THE RELATIONSHIP OF ENVIRONMENTAL PREDICTORS AND INSTITUTIONAL CHARACTERISTICS TO STUDENT PERSISTENCE

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
Doctor of Philosophy
May, 1999

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AND INSTITUTIONAL CHARACTERISTICS TO

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ACKNOWLEDGMENTS

Anyone who has gone through this process of completing a graduate degree understands that if you are fortunate, you are not in this alone. Even though the ultimate responsibility to finish rests on our shoulders, a support network is there to aid and guide in the process. I am blessed with having had a group of people who believed in me, supported, gave advice, and encouraged me to "persist" toward the completion of this degree.

I wish to express my sincere gratitude to Dr. Marcia Dickman, my major advisor, over the past 10 years, for her gentle and wise guidance, understanding, patience, and friendship that has helped in bringing me through this educational process and to a new level of professionalism. My appreciation goes to Dr. Dale Fuqua, the chair of my committee, for providing tremendous advice in the process of statistical analysis. Also, to my other committee members Dr. Ronald Beer, Dr. James Seals, and Dr. Tom Coombs, whose guidance, assistance, encouragement, and support are invaluable. A special thanks to Pam Bowers and Carla Reichard, my graduate companions, who have been continual supporters through the years.

I want to express my heart felt gratitude to my husband, Don, who has gently nudged me over the years and when I hit the walls he has always said, "Keep on going." Even in his own struggles, he has provided a way for me to commit the time needed to finish my degree. Also, to my five year old son, Nathan, who has only known a mother

who was off to school or doing her "homework," thank you for being so wonderful and a joy to be with. You both have lightened the load with your love in my life.

To my parents, John and Sally Taylor, who have always believed that I could hang the moon if I wanted to. You laid the groundwork many years ago for my success today.

A final thanks goes to my friends at Pioneer Bible Church in Ponca City, Oklahoma who held me up during hard times and provided support whenever it was needed. God gives wonderful friends like you to a person once in a life time.

Proverbs 3:6 says, "In all your ways acknowledge Him, and He will make your paths straight." God is the heart of my life and the rhythm, harmony, and melody to my song.

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CHAPTER I

INTRODUCTION

A college or university setting is an environmental system that significantly affects the personal and academic development of the student and either supports a student's progress or presents barriers to achieving academic goals (Strange, 1994). As an interactive organism, higher educational institutions can greatly impact a student in their quest for knowledge and maturity. Fuqua and Kurpius (1993), stated that, "human organizations are potentially very complex systems operating in even more complex environments" (p. 607). The higher educational system can be described as one that provides certain complex aspects and characteristics that affect its students and that complexity must be interpreted within an environmental context. It appears reasonable, if one assumes a systems' perspective, to expect that the characteristics of the complex institutional milieu would also impact retention and attrition. Astin (1975) has concluded that a student's chances of persisting toward a college degree can be significantly influenced by environmental circumstances. Beil and Shope (1990) also stated that "...although the characteristics of the students are important, what happens after they enroll in the college appears to have a greater impact on persistence." (p.11). The college experience is significant for students. It affects students and can be a supportive environment that is necessary for a maturing and productive process.

This current study examines the higher education institution as an environmental organization that can be described by such variables as (a) institutional classification, (b) institutional size, (c) level of wealth, (d) level of complexity and diversity of the student body, (e) campus location, and (f) quality and selectivity. The examination of these variables will provide a specific view of the university system and the basis for an

exploration of the relationship these variables have to retention. The higher education environment and its population have been the focus of much research since the inception of post-secondary education (Astin, 1971; Chickering, 1969; Pascarella & Terenzini, 1991). Over the past four decades, our higher education system has experienced dramatic change. Institutions of learning have moved from isolated environments for students to acquire knowledge to more "complex and multifaceted institutions serving all ages and a variety of new constituencies" (Parnell, 1990, p. 7). Smith (1993) stated that today's institutions of higher education are not "ivory towers", but rather are an integral part of the larger community. Birmbaum (1988) observed that, as colleges and universities expand and interact with other systems, their mission becomes unclear and they become sources of conflict and stress. Society is demanding that postsecondary education be more accountable for efficient use of resources in the preparation of students (Hartman & Schmidt, 1995; Sanders & Burton, 1996; Schroeder & Hurst, 1996; Terenzini, 1989; Volkein & Lorang, 1996). Due to the number of people they affect, the financial commitment required, and the personal and societal impact they make, institutions of higher education are closely scrutinized (Nordvall & Braxton, 1996). The financial and societal impact that higher education has on our communities and the nation require effective use of the institution's revenues and assets in producing well-developed individuals. (Tierney, 1992). The stakes are high when referring to our higher education system in the United States and this study will continue the attention needed on the organization's effectiveness in regards to the support given to the students.

The impact of the higher educational experience has been found to be multifaceted. One area that has received much attention has been the traditional-aged college student and his/her development through the process of education. Research professionals have examined the traditional-aged college student in almost every area of their personal

characteristics and campus life such as student development, psychosocial influence, and expectations (Astin, 1971, 1975; Bean 1980; Chickering, 1969; Cope & Hannah, 1975; Tinto, 1975).

Essential components of a successful student and the environment that he or she inhabits has been researched extensively (Astin, 1975; Bean & Bradley, 1984; Dey & Hurtado, 1995; Pascarella & Terenzini, 1991). Upon entering college, a student brings a host of distinguishing individual traits and attitudes that are unique to each individual. Research in this area includes the study of student's gender, ethnic background, age, school classification, familial patterns, socioeconomic standing, level of personal development, personal expectancies, career decisiveness, current grade point averages, and level of financial aid acquired. However, variables specific to the institution as a system have been explored with much less vigor. As the student begins to interact with the higher education system, he or she is either encouraged and challenged to persist toward graduation or he/she encounters problems and discontinues the pursuit of academic goals. Often, the issues seem insurmountable to the student and become a source of attrition as the student perceives these issues as "problems with the system". The institutional system has the power to be friendly and supportive or one that creates undo dilemmas and hurdles that cause discouragement and failure. This study attempts to expand our understanding of the institutional system's variables and their relationship to student persistence.

One area that has received attention over the past twenty to thirty years is the institution's approach concerning student retention and how it affects a student's persistence toward graduation (Astin, 1975; Bean, 1980; Spady, 1970; Tinto, 1975). Astin, Korn, and Green (1987) stated that student retention and student satisfaction are viewed broadly as relating to institutional performance and student outcomes.

Improvements in the area of the retention of college students is critical from three positions; "the student will be able to reap the rewards that a college degree affords, the college or university will be able to maintain the income that derives from the student's attendance, and society will be able to utilize the skills of students in becoming more productive" (Tierney, 1992, p. 604). As institutions work toward improving the retention of their students, beneficial outcomes can be seen on all levels.

Nora, Cabrera, Hagedorn, and Pascarella (1996) observed that college student persistence has become one of the most important criteria upon which success in a higher education institution is rated. Institutions are being judged based on "learning productivity, retention, and graduation rates" (Schroeder & Hurst, 1996, p. 177). Astin, Korn, and Green (1987) observed that retention rates and satisfaction data are seen as indicative of institutional effectiveness. Even though other measures are worthy of consideration in the assessment of effectiveness, typically a retention rate is used as an expeditious means to determine the capability of a university to retain its students.

To help explain the phenomenon of college student attrition, researchers have extensively looked at the characteristics of the individual student to understand why success in the academic environment is not always achieved (Astin, 1971, 1975; Bean, 1980; Chickering, 1969; Chickering, 1974; Cope & Hannah, 1975; Tinto, 1975). A large body of research has been conducted in relation to a student's individual characteristics and personal development to suggest possible variables that assist in explaining attrition. These variables have included, but are not limited to, high school grade point average (Dey, 1990), college grade point average, familial and socio-economic background (Schultheiss & Blustein, 1994), ethnic orientations (Nora, Cabrera, Hagedorm, & Pascarella, 1996; Tierney, 1992), age, classification, gender, level of personal development, career decisiveness (Long, Sowa, & Niles, 1995; Peterson, 1993),

out-of-class experiences/involvement (Astin, 1984; Cooper, Healy, & Simpson, 1994; Kuh, 1995), living arrangements (Chickering, 1969; Pascarella, Terenzini, & Blimling, 1994), financial aid (Cabrera, Nora, Castaneda, 1990; Niles, Sowa, & Laden, 1994; Nora, 1990; Volkwein & Szelest, 1995), and familial patterns (Gold, 1995; Schulteiss & Blustein, 1994).

Understanding a student's reasons for academic difficulties is pivotal for the continued success of postsecondary institutions in the future. Much of the current literature focuses on the attributes of the individual student when examining retention and attrition rates. However, some investigation has been conducted to encompass a broader perspective in the examination of the student's academic persistence (Benjamin & Hollings, 1995). Bean (1990) stated that "a student's leaving school is the joint responsibility of the school and the student" (p. 149). This study will continue the ongoing examination of the college or university as an environmental system that significantly affects the personal and academic development of the student and either supports a student's progress or presents barriers to achieving academic goals. Realizing that the task of examining every aspect of the educational system is an overwhelming endeavor and that systemic variables are often difficult to measure, this study will focus on analyze a portion of the variables that attempt to define the system, realizing that other areas need to be researched in the future.

Need for the Study

Extensive research has been conducted to examine the possible individual student characteristics that influence students in their educational pursuits (Anderson, 1985; Astin, 1975; Bank, Biddle, & Slavings, 1992; Beil & Shope, 1990; Cope & Hannah, 1975; Gold, 1995; Pascarella, Terenzini, & Blimling, 1994; Porter, 1989; Tinto, 1975). Less is known about the relationship of institutional characteristics to student persistence. Examination

of institutional characteristics in regard to retention could assist in our understanding of the institution as a system and, therefore, encourage us to explore systemic interventions in assisting students to manage their environment. It may also increase understanding of how persistence toward a college degree can be influenced by environmental circumstances (Astin, 1975; Beil & Shope, 1990).

Purpose of the Study

Understanding that the task of reviewing every aspect of the educational system is beyond the reasonable scope of a single project. The purpose of this study is to examine, from a systemic perspective, the relationship of limited identified institutional characteristics that impact the student's ability to succeed academically. As opposed to reviewing individual student characteristics and their influence on a student's success, the focus will be on the institution and a selected group of variables that have a possible effect on a student's persistence toward graduation. The characteristics that will be examined are the institution's Carnegie classification, size, wealth, complexity, location, and quality. These characteristics have been used in past research to describe the institutional environment (Kuh, Schuh, Whitt, Andreas, Lyons, Strange, Krehbiel, and MacKay, 1991). This study will extend that research to examine the relationship of these variables to retention. The problem of college student attrition considered from a limited systemic perspective will be addressed in this study.

Statement of the Problem

The problem investigated in this study is: What is the relationship of environmental predictors and institutional characteristics to college student persistence? This study examines the relationship of five-year graduation rates of students attending higher education institutions to specific characteristics found in the institution's environment.

Definition of Terms

Academic Success. This term refers to the positive progress made by a student academically to complete the required coursework necessary to satisfy the stated institutional requirements for the confirmation of a degree. Many factors, such as high school grade point average and familial and socio-economic background have been identified in past research that affect this success positively or negatively (Dey, 1990; Schultheiss & Blustein, 1994).

Acceptance Rate. This term is used among higher educational institutions to refer to the percentage of those students who were accepted from those who applied.

Attrition. This term is used in the higher education environment when referring to the rate of students who discontinue enrollment or drop out of classes. Bean (1980) defined it as "the cessation of individual student membership in an institution of higher education." (p. 157).

Campus location. Three specific locations were reported for this study. The first is urban which refers to a campus located within a large metropolitan environment. Second is suburban which would refer to a campus that is found in an area that surrounds a metropolitan city. Third is rural which refers to a campus located away from any area that is metropolitan in nature.

