ethics	0.3220	-0.1188	0.5634	-0.2880	0.0367
Attended workshops on research administration	0.3957	-0.1568	0.4508	-0.3090	-0.1051
Participated in an outreach or extension project	0.3105	0.0493	0.4179	-0.0632	-0.1388
Attended workshops on the mission and purpose of higher education	0.3640	-0.2632	0.3713	-0.1992	0.0962
Attended trips to other campuses to learn about other institutions/departments	0.1791	-0.1023	0.3260	0.2331	-0.2889
Worked in a team on research	0.4588	-0.1328	-0.0135	0.5434	-0.1686
Conducted research outside of course work	0.4283	-0.2354	0.1409	0.5130	-0.2599
Used the library regularly for research/papers etc...	0.0103	-0.2105	0.0515	0.1644	0.6291
Attended a concert or other music event sponsored by institution	0.2148	0.1979	0.1014	0.1451	0.5295
Attended a play, dance, etc... sponsored by institution	0.4337	0.1889	-0.0451	0.0692	0.4554
Used computer facilities on campus for research etc...	0.1173	0.1605	-0.2932	0.0765	0.3490
Reviewed papers for publication or presentation	0.3109	-0.1214	0.1449	0.2163	-0.0092
Formally assessed your colleagues' teaching	0.1685	0.0361	-0.1048	0.0111	0.2089
Participated in intramural athletics	-0.1026	0.0076	0.1034	-0.0630	0.0971
Attended graduate students associations socials	0.2995	0.2718	0.0688	-0.1179	0.2407
Participated in activities to enhance your spirituality	-0.0432	0.0576	0.1231	0.1147	-0.1960
Assist in bring speakers to campus	0.3366	-0.0957	0.3260	0.0782	-0.0286
Worked in a team on teaching	0.3104	0.1189	0.3195	0.1737	-0.0959
Request the library to subscribe to journal	0.1518	-0.1261	-0.0796	-0.0394	0.2461
Formally assessed your own teaching	0.2461	0.1909	0.1917	-0.2181	0.1691
Used the university's teaching development center	0.3436	0.2132	0.3839	-0.1925	-0.1265
Participated in campus clubs, student organizations, or government	0.0589	0.2825	0.3499	0.0552	0.1213
Participated in consulting projects not associated with your department or institutions	0.1679	0.0080	-0.0185	0.3056	-0.3114
Served on committees to help craft policies, work on accreditation, engage in governance	0.2542	0.1502	0.3064	0.0044	-0.0557
Extraction Method: Principal Component Analysis. 17 components extracted.					