Dropout. A term which is defined by Astin (1971) as a student who fails to return for his/her subsequent year of college. This term does not indicate whether a return by the student will occur at a given point in the future.

Graduation Rate. This term refers to the reported percentage of students who graduate within a five-year period.

Institutional complexity/diversity. The Carnegie Foundation for the Advancement of Teaching (1990) stated in their special report, Campus Life: In Search of Community

that "Higher learning builds community out of the rich resources of its members. It rejects prejudicial judgments, celebrates diversity, and seeks to serve the full range of citizens in our society effectively" (p. 25). This term is operationally defined in this study as the percentage of total enrollment made up of ethnic minority, foreign, and commuting students.

Institutional environment. This term is used to describe an environment that includes many conditions and influences that affect the personal development and growth of the students (Kuh, et al, 1991). Campus environment has been broadly defined to include all the conditions and influences that could involve physical, chemical, biological, and social stimuli, that have been found to affect the growth and development of living things (Western Interstate Commission for Higher Education, 1972). This study will look at an institution's classification, size, wealth, complexity/diversity, campus location and quality/selectivity to assess environmental effectiveness.

Institutional classification. For this study, the term is operationally defined as the Carnegie Foundation Classification Codes. The institutions will be categorized as a) Research Universities I, b) Research Universities II, c) Doctoral Universities I, d) Doctoral Universities II, e) Master's (Comprehensive) Universities and Colleges I, f) Master's (Comprehensive) Universities and Colleges II, g) Baccalaureate (Liberal Arts) and Colleges I, and h) Baccalaureate Colleges II. The description of the characteristics of each category can be found in Appendix B (National Center for Education Statistics, 1994). The above classifications refer to the level of degrees offered and the years typically needed to complete the highest degree (Integrated Postsecondary Education Data Systems, 1994).

Institutional quality/selectivity. Bean, (1980) defined quality as "the degree to which the institution of higher education is perceived as providing a good education." (p.

159). Quality is a broad term when it is defined within an organization. It is used in literature to refer to many areas including the product of an institution, the level of education that a student received, and the type of environment. This term will be operationally defined for this study as the assessment of student characteristics through examination of the institutional acceptance rate and yield rate, the percent of freshmen who had a high school grade point average of 3.0 or higher, and the average SAT or ACT scores for entering students. Faculty characteristics that will be examined include the percent of full-time faculty with doctorates, the percent of part-time faculty, and the full-time to part-time ratio of faculty.

Institutional Size. This term is operationally defined as the total Full-Time Equivalent (FTE) enrollment reported for the Fall semester, total full-time faculty, total part-time faculty and the number of library resources available per FTE student.

Institutional Wealth. In this study, institutional wealth was defined by measuring specific areas of revenue and expenditures. This variable, that describes the reported level of resources available to a particular institution, includes the revenue from tuition and fees per FTE student, selected educational and general expenditures per full-time equivalent student, and the student/faculty ratio. Descriptions of the revenue and expenditure variables can be found in Appendix C.

Retention. This term is used in colleges and universities to refer to those who are maintaining a certain level of enrollment and are progressing toward graduation. These students are therefore "retained". It is often reported as a percentage rate for the institution and is taken over a four, five, or six year period of study. For this study, retention is operationally defined by examining the five-year graduation rate of freshmen as opposed to the four- or six-year rates. The five-year graduation rate is more universally used by institutions to determine the persistence of the majority of students.

Student Development. This term is defined by Strange (1994) as the "age-related developmental challenges that culminate into age-appropriate states of maturity or resolution at each chronological phase" (p. 402). Arthur Chickering (1969) did much research into the development of the traditional-aged college student and determined there to be seven vectors of development that are typically encountered. Those vectors include; Developing Competence, Managing Emotions, Developing Autonomy, Establishing Identity, Freeing Interpersonal Relationships, Establishing Purpose, and Developing Integrity.

Student Persistence. This phrase refers to a longitudinal characteristic that is evident through the behavior of the individual. Often identified as "persisters", these students are those who continue through the academic process to acquire their set goals, that usually being graduation. For this study, student persistence is operationally defined by reporting the five-year graduation rate for freshmen.

Traditional-aged college student. This term is operationally defined as a specific population of college students between the ages of 17 and 24.

Yield. This term is used among higher education institutions to refer to the percentage of students, who were accepted, and actually enrolled for the upcoming semester.

Assumptions and Limitations

1. It is assumed that the data used in this study, collected by the Integrated Postsecondary Education Data Systems (1995) and Annual Survey of Colleges (1995) published by The College Board, are accurate, given the fact that the data are acquired through annual institutional self-report.

2. The investigation is limited by the fact that the retention and institutional data being used are self-reported and may not be truly representative of the actual environment

on campus. Astin, Korn and Green (1987) observed that since institutional retention rates are often based on self-reported institutional data, it is found that the institutions use different definitions of retention and persistence. Also, Knox, Lindsay, and Kolb (1992) observed that retention or attrition rates are limited when used as indicators of student satisfaction. Porter (1989) stated that "The simple completion or dropout rate does not tell the whole story" (p. 22).

3. The study is limited in that the variables available for investigation from the Integrated Postsecondary Education Data Systems (1995) and The College Board Annual Survey of Colleges (1995) published by the College Entrance Examination Board have already been determined.

4. The results of this study are limited to the type of institutions selected and care should be used when generalizing beyond this scope.

5. This study is limited in the fact that the variables used to define the institutional environment are not inclusive of all components that work together to form the complex higher educational system. It is recognized that the quality of an educational institution is not limited to the resources used to rank institutions (Terenzini & Pascarella, 1994).

Significance of the Study

This study is significant because it focuses on the examination of the institutional environment in which the individual student functions and how that environment might affect persistence toward graduation. Also, the study produces information for examination by higher education managers in making decisions concerning institutional effectiveness when considering student persistence toward graduation. From an ecological perspective, this study examines and discusses the relationship between students and their environment as measured by the level of student persistence toward graduation. Since the major area of current research focuses on college student

persistence as related to individual student characteristics, this study is significant by beginning the process of exploring a systemic view of the relationship between self-reported graduation rates among institutions of higher education and the selected institutional characteristics that partially comprise the educational environment.

Research Questions

1. What is the relationship between college student persistence and an institution's classification?

2. What is the relationship between college student persistence and an institution's size?

3. What is the relationship between college student persistence and an institution's measures of wealth?

4. What is the relationship between college student persistence and an institution's complexity/diversity?

5. What is the relationship between college student persistence and an institution's campus location?

6. What is the relationship between college student persistence and an institution's measures of quality and selectivity?

Organization of the Study

Chapter 1 discusses the higher education environment and its relationship to retention. Chapter 1 presents the need for the study, the purpose of the study, the statement of the problem, definitions, assumptions, limitations, the significance of the study, and the research questions.

Chapter 2 gives an overview of literature concerning systems theory, environmental approaches, retention, and institutional characteristics. Chapter 3 describes the sample, data sources, and research design for this study. Chapter 4 discusses the

results of the analyses of the data. Chapter 5 suggests conclusions drawn from the analyses of the data and recommendations for future research.

CHAPTER II

REVIEW OF LITERATURE

Astin, Korn, and Green (1987) have stated that concern for retention rates in higher education has been prompted by interest in the declining enrollment and the increased public consideration over institutional performance and student outcomes. Expressing similar thoughts, Tinto (1987) reported that more than 40% of all college freshmen leave their institution before completing a degree, that 75% of these students leave within the first two years of college, and that an institution can expect that 56% of an entering freshmen class will not graduate. Clearly the retention of college students through their coursework and, ultimately, to the completion of an academic degree is an area that is of great concern to postsecondary institutions. Even though "the simple retention 'rate' tells us a lot more about who an institution *admits* than about how effective its retention practices are" (Astin, 1993, p. A48), these data are widely used to determine an institution's effectiveness.

Higher education can no longer survive on its historical academic reputation in order to retain students enrolled until their graduation. Terenzini and Pascarella (1994) stated that it is a myth to believe that "Institutional prestige and reputation reflect educational quality" (p. 29). Hogg and Hogg (1995) observed that students are becoming dissatisfied and frustrated with their experiences at higher education institutions. It has been observed that many students become "lost in the shuffle" once they have been accepted at a university and that schools often neglect weighing the costs of losing a student through attrition. Students are looking for a quality institution that goes beyond a school's financial wealth or the research credential of its faculty (Seymour, 1992). Our communities expect outcomes that are positive for the students, outcomes that are

measured by student satisfaction and academic success. There is a call for an accountability of the use of tuition and public monies and institutions must respond (Hartman & Schmidt, 1995; Levine, A. 1992; Sanders & Burton, 1996; Schroeder & Hurst, 1996; Terenzini, 1989; Volkein & Lorang, 1996).

The college experience is a major challenge to all students, both young and old (Sher, Wood, & Gotham, 1996). In addition to academic hurdles, traditional-age students are also challenged with personal and developmental growth issues that can be overwhelming. Brooks and DuBois (1995) observed that for many freshmen going to college acts as a catalyst in important developmental tasks. The tasks can include (a) the establishment of increased autonomy and independence, (b) the pursuit of intimacy in relationships, and (c) the development of a consistent sense of identity. Sher, Wood, and Gotham (1996) also observed that the freshman year at college, which occurs typically in the stage of young adulthood, is a transition period that brings changes in living arrangements, social support systems, and academic demands. Forced to span the gap to young adulthood, traditional-age college students often find themselves stretched between past developmental comforts and the future uncertainty in the adult community.

The reasons for attrition are recognized as complex behaviors with no simple explanations or cure (Bean, 1990). Several models and theories exist (Banks, Biddle, & Slavings, 1992; Bean, 1980; Benjamin & Hollings, 1995; Brower, 1992; Chickering, 1969; Kuh, 1995; Tinto, 1975, 1986) which establish a basis for exploring variables in the lives of college students and the institutional environment that affect persistence. Past research has moved from examining isolated conditions of the college student to taking a broader ecological position that considers the total campus environment.

This literature review presents the theoretical basis for this study in examining systems theory, environmental approaches to higher education, student development

theory, and research regarding retention. Also, an overview and description of each variable used in this study is presented. The purpose is to establish an understanding of organizational systems and environmental impact as a selected group of institutional characteristics in the higher educational setting were examined and the relationship between these facets of the college environment and a student's persistence toward graduation is explored.

Of the popular theories concerning student persistence and attrition put forth in the field of higher education, four have been chosen that relate to this study. A review of systems theory lays a foundation in examining higher education as an organizational system. This theoretical base is critical as we look at institutional characteristics in relation to student persistence. Systems theory aids in viewing the organization as a functioning unit where its parts are interactive and interdependent. This approach is helpful in seeing the effect a system has own its participants. Related to the systems orientation, environmental approaches are reviewed. The environmental and campus ecology models also support a broader view of the higher education organization and provide information to support the opinion that students are affected by their environment.

A foundational theory in the examination of student behavior is in the area of student development. Understanding the maturation process of the traditional-age college student aids in understanding the ability to persist toward achieving academic goals. Other theories and models that are related to student retention are also presented.

Systems Theory

Systems theory encourages us to view organizations as composites of interrelated units and it is beneficial to view the university as a system. Organizations in our society are given a specific role. That role is to coordinate activities of individuals to accomplish a purpose that is larger than one person can achieve alone (Beer & Walton, 1990). The

role of higher education organizations is to facilitate the education of individuals in particular fields for particular purposes. Higher education institutions are "human organizations" that are "potentially very complex systems operating in even more complex environments" (Fuqua & Kurpius, 1993, p. 607). Birnbaum (1988) reported that the study of how colleges and universities work requires that we view these institutions as organizations and as systems. Birnbaum continued by observing that, as higher education institutions are viewed as systems, the focus turns toward the dynamics through which the whole organization and its parts interact with each other. As the realization of how each component interacts with each other becomes apparent, agreement is evident that the "system" of higher education should be considered as a whole when examining why students drop out of their college classes.