Appendix K Continued	Component				
	6	7	8	9	10
Professional relationships with others in your discipline	0.0391	-0.0717	-0.0639	0.0408	0.0823
Attended departmental social events with other fellow students	0.0297	0.1580	-0.3470	0.1271	-0.0297
Met with fellow students to talk about teaching	0.0078	-0.0632	0.2701	-0.1175	0.0829
Your progress in the program	-0.0024	0.1063	-0.1859	-0.1038	0.0937
Attended informal dinners and get-together with other fellow students	-0.0397	0.1602	-0.1179	0.0277	0.0700
Met with fellow students to talk about your research	-0.0441	-0.0468	0.1856	-0.1247	0.1283
Departmental events	-0.0201	-0.0165	-0.1928	0.0897	-0.0506
Current events in your discipline	0.0743	-0.0798	-0.1101	-0.0480	0.0280
Attended departmental social events	0.0184	0.0722	-0.3960	0.1979	-0.0344
Interacted with students whose race or ethnic background is different from yours	-0.0152	-0.2129	-0.2341	0.1481	-0.1247
Institutional events	0.0321	0.0863	-0.1086	-0.0884	-0.0458
Attended professional conferences or meeting	-0.1581	-0.0090	0.0156	-0.0697	0.1293
Interacted with students whose philosophy of life or personal values are different than yours	-0.0746	-0.1222	-0.3228	0.0649	-0.1181
Professional organizations	0.1118	-0.0109	0.0512	-0.1281	-0.0650
Your advisor's research	-0.0071	-0.0207	-0.0318	0.0209	0.0928
Met outside of class with other students on campus for a meeting, discussion, or study group	0.0527	-0.1051	-0.0545	-0.0268	-0.1712
Worked collaboratively on writing for publication	-0.1824	0.0498	0.1095	-0.1945	-0.0337
Applying and writing grants	-0.0315	-0.0707	0.0241	0.2638	0.0408
Attended research seminars in discipline	-0.2080	0.0893	0.1148	-0.2222	0.1171
Met with student to talk about course work, plans of work, and faculty	-0.0948	0.2281	0.2857	0.0190	-0.0191
Generated and used research data	-0.1001	-0.1646	0.1721	0.0822	-0.0121
Interacted with students whose family background are different than yours	-0.0076	-0.2562	-0.1002	-0.0473	-0.1421
Attended workshops or seminars on student development	0.2648	0.0509	0.1163	-0.0370	-0.0163
Your personal life	-0.0651	0.0794	0.0092	-0.1585	0.0726
Attended workshops on research administration	-0.0083	-0.0197	-0.0346	0.2030	-0.0239
Attended workshops on career development/opportunities	0.0038	-0.0541	0.0598	-0.2522	-0.1091
Attended workshops or seminars on roles and responsibilities of a professor	0.0747	-0.2123	0.0125	-0.0886	-0.2234
Observed classes taught by others to learn about teaching	-0.1742	-0.1114	0.0855	-0.2468	0.0907
Met with fellow students to talk about current events	0.1139	-0.1129	0.2360	0.0318	-0.0066
Course work	0.0482	0.2855	-0.1951	-0.2180	0.0098
Met with students to talk about faculty advisors	-0.0165	0.2475	0.3199	0.1343	-0.0503
Attended sporting event sponsored by institutions	0.3328	0.1030	0.0388	-0.1071	0.0395
Attended interdisciplinary research seminars	-0.2017	0.1872	0.0570	-0.1600	-0.1971
Request the computing service to purchase software	0.2138	0.1155	0.2151	0.4012	-0.1638
Attended workshops or seminars on research ethics	-0.2362	0.0167	0.0437	-0.0575	-0.1224

Appendix K Continued					
Attended workshops on research administration	-0.2771	0.1973	0.1136	0.2376	0.0087
Participated in an outreach or extension project	0.3999	-0.1296	-0.0288	0.2378	0.1288
Attended workshops on the mission and purpose of higher education	0.2798	-0.3033	0.0402	0.0764	0.0445
Attended trips to other campuses to learn about other institutions/departments	0.1577	0.3204	0.0242	-0.1209	0.1072
Worked in a team on research	0.0279	-0.1453	0.1867	0.0048	-0.1584
Conducted research outside of course work	0.0807	-0.1184	0.0189	0.0303	0.1799
Used the library regularly for research/papers etc...	-0.0430	0.0330	0.0016	0.1995	-0.1229
Attended a concert or other music event sponsored by institution	0.2864	0.0256	0.2297	-0.1105	0.3607
Attended a play, dance, etc... sponsored by institution	0.3041	-0.1146	0.1867	-0.2487	0.1082
Used computer facilities on campus for research etc...	-0.0438	0.2314	0.3114	0.1387	-0.1422
Reviewed papers for publication or presentation	-0.5638	0.1505	0.0544	0.2156	-0.0693
Formally assessed your colleagues' teaching	-0.5469	-0.0409	0.1039	0.1674	0.3267
Participated in intramural athletics	0.2614	0.5378	0.3094	0.1002	0.2716
Attended graduate students associations socials	0.0188	0.4390	-0.2370	-0.2163	0.1029
Participated in activities to enhance your spirituality	0.2003	0.4078	-0.2604	0.0345	-0.2796
Assist in bring speakers to campus	-0.0435	-0.0484	-0.1432	0.4044	0.2504
Worked in a team on teaching	0.1368	-0.1971	0.1908	-0.1427	-0.4903
Request the library to subscribe to journal	0.0350	0.2631	0.3474	0.2978	-0.3783
Formally assessed your own teaching	-0.2057	-0.2614	0.0890	0.0691	0.3670
Used the university's teaching development center	-0.1472	0.0507	-0.0326	0.0276	-0.0281
Participated in campus clubs, student organizations, or government	-0.1703	0.3244	-0.2355	-0.2457	-0.0441
Participated in consulting projects not associated with your department or institutions	0.3112	0.1332	-0.2059	0.2060	0.2314
Served on committees to help craft policies, work on accreditation, engage in governance	0.2944	0.0303	-0.0295	0.1138	0.0358
Extraction Method: Principal Component Analysis. 17 components extracted.					