Using a systems theory approach requires the researcher to take a larger view of the organization in analyzing potential relationships in research. Beer (1980), defines the theory of systems as "the ideas that help explain the dynamic interrelationships of several parts of a larger whole as it interacts with its environment." (p. 17). Colleges and universities are comprised of many offices and departments within their campuses. As these parts interrelate with each other to provide necessary services, they also affect and relate to the larger environment encompassing the institution. Also, as the student interrelates with the system, it is apparent how levels of personal development, student satisfaction, institutional fit, quality of life, student integration, and a student's involvement outside the classroom are affected by the environment. The components that comprise the college campus must work together to provide an environment that is conducive to growth, support, and acceptance for the students.

Systems theory stresses a global view of organizations and the importance of comprehending the foundational interrelationship between components that are found

within an organization (Aplin, 1978). Beer and Spector (1993) stated that there are two basic premises that form the foundation for systems theory. The first is the idea that organizations are constantly interacting with their external environment. The second premise reveals that organizations consist of multiple parts and components. University organizations have evolved into systems that directly affect the environment and the society in which they exist. One hundred years ago, institutions of higher learning were found to be small in size, isolated by location and social association, and comprised of students who were characteristically homogeneous (Kuh, 1991). Today, we see our learning communities to be large and organizationally complex while intricately involved in the surrounding community and society at large. As Beer and Spector (1993) pointed out, interactivity and interdependence are the emphases in systems theory. That conclusion can be seen in our institutions of higher education as we observe the intricate relationships that exist on our campuses across the United States. We have evolved into interdependent organizations that interact together to bring a specific service to the student, that being education.

Hurst (1987) reported that The American Council on Education (ACE) has proposed a systems approach to understanding the major components of student development in higher education. The variables included, (a) entering students bring a wide variety of characteristics to the institutions, (b) the environmental milieu of the institution is composed of aspects that affect students, (c) there is an interaction of the student and the institution, and (d) there is an output which represents the sum total of students' thoughts, feelings, and behaviors. The students' characteristics, the environmental milieu, their interaction, and the resulting output interrelate to affect each other. These system components are interdependent and are often sensitive to changes that occur within each area. When analyzing possible areas for intervention from a

systems perspective, the environmental milieu is the obvious factor that is sensitive to institutional change.

The students, being a part of the system, are also affected by the system. Dey and Hurtado (1995) stated that "the relationship between students and the college environment is both reciprocal and dynamic" (p. 207). Banning (1986) expressed that students should be viewed as "constructivists" that are allowed to influence, plan, and construct their own environments. The student is not only a distinct product of the educational system, but also a dynamic and influential part of the working environment. Not only are they influenced by the effectiveness of the system, but they are also an interacting part in the workings of that effectiveness. A definition of the higher education academic environment or system comes from Schroeder and Hurst (1996) when they observed that "Learning communities are characterized by associational groups of students and teachers, sharing common values and a common understanding of purpose, interacting within a context of curricular and cocurricular structures and functions that link traditional disciplines and cocurricular experiences in the vital pursuit of shared inquiry" (p. 178). Every group, office, and educational component interact to define the role of the system.

The understanding of higher educational institutions as systems that consist of interacting parts and, therefore, affect behavior on many levels, aids in our examination of students' ability to persist toward graduation. The study of systems theory is critical when looking at the organization of colleges and universities to explore various components of the institution.

Environmental Approaches

Environmental Models

The examination of the higher educational learning environment from a global perspective is relatively new in educational research . Dey and Hurtado (1995) observed that while environmental interactions have been recognized for some time, research in psychology has focused primarily upon the individual and has neglected the environment and its influence in which the individual functions. Coming from a marketing perspective where the student is perceived as the consumer, Grunig (1997) reported that the "consumer perceptions of higher educational service quality are primarily formed through the consumer's experience during encounters with the institution,..." (p. 22). Educational research in the field of environmental influence is turning to a global view in the explanations of conditions of higher education. King (1994) reported that the knowledge base available concerning systems and environments can provide educators with tools that identify methods to improve students' learning experiences and that these tools are based in the specific components of the campus environment model.

Research provides information concerning the relationship a student's environment has to his/her educational experience. Insel and Moos (1974) stated that "the way one perceives his surroundings or environment influences the way one will behave in that environment" (p. 179). The authors observed that we are affected by our environment in that our behavior can be influenced by the services and people around us. Overall, the specific environment where a student lives and functions has the potential of affecting a student's behavior. The question is raised as to who defines the institutional environment and its potential effect on students as they interact with the components of the system. Brower (1992) suggested that students form their personal college environment to mold with their own goals, plans, and expectations.

The role of the environment in the development of the student is so important that it can also contribute to the setbacks often suffered by individuals. Brooks and DuBois (1995) summarized past research suggesting that increased levels of exposure to stressors in the environment are related to inefficient adjustment in several areas. These areas include; increased levels of psychological pressure, decline in physical resistance to illness, and poor academic performance. An understanding of the environment in considering student development and how a specific entity can be beneficial or detrimental to students' learning and development is essential in the structuring of higher learning systems (King, 1994).

Strange (1994) concluded that "the college environment positively influences student development through physical features that are enabling; aggregate characteristics that are attractive, satisfying, and reinforcing; and organizational structures that are open and dynamic" (p. 409). Schroeder and Hurst (1996) observed that "Effective learning environments elicit the convergence of all the student's learning experiences" (p. 175). A student's academic pursuits and personal development happens as a direct result of their interaction with the milieu found on campus (Terenzini & Pascarella, 1994)

Campus Ecology

The campus ecology model also involves a global perspective that is environmental in nature. Banning and Kaiser (1974) stated that the basic premise of the ecological perspective is the interaction between the student and his/her environment. This idea holds that environments influence people and people influence environments. Benjamin and Hollings (1995), observed that many theories in higher education, including Astin's theory of involvement (1984) and Tinto's model of integration (1975), demonstrate an approach to building theory that is often focused either the person or the environment. The authors go on to propose that another approach to theory would be to examine

variables from a "both/and" perspective that is ecological in character. Such theoretical models, use a inclusive perspective to encompass a broad array of variables giving the researcher a look at broader picture of influences affecting student behavior. Kuh et al (1991) defined campus ecology as "the mutually shaping interactions between individuals and the environments of a college" (p. 99). Defined as subsystems, the students, the environment, and their interaction are targets of assessment and intervention when using an ecological approach (Hurst, 1987). This ecological model provides the researcher with the methodology in assessing environments and in designing campuses to produce an efficient fit between the student and the environment providing maximum growth academically and personally (Banning & Kaiser, 1974).

The Western Interstate Commission for Higher Education (1972) established a basic tenet of the ecological movement by observing that every student has the capacity for a wide variety of behaviors and a specific campus environment may encourage or inhibit any of these behaviors. The Commission continued by suggesting that the higher education campus should be specifically designed to offer the student opportunities, motivations, and support for growth and development. The ecological movement adheres to the idea that the student's individual characteristics are brought into their campus experience and are, therefore, affected by the interaction that occurs between the individual and the environment. The ecological movement also offers suggestions concerning the design of the campus to facilitate academic and personal growth. Huebner (1987) stated that "Campus ecology appears to float between a behavioristic/environmental approach and a true interactional approach" (p. 105).

Research concerning the role of institutional and individual characteristics and their integration helps to explain much of student behavior (Volkwein & Szelest, 1995). Past studies, specifically campus ecology models, have emphasized the critical importance of

establishing a "correct fit between the student and the institution as a key to student persistence and development" (Volkwein & Lorang, 1996, p. 45). Stoecher, Pascarella, and Wolfe (1988) observed that the most important factors that determined persistence behaviors were the students' academic and social integration at the institution. When changes to the environment are aimed at creating a better student-environment fit, the student benefits both academically and personally.

Other approaches that derive their constructs from the ecological view include the Quality of Life and Student Satisfaction models. Benjamin and Hollings (1995) stated that the "Quality of Student Life approach moves toward a coherent theory of satisfaction, based on an ecological perspective" (p. 574). The authors observed that Quality of Student Life, as a theoretical construct, comes from an ecological model of student satisfaction. Gielow and Lee (1988) suggested that one of the most direct tests of higher education success is the effective measure of student satisfaction. The quality and satisfaction models reveal the effectiveness of the environment that the student inhabits. Cameron (1983) suggested nine higher education organizational dimensions that are often used to measure institutional effectiveness. These dimensions include: (a) student educational satisfaction, (b) student academic development, (c) student career development, (d) student personal development, (e) faculty and administrator employment satisfaction, (f) professional development and quality of faculty, (g) system openness and community interaction, (h) ability to acquire resources, and (i) organizational health.

Environmental models and the perspective of campus ecology emphasize the interaction of the individual with his/her environment. This interaction affects the way in which one behaves. In the examination of a student's behavior in persisting toward graduation, an environmental or ecological view of the situation is critical. An ecological approach to research where the relationship of many variables to a specific outcome is

examined allows the researcher to better explain the environmental impact experienced by students. It is reasonable to assume that variables within the system affect its environment. This study makes an effort to emphasize the exploration of the higher education environment.

Student Development

The development of college students for a greater contribution to society is a historical goal of higher education (Strange, 1994). Chickering (1969), Heath (1968), Perry (1970), and Kohlberg (1969) were instrumental in crystallizing the ideas of student development theory in higher education for professionals in the field. Their models establish significant foundation in the study of the developmental phenomena that occurs during the critical growth period for the traditional-age college student. The historical work in student development has laid a rich foundation concerning the ideas and condition of the college student and the environment in which he/she lives (Strange, 1994).

Arthur W. Chickering (1969) theorized that traditional-age college students are in a critical time of establishing their own identity and beliefs. He observed that students are making the transition to college life and they often find themselves questioning relationships, the direction of their lives, and their self-worth. The seven stages or "vectors" proposed by Chickering were presented as being personal growth levels that were continuous and cumulative. Chickering proposed that the mastery of the stages occurred after repeated exposure to an appropriate environment. He also suggested that positive resolution of a crisis results in movement from one stage to the next. The seven vectors include, (a) Developing Competence, (b) Managing Emotions, (c) Developing Autonomy, (d) Establishing Identity, (e) Freeing Interpersonal Relationships, (f) Establishing Purpose, and (g) Developing Integrity. The central idea behind Chickering's theory is that students generally move through the seven vectors of development

sequentially, although it is recognized that traditional-age college students are not all homogeneous but arrive on campus at different developmental levels. This time in the life of the traditional-aged college student has the potential for significant influence by the environment. The reshaping of established commitments and expectations of the student is typical during the college experience.

Physical, sociological, psychological, and mental changes are occurring within each student as he/she works toward the achievement of his/her academic goals. Banning and Kaiser (1974) observed that in order for college students to reach maturity, there are specific tasks that they must learn to perform during this period of transition or growth. Brooks and DuBois (1995) observed that many adolescents who attend an institution of higher education are having to deal with greater autonomy, more independence, heightened exploration of social relationships, and a greater sense of identity. Students are struggling with new freedoms that bring not only excitement but also disturbing situations. As Brooks and DuBois also observed, many first year students experience feelings of isolation and loneliness which can partly be attributed to the separation from their families, having to deal with interpersonal conflicts, and bringing many unresolved personal difficulties with them to college. Understanding the potential personal hurdles that are encountered by the students, coupled with the stress of academic performance, allows the student personnel practitioner and researcher to form a clearer picture of the maturation process taking place for students.

The complexities of a student's development and acknowledging that his/her development does not occur in a vacuum must be considered (King, 1994). Realizing that progress through developmental stages does not occur independent of the environment and that the environment does impact a student individual characteristics, it appears logical to conclude that the environment also affects retention. As research has supported,

student development plays a critical part in student persistence toward graduation (Clark, Heist, McConnell, Trow, & Yonge, 1972; Hurst, 1987; Pascarella & Terenzini, 1991; Strange, 1994). This idea is supported by Lewin's (1936) differential interactionist paradigm, behavior is a function of the interaction between the person and his/her environment, [B=f(P,E)], which proposes the importance of both the person and the environment in understanding human behavior. To redefine this paradigm into a student development orientation, we could say that persistence toward graduation (behavior) is a function of the interaction between the characteristics of the individual college student and the environmental system of the higher education institution. Restated, students' behavior is the product of personal interactions with the institution's multiple environments made up of physical space, policies, and people (Huebner, 1987).

Student development and behavior do not occur within a social vacuum, but instead are influenced by the environmental system in which the student resides. While the examination of the campus from a system's perspective is important, so the understanding of the individual development of students is also foundational to this study. The dynamic interaction of the system and the individuals within the system while they are both developing and emerging requires a knowledge of the changes for both the system and the individual. This premise gives impetus to the study of the higher education institution from a systemic perspective when examining student persistence.

Retention

The retention of students until graduation has been studied through many perspectives. Several models emerge as relevant to persistence from a systems paradigm. Tinto (1986) theorized that students bring with them to college a set of existing traits that influences their initial levels of commitment to completing their degree and to the institution. He further observed that the students' traits, combined with their new social

and academic experiences, begin to reshape their academic and institutional commitments. Cabrera, Nora, and Castaneda (1993) noted that Tinto's theory discusses two areas of commitment: commitment to an academic goal and commitment to remain with the institution. These commitments are shaped by the matching between the student's motivation and academic ability and the institution's academic and social characteristics. The commitments that a student initially brings to college have been thought to be an influence on his/her persistence toward graduation (St. John, Paulsen, & Starkey, 1996). Although the individual characteristics that are present when a student arrives on campus have been found to affect a student's persistence toward graduation, this study intends to broadened the focus to include a more systemic view in addressing the problem of retention.

The process of integration and commitment is affected by the degree to which a student forms his/her place in the university environment. Brower (1992) stated that "integration exists when students can establish a 'niche' for themselves within the university community" (p. 443). Brower goes on to observe that the student finds this "niche" by developing avenues to accomplish his/her personal and educational goals within the college environment. This process can be accelerated or retarded depending on the student's opportunity to integrate within the university environment. A student's degree of academic and social integration has been found to relate to his/her persistence toward graduation (Steward, O'Leary, Boatwright, & Sauer, 1996) . Gerdes and Mallinckrodt (1994) found that a student's personal adjustment and integration into the social life of campus environment play a role that is at least as important as academic success when examining student retention. The campus system that works together to form an environment where students interact has been found to be influential in students' behavior and persistence.

Brower (1992) observed that the interaction between students and their college environments defines college student integration. This integration is the product of the students' interaction. Research has supported that the greater the degree to which a student can connect or feel a part of his/her environment the greater the commitment to complete an academic goal (Braxton, Vesper, & Hossler, 1995; Tinto, 1975). Tinto (1975) proposed that college students are more likely to withdraw if they are insufficiently integrated. Brooks and DuBois (1995) stated that there is a "positive relationship between social support and psychological and emotional adaptation during college" (p. 348). This concept of social integration is a partner in the social psychological perspective on student persistence and should be included in the overall evaluation of the college student.

Another model that incorporates a system perspective is the concept of student involvement outside of classes. Astin (1984) hypothesized that the level of a student's involvement outside of the classroom should be related to personal development. As the level of involvement increases, the level of development increases. Cooper, Healy, and Simpson (1994) observed that students who are involved outside the classroom in extracurricular activities experience an increased positive educational and social life within the university. These experiences were observed to increase intellectual and leadership development to expand success in academic and career goals, and to increase the student's potential to complete their degree. Students involved in out-of-class experience benefit in many areas including growth in critical thinking skills and organizational skills which have been found to contribute to a student's success and satisfaction after college (Kuh, 1995). Schroeder and Hurst (1996) reported that a positive learning environment must encourage the student to engage actively in his/her academic experience. This idea indicates that the engagement or involvement of the student is a positive activity with many promising outcomes.

Also, retention rates are affected by factors and components throughout an institution (Bean, 1990). A single office or dimension within the campus environment cannot be singularly cited as having influenced the rate of student retention. Therefore, a systemic approach is ideal for the examination of many factors and components within the university to explain student persistence behavior. Nora, Cabrera, Hagedorn, and Pascarella (1996) concluded in their study that the components that contributed the most to persistence decisions included university experiences, academic success, and environmental pull factors. The condition of the environment to encourage or inhibit a student's persistence toward graduation is a question that must be examined more closely.

Institutional characteristics work together to create a specific environment in which students interact. The nature and condition of these characteristics either nurture a healthy, supporting environment or limit its effectiveness to encourage persistence. This study examined how specific characteristics affect students' academic success. The chosen institutional characteristics, in this study, were used to define, in a limited fashion, the environment encountered by students in higher education institutions. The variables selected include, (a) institutional classification, (b) institutional size, (c) institutional wealth, (d) institutional complexity/diversity, (e) campus location and (f) institutional quality/selectivity.

Institutional Classification

The classifications used in this study come from the Carnegie Foundation Classification Codes (National Center for Education Statistics, 1994). The levels (see Appendix A) that have been included in this study are (a) Research Universities I, (b) Research Universities II, (c) Doctoral Universities I, (d) Doctoral Universities II, (e) Master's (Comprehensive) Universities and Colleges I, (f) Master's (Comprehensive) Universities and Colleges II, (g) Baccalaureate (Liberal Arts) and Colleges I, and

(h) Baccalaureate Colleges II. The different codes designated for each institution refer to the level of degrees offered and the years typically needed to complete the highest degree.

An institution's classification is often related to its purpose or mission. Kuh (1993) included educational purposes in his definition of an institution's mission. Other components that were considered part of a mission included (a) history of the organization, (b) religious/ideological beliefs, and (c) aspirations. Kuh stated that "An institution's mission often has a profound influence on its character" (p.661). The author concluded that the definition of higher learning's mission is broad-based and a long-term purpose of the organization that "guides institutional priorities and practices" (p. 661). Taking Kuh's position, it seems reasonable to see a relationship between an institution's level of academic classification and the effect the level has on the effectiveness of the system.

Institutional Size

Learning communities have changed drastically over the past four and a half decades. Since that time, the number of institutions has increased by 60 percent and enrollment has grown by almost 400 percent (Kuh, 1991). The size of an institution has become an issue in the consideration of the retention of students. Astin (1985) reported that a large enrollment size is an asset for an institution that is selective in its admissions practice, but can be a liability for an institution with a more open admissions policy. Porter (1989) observed that regarding the size of an institution, students in smaller independent or private colleges and universities have a higher tendency to complete their degree. Independent and private colleges and universities tend to have a lower enrollment over that of the public institutions. Kuh (1991) stated that the needs and concerns of students and faculty have been neglected due to the increased size and organizational complexity of many colleges and institutions. Evans (1996) reported that Chickering also

observed systemic environmental conditions that affected the resolution of developmental vectors. The environmental aspects included; (a) clear and consistent institutional goals, (b) organizational size, (c) curriculum design and teaching strategies, (d) interaction between faculty and students, (e) student communities that were diverse, (f) classroom teaching strategies, and (g) programming and services provided by student affairs. The institution's size as seen as a variable deserves consideration when examining the factors that encourages a student's persistence toward graduation.

Institutional Wealth

Financial resources, budgetary priorities, and allocations have become one of the greatest concerns for college and university leaders. Terenzini (1989) reported that "quality" in colleges and universities is often related to the amount of "resources" invested. Even though this can be seen as a narrow definition of "quality", it seems reasonable to assume that the wealth of an institution affects the environmental system. Parnell (1990) stated that the financial strains in many colleges and universities have become so intense that they affect all other areas of the campus environment including, but not limited to, tuition charges, faculty salaries, and maintenance of buildings. The question that emerges concerns the relationship between adequate funding and the degree to which an institution can provide an environment that promotes persistence among its students. St. John, Paulsen, and Starkey (1996) observed that the costs associated with attending a college had a direct effect on persistence. The authors noted that, with the rising costs associated with higher education, students are finding it difficult to pay for the living expenses and at the same time continue their enrollment. Porter (1989) observed that "the drop rate is substantially lower among students who received a grant during their first year. Only one of ten grant recipients left, while the rate for students without grants is one in four" (p. 22). It would appear to be easy to assume that the institutions' ability to provide adequate

resources for its students is a contributing factor in a student's persistence toward graduation.

Institutional Complexity/Diversity

A commitment to multiculturalism has been reported to be related to healthy campus communities (Kuh, 1991). Realizing that diversity in our society is projected to be a central part of our culture, then it is certain that college graduates will be challenged by increased diversity within our society regarding race, culture, and values (Pascarella, Edison, Nora, Hagedorn, & Terenzini, 1996). Pascarella and Terenzini (1991) reported that college attendance itself is a catalyst for a change in students toward greater openness and tolerance. With this growth, a student's development moves toward a mature status which enables them to behave within adult situations. The higher education environment is one that "rejects prejudicial judgments, celebrates diversity, and seeks to serve the full range of citizens in our society effectively" (The Carnegie Foundation for the Advancement of Teaching, 1990, p. 25). Encouraging diversity within the population served by institutions of higher education is a tool to increasing an institution's effectiveness.

Institutional Campus Location

Banning and Kaiser (1974) stated "...that different people respond differently in different types of environments...". This idea would lead to the premise that different locations (i.e. urban, suburban, and rural) could produce varying environments on college campuses which could in turn affect students' ability to persist toward graduation. The location of a specific campus often contributes to the size and wealth of an institution, and its degree of population complexity and diversity.

Institutional Quality/Selectivity

Research has indicated that the quality of an institution's students directly affect its retention rates. White and Mosely (1995) stated that in "institutions which are competitive in admissions policies, attrition ranges from 8% to 12% in the first year of study" (p. 400). Conversely, they report that colleges and universities that have policies of open admissions or have a lower criteria for admission can expect attrition rates to be between 40% and 60%. Grunig (1997) reported that past research has revealed that high selectivity in admission policies was found to be the most important characteristic of institutions that receive high overall undergraduate educational quality rating.

The effectiveness of an institution or quality can be defined by specific indictors such as student retention and student satisfaction with the college environment and academic achievements (Astin, Korn, & Green, 1987). Knox, Lindsay, and Nolb (1992) observed that measures of institutional effectiveness can include objective variables such as retention rates, academic abilities of students, or total number of graduates and can also include variables that are subjective such as reported satisfactions of students or graduates.

Summary

This chapter has provided an overview of the literature that supports the basic theoretical orientation for this study. A review of the environmental and campus ecology approaches was presented as the approaches relate to the interactive role of the organization with the students. The summary idea is that environments influence people and people influence environments (Banning & Kaiser, 1974). Student development theory was discussed as the foundational premise for the change of students during college years and as a basis for understanding student behavior. The goal of student development permeates the basic purpose of student affairs professionals and is critical to the focus of

this study. Retention models of commitment and integration (Tinto, 1986) were presented to assist in the understanding of student behavior as related to students' ability to persist toward graduation. In addition, discussion was presented concerning the five institutional variables that were studied, (classification, size, wealth, complexity/diversity, campus location, and quality/selectivity). In examining institutional characteristics that are believed to affect a student's persistence behavior, one realizes the complex nature of the organization and the impossible task to completely view every critical area. Cabrera, Castaneda, Nora, and Hengstler (1992) observed that college student persistence is the result of a complex set of interactions between the student and his/her environment. The nature of environmental impact on students' persistence behavior is indeed complex and deserves examination.