Appendix K Continued

	Component				
	11	12	13	14	15
Professional relationships with others in your discipline	0.0855	0.0416	-0.0164	0.0800	-0.0087
Attended departmental social events with other fellow students	0.0442	0.0445	-0.0986	-0.1187	-0.1073
Met with fellow students to talk about teaching	0.0465	0.0350	-0.0805	0.1037	-0.0478
Your progress in the program	-0.0072	-0.0119	0.0627	0.1385	0.0182
Attended informal dinners and get-together with other fellow students	-0.0796	0.0974	0.1445	-0.0993	0.0297
Met with fellow students to talk about your research	0.0057	0.2373	-0.2397	0.1252	0.0604
Departmental events	-0.0444	-0.1894	-0.1355	0.0847	-0.0129
Current events in your discipline	0.1247	0.1304	0.0168	-0.0952	-0.0442
Attended departmental social events	0.0877	-0.0900	-0.1198	-0.0804	-0.1944
Interacted with students whose race or ethnic background is different from yours	-0.1542	-0.0320	0.0255	-0.0731	0.1248
Institutional events	-0.0302	-0.1374	-0.0562	-0.0225	0.0468
Attended professional conferences or meeting	0.2365	-0.0717	0.0820	-0.0271	-0.2183
Interacted with students whose philosophy of life or personal values are different than yours	-0.0963	-0.0061	0.0848	-0.0507	0.2157
Professional organizations	0.1981	0.0941	0.2186	-0.1624	-0.1080
Your advisor's research	-0.1062	-0.0310	-0.0476	0.0611	-0.3306
Met outside of class with other students on campus for a meeting, discussion, or study group	0.0796	0.0683	0.2025	0.1213	-0.1615
Worked collaboratively on writing for publication	0.0577	-0.1907	-0.1000	-0.2118	0.0705
Applying and writing grants	0.0241	0.1995	0.0092	0.0343	0.1884
Attended research seminars in discipline	0.0905	0.1996	-0.2132	-0.0060	0.2823
Met with student to talk about course work, plans of work, and faculty	-0.1024	-0.1078	-0.0137	0.0175	0.0676
Generated and used research data	-0.3097	-0.0760	-0.0181	0.0075	-0.0724
Interacted with students whose family background are different than yours	-0.0505	0.1190	0.1065	-0.2453	-0.0534
Attended workshops or seminars on student development	-0.0625	-0.0201	-0.0960	0.0620	-0.1241
Your personal life	-0.0676	-0.0860	0.1816	0.1531	0.1101
Attended workshops on research administration	-0.1844	-0.1624	0.0566	-0.0968	-0.0049
Attended workshops on career development/opportunities	0.0859	0.0175	0.3245	0.0258	0.0564
Attended workshops or seminars on roles and responsibilities of a professor	0.0193	-0.2971	0.0263	-0.0269	0.1963
Observed classes taught by others to learn about teaching	0.3082	0.0009	-0.1847	-0.1865	-0.1456
Met with fellow students to talk about current events	-0.1824	0.1614	0.1661	-0.1077	-0.0159
Course work	-0.0572	0.1029	-0.0808	-0.1660	0.0574
Met with students to talk about faculty advisors	-0.1536	-0.0197	-0.1807	0.1347	0.0764
Attended sporting event sponsored by institutions	-0.0645	-0.1146	0.2276	-0.1492	0.2353
Attended interdisciplinary research seminars	-0.1010	0.3079	-0.1496	0.0501	0.1245
Request the computing service to purchase software	0.1333	-0.2499	-0.0764	-0.0162	0.3077
Attended workshops or seminars on	-0.2093	0.2240	-0.0699	-0.1443	-0.1533