The process of application of research findings to the professional practice is difficult even in the simplest forms. This move from theory to practice requires reprioritizing of objectives, financial resources, and administrative support. Porter (1989) stated that "Increased retention requires increased institutional self-examination, not simply the imposition of new standards for access and performance on students. It is a task that must be undertaken by all of higher education" (p.22). The creation of a learning environment that has purpose and power is the greatest challenge that is faced by the academic community today (Schroeder & Hurst, 1996). There must be a move to take a broader look at the university system and to observe the effect the system has on students' ability to persist toward graduation.

In summary, college students face many challenges. These challenges work together to determine the level of success in the attainment of their academic goals. Chickering and Potter (1993) stated that "higher education's most important function is to help students clarify their future plans, understand what is needed to realize those plans,

design a program that moves them toward their goals, and teach them how to keep progressing on their own." (p. 36). It is believed that the attainment of true excellence within the institution relies on the university's ability to motivate its students and faculty positively, to encourage academic and personal development, and to make a difference in individuals' lives that is positive (Astin, 1985). The question then becomes, "How does an institution put into practices the necessary changes to improve the system that affects students and what areas should be focused upon?" This study is a move in this direction as institutional/system characteristics that have some influence in the area of student persistence are examined.

CHAPTER III

METHOD AND DESIGN

With a foundation based on the review of the literature and possible implications for professional practice when considering the environmental impact on college student persistence toward graduation, the methods for this study were established. This study examined the relationship of environmental predictors and institutional characteristics to student persistence toward graduation. If this study supports the connection between student persistence toward graduation and the six selected institutional characteristics, it would support the premise that college environments do affect students' behavior. This chapter outlines the methodology for this study.

This research of the postsecondary environment and its impact on student persistence examined the institutional self-reported data of institutions found in the following Carnegie Foundation Classification Codes: (a) Research Universities I, (b) Research Universities II, (c) Doctoral Universities I, (d) Doctoral Universities II, (e) Master's (Comprehensive) Universities and Colleges I, (f) Master's (Comprehensive) Universities and Colleges II, (g) Baccalaureate (Liberal Arts) and Colleges I, and (h) Baccalaureate Colleges II. The description of the characteristics of each category can be found in Appendix B (National Center for Education Statistics, 1994). The relationship between the self-reported retention rates and the institutional characteristics as collected by the Integrated Postsecondary Education Data Systems from the Office of Educational Research and Development and College Entrance Examination Board was examined. The institutional characteristics that were available for consideration include, (a) an institution's classification, defined by identifying the institutional type and the highest degree that is offered; (b) a determined size, defined by total FTE enrollment, number of full-time faculty, number of part-time faculty, library expenditures; and (c) a level of wealth,

defined by assessing the revenue, expenditure patterns, and the student/faculty ratio. Also, an examination was conducted concerning (d) the institutional complexity and diversity, determined by the percentage of ethnic minority, foreign, and commuting students; (e) campus location; (f) the measures of quality and selectivity, defined by looking at the student and faculty characteristics; and (f) the reported five year graduation rates. These measures provided a narrowly defined view of the university system and how its environment might affect a student's commitment to persist toward graduation.

Research Questions

1. What is the relationship between college student persistence and an institution's classification, (i.e. institutional type)?

2. What is the relationship between college student persistence and an institution's size, (i.e. total FTE enrollment, number of full-time and part-time faculty, total faculty, monies spent on library resources)?

3. What is the relationship between college student persistence and an institution's measures of wealth, (i.e. revenue per student, expenditure patterns, student/faculty ratio)?

4. What is the relationship between college student persistence and an institution's complexity/diversity, (i.e. percentage of minority, foreign, and commuting students)

5. What is the relationship between college student persistence and an institution's campus location?

6. What is the relationship between college student persistence and an institution's measures of quality and selectivity, (i.e. student characteristics, faculty characteristics)?

Research Design

The data for this study were archival data obtained from the Integrated Postsecondary Education Data System (1994), commonly known as IPEDS, and the College Entrance Examination Board (1995). No additional instruments or data collection

procedures were necessary. IPEDS is a single comprehensive system of data collection, from the National Center for Educational Statistics, that has been designed to provide vital information concerning postsecondary institutions in the United States (IPEDS Manual, 1994). IPEDS surveys postsecondary institutions that include colleges and universities as well as technical and vocational institutions (National Center for Educational Statistics, 1995). IPEDS was created in 1986 and replaced the Higher Education General Information Survey, (HEGIS) at that time. From 1965 to 1986, HEGIS surveys were used to collect data from 3,500 institutions that were accredited by an accrediting organization recognized by the United States Secretary of Education (IPEDS Manual, 1994). IPEDS expanded its survey use to include approximately 12,000 educational providers. The IPEDS consist of several integrated components including; (a) institutional characteristics: (b) information on students; (c) financial revenues and expenditures; and, (d) information on programs, staff, and academic libraries.

The second data source came from College Entrance Examination Board (1995). It provided organizational measures of complexity variables that reported the percentage of commuting students and institutional location; selectivity indicators that included the student acceptance rate, percentage of freshmen with a 3.0 or higher high school grade point average, the average Scholastic Aptitude Test or ACT scores, and the five year retention rate for the selected institutions.

Multiple regression analyses were conducted to examine the relationship between the five-year graduation rate of the subjects and four of the six identified institutional characteristics representing the university system. Those four characteristics included (a) institutional size, (b) institutional wealth, (c) institutional complexity and diversity, and (d) institutional quality and selectivity. Regression analysis is a method of examining the variability of a dependent variable with information attained on one or more independent

variables (Pedhazur, 1982). This analysis indicates whether there is a relationship between these institutional characteristics and environmental indicators and graduation rates.

Analysis of variance was used for the two classification variables which were (a) institutional classification and (b) campus location. This procedure was used to test the null hypothesis for the population means. The purpose of the analysis of variance is to test the null hypothesis when there is more the one mean. This is done by classifying the total variability in two different parts: variability between the groups and variability within the groups. This procedure allows one to compare the two groups and produces an F-ratio in order to reject or fail to reject the null hypothesis (Witte, 1985).

For each of these procedures, the dependent variable is the measure of graduation rate for each institution. The independent variables are selected institutional characteristics, that being classification, size, wealth, complexity/diversity, location and quality/selectivity, that provide an limited view of the environment on campus. The following diagram reveals the sets of variables.

Independent Variables
(Continuous & Categorical)
Classification
- Institutional classification

Size
- Total FTE Enrollment
- Total of Full-time Faculty
- Total Part-time Faculty
- Library Expenditures per FTE Student

Wealth
- Tuition and Fees per FTE student
- Expenditure Patterns per FTE Student
  - Instructional
  - Academic Support
  - Auxiliary Services
  - Student Services
- Student/Faculty Ratio

Dependent Variable
(Continuous)
Student Graduation Rate

Complexity/Diversity
- Percent of Minority
- Percent of Foreign
- Percent Commuting

Campus Location (Urban, Suburban, Rural)

Quality/Selectivity
- Student Characteristics
  - Acceptance Rate
  - Yield Rate
  - Percent Freshmen with 3.0 or higher high school GPA
  - Midpoint SAT and Converted ACT Scores
- Faculty Characteristics
  - Percent of Full-time Faculty with Doctorates
  - Percent Part-time Faculty
  - Full-time/Part-time Faculty Ratio

Subjects

The subjects that were used in this study were institutions that were contained in the two databases which were merged together to provide one data set. The institutions selected were schools that confer at least a bachelor's degree in both the public and private sectors. Using the Carnegie Foundation Classification Codes, the university subjects were classified as (a) Research Universities I, (b) Research Universities II, (c) Doctoral Universities I, (d) Doctoral Universities II, (e) Master's (Comprehensive) Universities and Colleges I, (f) Master's (Comprehensive) Universities and Colleges II, (g) Baccalaureate (Liberal Arts) and Colleges I, and (h) Baccalaureate Colleges II. The description of the characteristics of each category (National Center for Educational Statistics, 1994) can be found in Appendix B. The Carnegie Foundation for the Advancement of Teaching is used to assist in the delineation of institutions by type. The classifications are based largely on academic mission and are not intended to measure quality. Institutions are classified

according to their highest level of offering, the number of degrees conferred by discipline, and the amount of federal support for research received by the institution, (IPEDS Manual, 1994).

The institutions were selected from all regions included in the continental United States which omits outlying regions such as Guam, Puerto Rico, and Virgin Islands. The institutional characteristics that were available for consideration through the IPEDS and College Entrance Examination Board computer database include: (a) an institution's classification, defined by identifying the institutional type and the highest degree that is offered; (b) a determined size, defined by total FTE enrollment, number of full-time faculty, number of part-time faculty, and library expenditures/student; and (c) a level of wealth, defined by assessing the revenue per student, expenditure patterns per student, and the student/faculty ratio. Also, an examination was conducted concerning (d) the institutional complexity and diversity, determined by the percentage of minority, foreign, and commuting students; (e) campus location; (f) the measures of quality and selectivity, defined by looking at the student and faculty characteristics; and (f) the self-reported five-year graduation rates.

Independent Variables

Institutional Classification

The classifications used in this study come from the Carnegie Foundation Classification Codes (IPEDS, 1994). The various levels (see appendix B) include (a) Research Universities I, (b) Research Universities II, (c) Doctoral Universities I, (d) Doctoral Universities II, (e) Master's (Comprehensive) Universities and Colleges I, (f) Master's (Comprehensive) Universities and Colleges II, (g) Baccalaureate (Liberal Arts) and Colleges I, and (h) Baccalaureate Colleges II. The different codes, established by the Carnegie Foundation, were used to designate each institution as to the level of

degrees offered and the years typically needed to complete the highest degree. The College Board translated the Carnegie classification codes into numbers by tens (i.e. 11-Research Universities I = College Board Code 10). (See Appendix B)

Institutional Size

In this study, size is a composite variable that is determined by calculating the Full-Time Equivalent (FTE) equation of students enrollment in the institution, the total number of full-time and part-time faculty, and the amount allocated to library expenditures per student. The data on Full-Time Equivalency was determined by adding the full-time enrollment number with a third of the total students that are attending classes on a part-time basis.

Institutional Wealth

This composite variable included the total tuition and fees per FTE student, expenditure patterns per FTE student in the areas of instruction, academic support, student services, auxiliary services, and the student/faculty ratio. The student/faculty ratio was derived by dividing the total full-time faculty by the total full-time equivalent student number. Descriptions of the revenue and expenditure variables can be found in Appendix C.

Institutional Complexity/Diversity

This composite variable was operationally defined in this study as the percentage of total enrollment made up of ethnic minority, foreign, and commuting student.

Institutional Campus Location

This categorical variable includes three types of location for higher education institutions. They include urban, suburban, and rural. This information was provided by the College Entrance Examination Board database.

Institutional Quality/Selectivity

This variable is also a composite variable. The current study examined an institution's quality and selectivity by assessing student characteristics through examination of the institutional acceptance rate (applied to accepted), the yield rate (accepted to enrolled) the percent of freshmen with a 3.0 or higher high school grade point average, and the SAT or converted ACT scores midpoint-50th percentile for entering students. Faculty characteristics were determined by reviewing the percentage of full-time faculty with a doctoral degree, percentage of part-time faculty, and the full-time/part-time faculty ratio.

Instrumentation

Data on the subjects were obtained from databases previously collected by the Integrated Postsecondary Education Data Systems and the College Entrance Examination Board. No additional instruments or data collection procedures were necessary. IPEDS complies its data from a series of nine integrated surveys that provide basic characteristics for all postsecondary institutions. There are four annual and 3 biennial surveys providing details for all 4,000 institutions of higher education and an annual sample survey provides selected data for about half of the remaining smaller public and private institutions. The College Board data come from a two-part questionnaire entitled "The College Board Annual Survey of Colleges" and "The College Board Annual Survey of Colleges, Part 1B - Undergraduate Annual Expenses and Financial Aid". The survey contains general information, academic offerings and policies, placement and credit policies, freshman admissions, foreign student information, office technology and information, and major fields of study. The second part survey contains information concerning annual expenses and financial aid (College Entrance Examination Board, 1995)

Procedures

This study was given exempt status from the Oklahoma State University Institutional Review Board (Appendix A). Data for this study were acquired through two national computer database resources. The 1994 Integrated Postsecondary Education Data Systems from the Office of Educational Research and Development provided a CD-ROM with information concerning a variety of institutional, student, and staff characteristics. The 1994 College Board Survey provided additional data on computer disk that included further institutional characteristics and retention rates. This information was merged through the use of the Fice Code, a 6-digit identification code created by the Federal Interagency Committee on Education, to create a database which allowed the examination of the research questions concerning the relationship between retention and institutional characteristics. College Entrance Examination Board database provided information on 1353 postsecondary institutions in the continental United States. The Integrated Postsecondary Educational Data Systems provided information on 1399 postsecondary institutions. The merging of these two databases provided a possible 1440 institutions. There were 128 institutions deleted from the merged set because they were either missing all of the College Entrance Examination Board information or were missing all of the Integrated Postsecondary Educational Data Systems information. This process yielded a database of 1312 institutions.

Data Analysis

Multiple regression analyses were conducted to examine the relationship between the five-year graduation rate of the subjects and four of the six identified institutional characteristics representing the university system. Those four included: (a) institutional size, (b) institutional wealth, (c) institutional complexity and diversity, and (d) institutional quality and selectivity. Regression analysis is a method of examining the variability of a

dependent variable with information attained on one or more independent variables (Pedhazur, 1982). This analysis indicates whether there is a relationship between these institutional characteristics and environmental indicators and graduation rates.

Analysis of variance was used for the two classification variables which were (a) classification and (b) campus location. This procedure was used to test the null hypothesis for the population means. The purpose of the analysis of variance is to test the null hypothesis when there is more than one population mean. This is done by classifying the total variability in two different parts: variability between the groups and variability within the groups. This procedure allows one to compare the two groups and produce an F-ratio in order to reject or fail to reject the null hypothesis (Witte, 1985).

CHAPTER IV

RESULTS

The purpose of this study was to examine the relationship of identified institutional characteristics to the students' ability to succeed academically. Interest in this study is based on the popular view that a higher education institution is a system that directly and indirectly affects all of its components. As opposed to reviewing individual student characteristics and their influence on students' success, the focus is on a more systemic view and the effect of institutional variables on students' persistence toward graduation. This study is an effort to begin to provide a foundation to integrate the student persistence research with a systems perspective. This study was developed to examine specified institutional characteristics and to look at their relationship to a five-year graduation rate.

The institutional characteristics that were available and chosen for consideration include: (a) an institution's classification, defined by identifying the institutional type, according to the Carnegie classifications (1994); (b) a determined size, defined by total FTE enrollment, number of full-time faculty, number of part-time faculty, and library expenditures per FTE student; and, (c) a level of wealth, defined by assessing selected revenue and expenditure patterns, and the student/faculty ratio. Also, an examination was conducted concerning: (d) institutional complexity and diversity, determined by the percentage of ethnic minority, foreign, and commuting students; (e) campus location; (f) the measures of quality and selectivity, defined by looking at the student and faculty characteristics; and, (g) the reported five-year graduation rates. Table 1 gives the variable organization and the computer derivations that were used. These measures suggest a specific view of the university system.

Table 1

Variable Organization and Computer Derivations

Independent Variables (Continuous & Categorical)	Dependent Variable (Continuous)
Classification:	Student Graduation Rate - *gradrate*
Institutional type - *class*	
Size:	
Total FTE Enrollment - *fteenr*	
Total Full-time Faculty - *ftfac*	
Total Part-time Faculty - *ptfac*	
Library Resources - *libst = library/FTE student*	
Wealth:	
Revenue per Student	
Tuition and Fees per FTE student - *tuifeest=tuition/FTE studt*	
Expenditure Patterns per Student	
Instructional - *instrst=instr/FTE student*	
Academic Support -*acadst=acad/FTE student*	
Student Services -*stserst=stser/FTE student*	
Auxiliary Services-*auxst=aux/FTE student*	
Student/Faculty Ratio - *stracrat=fteenr/totfac*100*	
Complexity/Diversity	
Percent of Minority - *pctmin*	
Percent of Foreign - *pctfor*	
Percent Commuting - *pctcom*	
Campus Location - *loc*	
Quality/Selectivity	
Student Characteristics	
SAT Midpoint - *SATmp=(SAT25+SAT75)/2 and converted (ACT25+ACT75)/2 merged*	
Acceptance Rate - *acctrate=applied/accepted*	
Yield Rate - *yield=% of accepted who enrolled*	
Percent Freshmen with 3.0 or higher high school GPA - *pctfresh*	
Faculty Characteristics	
Percent of Full-time Faculty w/Doctorates-*pctftdr=(ftdr/ftfac)*100*	
Percent of Part-time Faculty-*pctpt=100*ptfac/(ptfac+ftfac)*	
Full-time/Part-time Faculty Ratio - *ftptrati=(ftfac/ptfac)*100*	

The research questions addressed in this study were:

1. What is the relationship between college student persistence and an institution's classification, (i.e. institutional type)?

2. What is the relationship between college student persistence and an institution's size, (i.e. total enrollment, number of full-time and part-time faculty, monies spent on library resources)?

3. What is the relationship between college student persistence and an institution's measures of wealth, (i.e. tuition and fees revenue per student, expenditure patterns, student/faculty ratio)?

4. What is the relationship between college student persistence and an institution's complexity/diversity, (i.e. percentage of minority, foreign, and commuting students)?

5. What is the relationship between college student persistence and an institution's campus location?

6. What is the relationship between college student persistence and an institution's measures of quality and selectivity, (i.e. student characteristics, faculty characteristics)?

The results presented in this chapter are the analyses that are related to the stated research question and the procedural analyses.

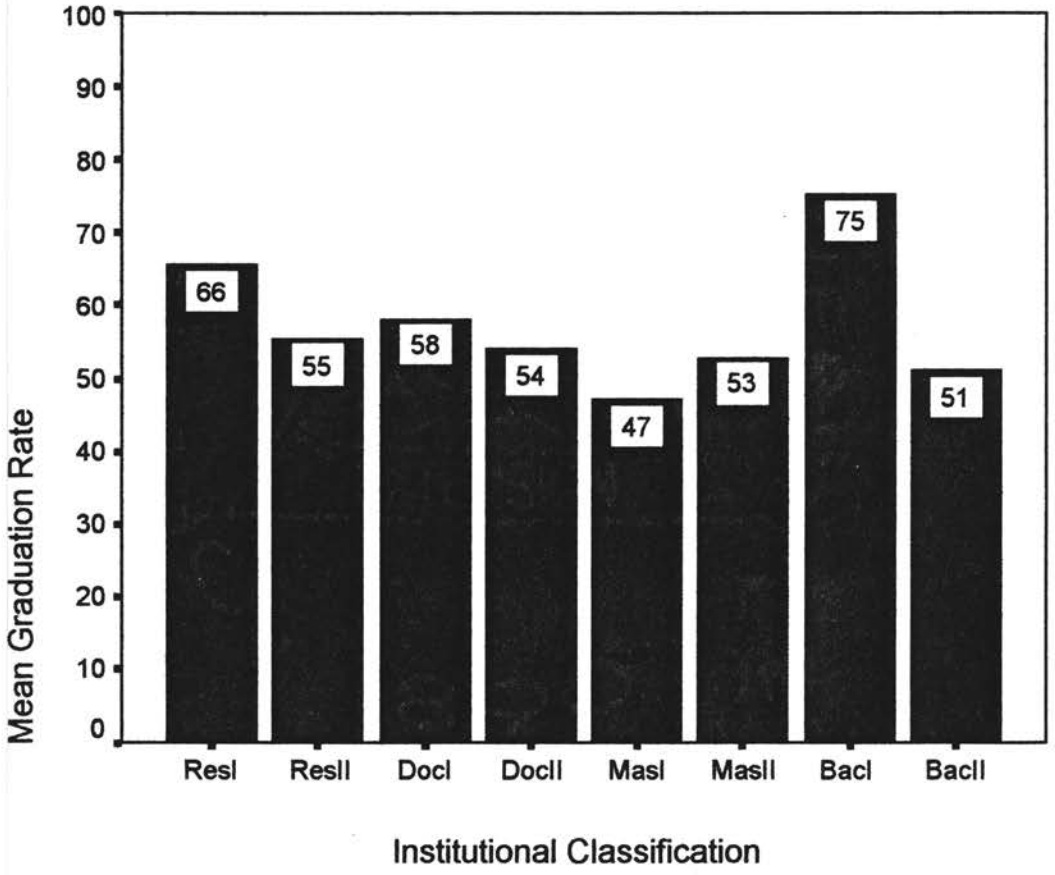
Results Related to Research Questions

1. What is the relationship between college student persistence and an institution's classification, (i.e. institutional type)?

Since an institution's classification is a categorical variable, Question One was examined by looking at the graduation rate means for each institutional classification (see Appendix B). First, in Figure 1, a bar graph is presented to provide an overall view of the means. Then, Table 2 present a summary of the means and standard deviations.

Figure 1

Bar Graph for Graduation Rate on Classification



Note: Institutional Classification definitions can be found in Appendix B.

The bar graph of the means of each Carnegie Classification in Figure 1 indicates that the highest mean graduation rate occurs in the Baccalaureate (Liberal Arts) Colleges I (Carnegie Code 31, College Board Code 70) with a five-year graduation rate mean of 75.01%. Research I Universities were the second highest with a graduation rate mean of 65.48%. The additional classification means and standard deviations can be examined in Table 2 that follows.

Table 2

Institutional Classification Graduation Rate Means and Standard Deviations

College Board Code	Classification	Mean	SD
10	Research I	65.48	17.88
20	Research II	55.34	16.60
30	Doctoral I	58.10	21.76
40	Doctoral II	53.89	16.77
50	Master's I	46.90	18.77
60	Master's II	52.67	15.21
70	Baccalaureate I	75.01	12.31
80	Baccalaureate II	50.86	14.87
TOTAL		54.10	18.49

Table 2 presents a summary of the institutional classifications and their five-year mean graduation rate and standard deviations. As is seen, Baccalaureate I has the highest graduation rate and the smallest standard deviation which indicates a more consistency in the mean graduation rate within this classification. However, Doctoral I institutions had a mean graduation rate of 58.10 with a standard deviation of 21.76. This indicates a wide spread of means within this institutional classification. The majority of graduation rates among Doctoral I institutions range from 36.34 to 79.86. The mean five-year graduation rate for all institutions was 54.10% with a standard deviation of 18.49%. The majority of

all four-year postsecondary institutions have fine-year graduation rates that range between 35.61% and 72.59%.

In order to answer Research Question One with institutional type or classification as the dependent variable and graduation rate at the independent variable, an one-way ANOVA was performed to test the relationships among the means, as seen in Table 3.

Table 3

Summary of One-Way Analysis of Variance - Institutional Classification x Five-year Graduation Rate

	Sum of Squares	df	Mean Squared	F	Sig.
Between Groups	78103.305	7	11157.615	41.746	.000
Within Groups	271284.918	1015	267.276		
Total	349388.223	1022			

The F-statistic for testing if a difference exists between the graduation rate means within the institutional classifications is 41.746 with a significance of > or less than .01. Eta-squared can be calculated from Table 3 by dividing the Sum of Squares Between Groups with the Sum of Squares Total. Institutional classification accounted for 22.35% of the variance in mean graduation rate.

Also, because the between groups means were significantly different, a post hoc test, Tukey's HSD, was performed. The matrix summarizing the comparisons can be found in Table 4. Additional information of the post hoc test can be found in Appendix F.