Appendix K Continued					
Attended workshops on research administration	-0.2767	-0.0205	-0.0545	-0.0772	-0.0346
Participated in an outreach or extension project	-0.0658	0.2665	-0.0710	0.0491	0.0138
Attended workshops on the mission and purpose of higher education	-0.2566	0.0714	0.0478	0.0093	0.0084
Attended trips to other campuses to learn about other institutions/departments	0.1948	0.0093	0.1965	0.1974	-0.0004
Worked in a team on research	-0.0721	-0.1706	-0.0531	0.0506	-0.2274
Conducted research outside of course work	-0.0896	-0.0231	-0.0123	-0.0935	0.1598
Used the library regularly for research/papers etc...	0.0604	0.2049	-0.1765	0.1114	0.1065
Attended a concert or other music event sponsored by institution	-0.0987	-0.0703	-0.1232	-0.1967	-0.1161
Attended a play, dance, etc... sponsored by institution	0.1850	0.0664	-0.0377	0.3045	0.0394
Used computer facilities on campus for research etc...	-0.0108	0.1372	0.1512	0.2452	-0.2387
Reviewed papers for publication or presentation	0.0393	-0.1919	0.1585	0.2055	-0.0358
Formally assessed your colleagues' teaching	0.0842	0.1886	0.3825	-0.1973	-0.1126
Participated in intramural athletics	-0.1013	-0.0347	0.2351	-0.3266	0.0383
Attended graduate students associations socials	-0.0308	-0.3434	-0.1052	0.2036	-0.1328
Participated in activities to enhance your spirituality	0.2119	0.3226	0.2441	-0.0010	0.1235
Assist in bring speakers to campus	0.1650	0.1013	0.0577	0.2605	-0.0017
Worked in a team on teaching	0.0657	0.1202	0.1042	0.0863	-0.1165
Request the library to subscribe to journal	0.2990	0.0836	-0.1470	-0.1511	-0.0654
Formally assessed your own teaching	0.1748	0.0293	0.0787	0.1985	0.2721
Used the university's teaching development center	0.4384	-0.2300	-0.0919	-0.1501	0.1098
Participated in campus clubs, student organizations, or government	-0.3969	0.1913	0.0105	0.1848	0.0741
Participated in consulting projects not associated with your department or institutions	0.1267	0.2261	-0.2322	-0.0349	-0.1735
Served on committees to help craft policies, work on accreditation, engage in governance	-0.0481	-0.2388	0.2542	0.1942	-0.1018
Extraction Method: Principal Component Analysis. 17 components extracted.					

Appendix K Continued	Component				
	16	17			
Professional relationships with others in your discipline	0.0296	-0.0381			
Attended departmental social events with other fellow students	-0.1409	-0.0636			
Met with fellow students to talk about teaching	-0.0548	0.0261			
Your progress in the program	-0.0938	0.3157			
Attended informal dinners and get-together with other fellow students	-0.1271	0.0502			
Met with fellow students to talk about your research	-0.0844	0.0470			
Departmental events	0.0601	-0.0849			
Current events in your discipline	0.0254	-0.0257			
Attended departmental social events	-0.2211	-0.1020			
Interacted with students whose race or ethnic background is different from yours	0.1025	-0.0764			
Institutional events	0.0981	-0.0838			
Attended professional conferences or meeting	-0.1166	-0.0230			
Interacted with students whose philosophy of life or personal values are different than yours	0.1392	0.0034			
Professional organizations	0.2118	-0.0395			
Your advisor's research	-0.0161	0.1229			
Met outside of class with other students on campus for a meeting, discussion, or study group	0.0385	0.0702			
Worked collaboratively on writing for publication	0.0509	0.0059			
Applying and writing grants	-0.0367	-0.1229			
Attended research seminars in discipline	0.0428	-0.0704			
Met with student to talk about course work, plans of work, and faculty	-0.0314	-0.0747			
Generated and used research data	0.0107	0.0070			
Interacted with students whose family background are different than yours	0.2185	-0.0025			
Attended workshops or seminars on student development	0.0735	0.0411			
Your personal life	-0.2345	-0.0741			
Attended workshops on research administration	0.0130	0.2847			
Attended workshops on career development/opportunities	-0.1039	-0.1418			
Attended workshops or seminars on roles and responsibilities of a professor	-0.0568	0.0782			
Observed classes taught by others to learn about teaching	0.0341	0.1171			
Met with fellow students to talk about current events	0.0590	0.0683			
Course work	0.1158	-0.0356			
Met with students to talk about faculty advisors	-0.0916	0.0567			
Attended sporting event sponsored by institutions	0.0678	0.0037			
Attended interdisciplinary research seminars	0.1303	-0.2040			
Request the computing service to purchase software	0.1803	0.1888			
Attended workshops or seminars on	0.0610	-0.1058			