Table 4

Tukey HSD Significance Matrix with Multiple Comparisons on Graduation Rate Means within Classification

Classification	10	20	30	40	50	60	70	80
10-Research I	----							
20-Research II	.082	---						
30-Doctorial I	.333	.997	---					
40-Doctorial II	.006**	1.00	.935	---				
50-Masters I	.000**	.100	.001**	.122	---			
60-Masters II	.000**	.991	.588	1.00	.015*	---		
70-Baccalaureate I	.005**	.000**	.000**	.000**	.000**	.000**	---	
80-Baccalaureate II	.000**	.822	.146	.940	.065	.964	.000**	---

*p<.05 **p.01

From these results, it can be concluded that institutional classification accounts for 22.35% of the variance in graduation rate. This finding suggest a statistically significant relationship exist between institutional classification and the five-year graduation rate. There was also significant mean differences between the classifications. The graduation rate for Baccalaureate I (70) institutions was significantly different from all the other classifications. The graduation rate for the Research I (10) institutions was significantly different with all other classifications except for Research II (20) and Doctorate I (20).

Significant differences were also found between Doctorate I (30) and Masters I (50) and between Masters I (50) and Masters II (60).

2. What is the relationship between college student persistence and an institution's size, (i.e. total FTE enrollment, number of full-time and part-time faculty, and monies spent on library resources)?

To respond to Research Question Two, a multiple linear regression was conducted using the variables selected to define an institution's size. Those variables included: full-time equivalent student enrollment, total full-time faculty, total part-time faculty, and monies spend on library per FTE student. Of the total number of institutions in the data bank (1311), only part of them (959) reported the necessary data for analysis. Descriptive statistics for the sample used in the multiple regression are included in Appendix I.

Table 5

Summary of the Multiple Linear Regression of the Institution's Size Variables x Five-Year Graduation Rate (N=959)

Model	Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	Library/Student	.439	.192	228.121**	.192	228.121**	.439**
2	FTE Enrollment	.486	.236	147.805**	.044	54.690**	-.204**
3	Part-time Faculty	.491	.241	101.101**	.005	6.113*	-.122**
4	Full-time Faculty	.492	.242	76.127**	.001	1.155	-.039

*p<.05 **p.01

Note: Correlations can be found in Appendix H.

This regression was obtained by regressing the four variables selected to define institutional size on the five-year graduation rate. The regression equation with all of the variables entered was significant at .01 alpha level and accounted for approximately 24% of the variance in graduation rate. As shown in Table 5, the Library/Student variable accounted for approximately 19% of the variance. The inclusion of the remaining variables added only an additional .05 to the variance. From these results, it is clear that there is a statistically significant relationship between graduation rate and the composite size variable.

3. What is the relationship between college student persistence and an institution's measures of wealth, (i.e. revenue per student, expenditure patterns, student/faculty ratio)?

To respond to Research Question Three, a multiple linear regression was conducted using the variables selected to define an institution's wealth. Those variables included: Tuition and Fees/Student, Instruction Monies/Student, Academic Support/Student, Student Services Monies/Student, Auxiliary Monies/Student, and Student/Faculty Ratio. There were 940 subjects who reported the necessary data for analysis. Descriptive statistics for the sample used in the multiple regression are included in Appendix I.

Table 6

Summary of the Multiple Linear Regression of the Institution's Wealth Variables x Five-year Graduation Rate (N=940)

Model	Wealth Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	Tuition Fees/Student	.588	.345	494.930**	.345	494.930**	.588**
2	Auxiliary/Student	.645	.417	334.614**	.071	114.440**	.526**
3	Instruction/Student	.655	.430	235.006**	.013	21.295**	.335**
4	Student/Faculty Ratio	.658	.433	178.660**	.004	5.918**	-.282**
5	Student Services/Student	.659	.435	143.572**	.001	2.258**	.412**
6	Academic/Student	.659	.435	119.660**	.000	.490**	.295**

*p<.05 **p<.01

Note: Correlations can be found in Appendix H.

After the first variable was entered, Tuition and Fees/Student, the contribution of the remaining variables can be accounted for by the artifact of multicollinearity which reflects the interrelations among the independent variables. This regression was obtained by regressing the six variables selected to define institutional wealth on the five-year graduation rate. The regression equation with all of the variables entered was significant at .01 alpha level and accounted for approximately 43.5% of the variance in graduation rate. As shown in Table 6, the Tuition and Fees per Student accounted for about 34.5% of the variance. The addition of Auxiliary/Student and Instruction/Student added .084 to

the variance, and the remaining variables together provided an additional .005. These results, suggest a clear relationship that is statistically significant between graduation rate and the composite wealth variable.

4. What is the relationship between college student persistence and an institution's complexity/diversity, (i.e. percentage of minority, foreign, and commuting students)?

To respond to Research Question Four, a multiple linear regression was conducted using the variables selected to define an institution's complexity and diversity. Those variables included: Percent Commuter Students, Percent Minority Students, and Percent Foreign Students. The number of subjects that reported the necessary data for this analysis 932. Descriptive statistics for the sample used in the multiple regression are included in Appendix I.

Table 7

Summary of the Multiple Linear Regression of the Institution's Complexity/Diversity Variables x Five-year Graduation Rate (N=932)

Model	Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	Percent Commuter	.587	.344	487.935**	.344	487.935**	-.587**
2	Percent Minority	.612	.375	185.597**	.016	23.955**	-.189**
3	Percent Foreign	.616	.379	141.513**	.004	6.163*	.128**

*p<.05 **p<.01

Note: Correlations can be found in Appendix H.

This regression was obtained by regressing the three variables selected to define institutional complexity and diversity on the five-year graduation rate. The regression equation with all of the variables entered was significant at a .01 alpha level and accounted for approximately 38% of the variance in graduation rate. As shown in Table 7, the Percent Commuter Students variable accounted for about 34% of the variance. The addition of Percent Minority Students added .016 to R^2 and the remaining variable, Percent Foreign, added only an additional .004 to the variance. From these results, there appears to be a statistically significant relationship between Graduation rate and the Complexity and Diversity composite variable, with the Percent Commuter being the strongest influence in the variance.

5. What is the relationship between college student persistence and an institution's campus location?

Since an institution's campus location is a categorical variable, Question Five was examined by looking at the graduation rate means for each location (Urban, Suburban, Rural). First, in Figure 2, a bar graph is presented to provide an overall view of the means. Table 8 presents a summary of the means and standard deviations.

The bar graph of the means of each Campus Location in Figure 2 indicates that the highest mean graduation rate occurs in the Suburban location with a five-year graduation rate mean of 56.18. Rural location was second with a graduation rate mean of 53.31. Urban location had a graduation rate mean of 51.30. Table 8 presents a summary of the means and standard deviations for campus location.

Figure 2

Bar Graph for Graduate Rate on Campus Location

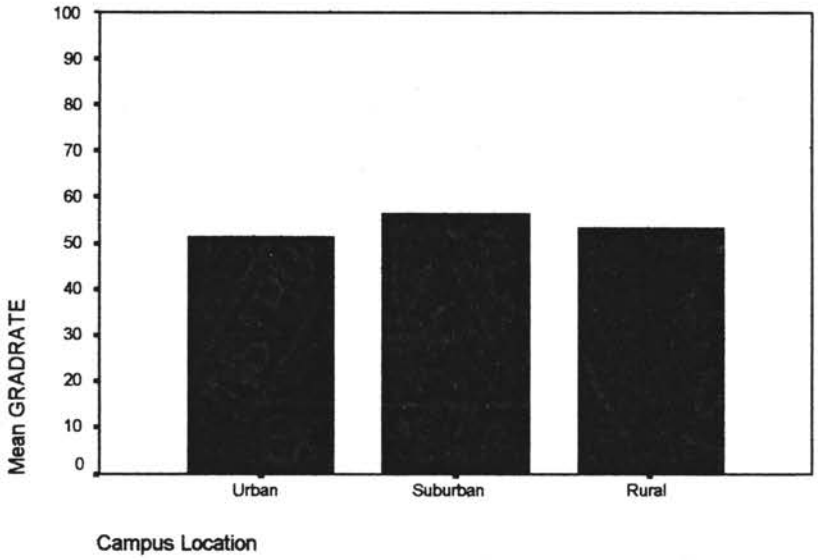


Table 8

Campus Location Means and Standard Deviations

Location	Mean	SD
Urban	51.30	19.86
Suburban	56.18	18.75
Rural	53.31	16.31

In order to answer Research Question Five with institutional campus location as the dependent variable and graduation rate at the independent variable, an one-way ANOVA was performed to test the relationships among the means. The results are presented in Table 9.

Table 9

One-Way Analysis of Variance - Institutional Campus Location x Graduation Rate

	Sum of Squares	df	Mean Squared	F	Sig.
Between Groups	4266.688	2	2133.344	6.305	.002
Within Groups	345121.535	1020	338.354		
Total	349388.223	1020			

The F-statistic for testing if a difference exists between the graduation rate means within the campus locations is 6.305 and is significant at the .01 level. Eta-squared can be calculated from Table 9. Campus location accounts for 1.2% of the variance in mean graduation rate.

Also, because the between group means were significantly different a post hoc test, Tukey HSD, was performed. Table 10 summarizes the comparisons. Additional information of the post hoc test can be found in Appendix G.

Table 10

Tukey HSD Significance Matrix with Multiple Comparisons on Graduation Means within Campus Location

Location	Urban	Suburban	Rural
Urban	-----		
Suburban	.002**	------	
Rural	.402	.093	------

*p<.05 **p.01

While statistical significance has been observed, the campus location variable accounts for only 1.2% on the variance in the graduation rate. There was also found significant mean differences between the Suburban and Urban locations. Although there was found a statistically significant relationship between campus location and graduation rate, the relationship was not found to be very strong when compared to the other composite variables.

6. What is the relationship between college student persistence and an institution's measures of quality and selectivity, (i.e. student characteristics, faculty characteristics)?

To respond to Research Question Six, three multiple linear regression analyses were conducted using the variables selected to define an institution's student and faculty quality and selectivity. The first analysis used the student characteristics as the independent variables and the five-year graduation rate as the dependent variable. The

second analysis used the faculty characteristics as the independent variables with graduation rate as the dependent variable. A third analysis was conducted on all the variables together defining an institution's Quality and Selectivity.

The student characteristic variables included; (a) SAT Midpoint-50th Percentile (with converted ACT included), Enrollment Yield, Percent Freshmen with a 3.0 High School Grade Point Average, and Acceptance Rate. Of the institutions in the data bank, there were 493 institutions that reported the necessary data for Student Characteristics for use in the analyses.

The first regression was obtained by regressing the four variables selected to define an institution's student quality and selectivity on the five-year graduation rate. The regression equation with all of the variables entered was significant at .01 alpha level and accounted for approximately 44% of the variance in graduation rate. As shown in Table 11, SAT Midpoint accounted for 38% of the variance. The addition of Yield added .05 to R^2 and Percent Freshmen with 3.0 High School Grade Point Average and Acceptance Rate added .01 to variance. Descriptive statistics for the sample used in the multiple regression are included in Appendix I.

Table 11

Summary of the Multiple Linear Regression of the Institution's Student Characteristics Variables x Five-year Graduation Rate (N=493)

Model	Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	SAT Midpoint	.617	.380	301.154**	.380	301.154**	.617**
2	Yield	.658	.433	186.801**	.052	45.285**	-.273**
3	Percent Fresh w/3.0 HS	.664	.440	128.327**	.008	6.890**	.475**
4	Acceptance Rate	.665	.442	96.728**	.002	1.519	-.234**

*p<.05 **p<.01

Note: Correlations can be found in Appendix H.

The faculty characteristic variables included: Percent Full-time Faculty with Doctorates, Part-time/Full-time Faculty Ratio, and Percent Part-time Faculty. There were 892 subjects who reported the necessary data for analysis.