Appendix K Continued					
Attended workshops on research administration	0.1323	0.0184			
Participated in an outreach or extension project	-0.1291	-0.0784			
Attended workshops on the mission and purpose of higher education	-0.1798	0.0425			
Attended trips to other campuses to learn about other institutions/departments	0.3165	0.1959			
Worked in a team on research	-0.0665	0.0569			
Conducted research outside of course work	-0.2331	0.0263			
Used the library regularly for research/papers etc...	0.0152	0.2932			
Attended a concert or other music event sponsored by institution	-0.1705	0.0591			
Attended a play, dance, etc... sponsored by institution	-0.1355	-0.1592			
Used computer facilities on campus for research etc...	0.2075	-0.0078			
Reviewed papers for publication or presentation	-0.1135	-0.1052			
Formally assessed your colleagues' teaching	-0.0582	0.0979			
Participated in intramural athletics	0.0300	-0.0256			
Attended graduate students associations socials	0.0211	0.1601			
Participated in activities to enhance your spirituality	-0.3468	0.1751			
Assist in bring speakers to campus	0.0473	0.0691			
Worked in a team on teaching	0.0715	0.2117			
Request the library to subscribe to journal	-0.2200	-0.2161			
Formally assessed your own teaching	0.1624	-0.0131			
Used the university's teaching development center	0.0387	-0.0760			
Participated in campus clubs, student organizations, or government	0.0120	-0.0580			
Participated in consulting projects not associated with your department or institutions	0.3328	-0.0718			
Served on committees to help craft policies, work on accreditation, engage in governance	0.1120	-0.5039			
Extraction Method: Principal Component Analysis. 17 components extracted.					

Appendix L

Total Variance Explained and Eigenvalues of DSIQ's 58 Item Scale Restricted to Four Factors

Total Variance Explained						
	Initial Eigenvalues			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	12.190	21.018	21.018	7.236	12.476	12.476
2	4.321	7.450	28.468	6.359	10.964	23.441
3	3.893	6.713	35.180	5.092	8.779	32.219
4	2.586	4.458	39.638	4.303	7.419	39.638
5	2.183	3.763	43.402			
6	2.084	3.594	46.995			
7	1.941	3.346	50.342			
8	1.841	3.173	53.515			
9	1.593	2.746	56.261			
10	1.515	2.612	58.873			
11	1.422	2.452	61.325			
12	1.401	2.416	63.741			
13	1.234	2.128	65.869			
14	1.160	2.001	67.870			
15	1.100	1.896	69.765			
16	1.083	1.868	71.633			
17	1.023	1.764	73.397			
18	.990	1.707	75.104			
19	.926	1.596	76.700			
20	.903	1.557	78.257			
21	.811	1.398	79.655			
22	.790	1.363	81.018			
23	.746	1.286	82.304			
24	.711	1.226	83.529			
25	.625	1.077	84.607			
26	.590	1.018	85.624			
27	.570	.983	86.607			
28	.565	.974	87.581			
29	.544	.937	88.519			
30	.517	.892	89.411			
31	.468	.808	90.218			
32	.443	.763	90.982			
33	.438	.755	91.737			
34	.401	.692	92.429			
35	.374	.645	93.074			
36	.359	.618	93.692			
37	.310	.534	94.226			
38	.296	.511	94.737			
39	.278	.480	95.217			
40	.258	.445	95.661			
41	.249	.429	96.091			
42	.248	.427	96.518			
43	.224	.386	96.903			
44	.207	.357	97.260			
45	.198	.342	97.602			
46	.174	.299	97.902			
47	.160	.275	98.177			
48	.143	.246	98.422			
49	.141	.244	98.666			
50	.131	.227	98.893			
51	.126	.216	99.109			
52	.101	.174	99.283			
53	9.183E-	.158	99.441			
54	8.082E-	.139	99.581			
55	7.787E-	.134	99.715			
56	7.097E-	.122	99.837			
57	5.455E-	9.404E-02	99.931			
58	3.975E-	6.854E-02	100.000			