The second regression was obtained by regressing the three variables selected to define an institution's faculty characteristics on the five-year graduation rate. The regression equation with all of the variables entered was significant at .01 alpha level and accounted for approximately 17% of the variance in graduation rate. As shown in Table 12, Percent Full-Time Faculty with Doctorates accounted for about 17% of the variance. The addition of Part-Time/Full-Time Faculty Ratio and Percent Part-time Faculty added

only an additional .002 to R^2. Descriptive statistics for the sample used in the multiple regression are included in Appendix I.

Table 12

Summary of the Multiple Linear Regression of the Institution's Faculty Characteristics Variables x Five-year Graduation Rate (N=892)

Model	Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	Percent Full-time w/Dr	.415	.173	185.533**	.173	185.533**	.415**
2	Part-time/Full-time Ratio	.417	.173	93.296**	.001	1.050	.055*
3	Percent Part-time Faculty	.417	.174	62.465**	.001	.836	-.086**

*p<.05 **p<.01

Note: Correlations can be found in Appendix H

A third regression analysis was performed on all the student and faculty characteristic variables in Table 13 to form the composite Quality/Selectivity variable.

Table 13

Summary of the Multiple Linear Regression of the Institution's Quality/Selectivity (Student and Faculty) Variables x Five-year Graduation Rate (N=435)

Model	Variables Added	R	Rsq	F	Rsqch	F(ch)	r
1	SAT Midpoint	.614	.377	262.365**	.377	262.365**	.614**
2	Yield	.657	.431	163.687**	.054	40.858**	-.297**
3	Percent Fresh w/3.0 HS	.666	.444	114.736**	.013	10.008**	.485**
4	Percent Part-time Fac	.674	.454	89.390**	.010	7.866**	.000
5	Percent Full-time w/Dr	.677	.458	72.521**	.004	3.210	.410**
6	Acceptance Rate	.679	.461	60.958**	.003	2.162	-.214**
7	Part-time/Full-time Ratio	.679	.462	52.279**	.001	.572	.005

*p<.05 **p<.01

Note: Correlations can be found in Appendix H.

This regression was obtained by regressing the seven variables in two categories of Student and Faculty Characteristics selected to define institutional quality and selectivity on the five-year graduation rate. The regression equation with all of the variables entered was significant at the .01 alpha level and accounted for approximately 46% of the variance in graduation rate. As shown in Table 13, SAT Midpoint accounted for 37.7% of the variance in graduation rate. Yield, Percent Freshmen with a 3.0 High School Grade Point

Average, and Percent Part-time Faculty accounted for about 7.7% of the variance. The addition of Percent Full-time with Doctorates, Acceptance Rate, and Part-time/Full-time Ratio added .008 to R^2. From these results, there is a statistically significant relationship between the components of the Quality/Selectivity composite variable, but there is not much gain by adding the faculty characteristics.

Summary

A number of analyses were conducted to consider the possible relationships between an institution's classification, size, wealth, complexity/diversity, campus location, quality/selectivity, and its five-year graduation rate. A series of six multiple regression analyses and two one-way analyses of variance were performed to examine the relationships that might exist between those variables.

An institution's classification was examined with the one-way analysis of variance, showing a F-statistic for testing to see if a difference exists between the mean graduation rate of the eight levels of institutional classification. The F-statistic was found to be 41.746 with a significance of less than .01. A difference in the institutional five-year graduation rate means was identified.

The regression equation for the composite Size variable was found to be significant at .01 alpha level and accounted for approximately 24% of the variance in graduation rate. The Library/Student variable accounted for about 19% of the variance with the inclusion of the remaining variables together added an additional .05 to R^2. From these results, it seems that there is a statistically significant relationship between graduation rate and the composite size variable.

The Institutional Wealth variables accounted for 43.5% on the variance in the graduation rate. Tuition and Fees per FTE Student accounted for 34.5% of that variance,

with Auxiliary and Instruction together contributing 8.4%. Student/Faculty Ratio, Student Services and Academic Services added another .005 to the variance.

The Complexity/Diversity variables accounted for 38% of the variance in the graduation rate. In this group of factors, the Percent of Commuters variable accounted for 34% of the variance in the criterion variable with the other three variables contributing a total of 3.5% of the variance.

A one-way analysis of variance was performed on the Campus Location variable, and the graduation rate means were found to be significantly different across campus location. So while statistical significance has been observed, the campus location variable accounted for only 1.2% of the variance in the graduation rate.

The variables that appeared to be the most significant were the factors that were identified to be Institutional Quality and Selectivity. They were found to account for 46% of the variance in the five-year graduation rate. The factors in this variable were divided into Student Characteristics and Faculty Characteristics. When multiple regressions were run on each group separately, the Student Characteristics accounted for 44% of the variance in the graduation rate and for the Faculty Characteristics, only 17% of the variance could be attributed to those variables. Within the Student Characteristics variables, the SAT Midpoint accounted for 38% of the variance in the graduation rate which was the most significant of the group. The Student and Faculty Characteristics analyzed together accounted for 46% of the variance in graduation rate.

In examining the specific variables, the factors that are predominate begin with the Student Characteristic of the SAT Midpoint, followed by the Wealth variable of Tuition and Fees per FTE Student. The others that should be noted include the Complexity/Selectivity variable of the Percent Commuting and the Size variable of Library Monies per FTE Student.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to examine, from a limited systemic perspective, the relationship of identified institutional characteristics to the students' ability to succeed academically. Contrary to commonly reported research examining individual student characteristics and their influence on a student's success, the focus of this study was on the institution and a selected group of variables that work together to define in institution's environment and the possible effect of those variables on students' persistence toward graduation. The characteristics that were examined are the institution's (a) Carnegie classification, (b) size, (c) wealth, (d) complexity and diversity, (e) location, and (f) quality. This study extends current research to examine the relationship of these institutional variables to retention. The problem of college student attrition considered from a limited systemic perspective was addressed in this study.

Research provides information concerning the relationship a student's environment has to his/her educational experience. Insel and Moos (1974) stated that "the way one perceives his surroundings or environment influences the way one will behave in that environment" (p. 179). Insel and Moos observed that we are affected by our environment in that our behavior can be influenced by the services and people around us. Pascarella, Terenzini, and Blimling (1994) stated that "What happens to a student after arrival on campus makes a markedly greater difference in what and how much students learn than the prestige, reputations, or resources of the institution" (p. 29).

The understanding of higher educational institutions as systems that consist of interacting parts and, therefore, affect behavior on many levels, aids in our examination of students' ability to persist toward graduation. The study of systems theory is critical when

looking at the organization of colleges and universities to explore various components of the institution.

Educational research in the field of environmental influence is leaning toward a global view in the explanations of the conditions of higher education. King (1994) reported that the knowledge base available to educators concerning systems and environments can provide tools that identify methods to improve students' learning experiences and that these tools are based in the specific components of the campus environment model.

Environmental models and the perspective of campus ecology both emphasize the interaction of the individual with his/her environment and that this interaction affects the way in which one will behave. In the examination of a student's behavior in persisting toward graduation, an environmental or ecological view of the situation is critical. An ecological approach to research where the relationship of many variables to a specific outcome is examined allows the researcher to better explain the environmental impact experienced by students.

Realizing the complexities of a student's development and acknowledging that his/her development does not occur in a vacuum must be considered (King, 1994). Realizing that progress through developmental stages does not occur independent of the environment and that the environment does impact a student's individual characteristics, it appears logical to conclude that the environment also affects some systemic variables such as retention. As research has supported, student development plays a critical part in student persistence toward graduation (Clark, Heist, McConnell, Trow, & Yonge, 1972; Hurst, 1987; Pascarella & Terenzini, 1991; Strange, 1994).

The research questions addressed in this study were:

1. What is the relationship between college student persistence and an institution's classification, (i.e. institutional type)?

2. What is the relationship be between college student persistence and an institution's size, (i.e. total FTE enrollment, number of full-time and part-time faculty, monies spent on library resources)?

3. What is the relationship between college student persistence and an institution's measures of wealth, (i.e. revenue per student, expenditure patterns, student/faculty ratio)?

4. What is the relationship between college student persistence and an institution's complexity/diversity, (i.e. percentage of minority, foreign, and commuting students)

5. What is the relationship between college student persistence and an institution' s campus location?

6. What is the relationship between college student persistence and an institution's measures of quality and selectivity, (i.e. student characteristics, faculty characteristics)?

The subjects that were used in this study come from the two databases (Integrated Postsecondary Data Systems and The College Board) that were merged together to provide data set. The selected institutions were higher education schools that confer at least a bachelor's degree in both the public and private sectors. Using the Carnegie Foundation Classification Codes, the university subjects were classified as (a) Research Universities I, (b) Research Universities II, (c) Doctoral Universities I, (d) Doctoral Universities II, (e) Master's (Comprehensive) Universities and Colleges I, (f) Master's (Comprehensive) Universities and Colleges II, (g) Baccalaureate (Liberal Arts) and Colleges I, and (h) Baccalaureate Colleges II. The data for this study were archival data obtained from the Integrated Postsecondary Education Data System, commonly known as

IPEDS, and the College Entrance Examination Board . No additional instruments or data collection procedures was necessary.

Multiple regression analyses were conducted to examine the relationship between the five-year graduation rate of the subjects and four of the six identified institutional characteristics representing the university system. Those four included; (a) institutional size, (b) institutional wealth, (c) institutional complexity and diversity, (d) campus location, and (e) institutional quality and selectivity. Analysis of variance was used for the two classification variables which were (a) classification and (b) campus location.

Discussion

The literature concerning the environmental impact on students suggests that there is a relationship between a student's behavior and the environment that they inhabit. The purpose of the study was to take selected measures of an institution's system and examine the relationships between the college environment and its five-year graduation rate. Results of this study indicated statistically significant relationships for all six composite variables to graduation rate. Terenzini and Pascarella (1994) stated that "real quality in undergraduate education resides more in an institution's educational climate and in what it does programmatically than in its stock of human, financial, and educational resources." The results of this study did not support this finding of Terenzini and Pascarella in that Student Quality characteristics and an institution's wealth were found to have a strong influence in the variance in graduation rate. Although Terenzini and Pascarella did not specifically define an "institution's educational climate", it seems reasonable that "its stock of human, financial, and educational resources" is what constitutes the "climate". This study provides strong support for the belief that the better qualified a student is for college (i.e. SAT Midpoint), the better chances they will persist to graduation. The study also

supported the hypothesis that the greater the financial resources of the institution the stronger graduation rate.

An institution's classification accounted for 22% of the variance and as stated above, Baccalaureate Colleges had the highest retention with a mean graduation rate of 75%. The Carnegie description (Integrated Postsecondary Education Data System, 1994) of these colleges states that, "These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award 40 percent or more of their baccalaureate degrees in liberal arts fields and are restrictive in admissions." Since they are "restrictive in admissions", this would support the findings in this study concerning Student Quality Characteristics and the strong relationship between SAT Midpoint and Graduation Rate.

The Size composite variable accounted for 24% of the variance in the graduation rate with monies spent on library resources per student attributing to 19% of the variance. Consistent with other findings, variables related to financial wealth seem to affect graduation rate in a dramatic way. FTE Enrollment, Number of Full-time Faculty and Number of Part-time Faculty added only 5% to the variance. This finding, regarding an institution's size, is somewhat contradictory to the expectation for the relationship between the institution's classification and its graduation rate. Baccalaureate I colleges had the strongest relationship in regards to graduation rate, yet this classification of institutions tends to be smaller in size. It seems apparent something unique is happening in Baccalaureate I colleges that is minimally related to size. Other factors than just an institution's size could affect graduation rate in a greater way.

An institution's wealth was also found to be significant with 43% of the variance in graduation rate attributed to this variable. Six variables were used to define this composite variable, and Tuition and Fees per Student accounted for 34.5% of the

variance. This finding could point to two influences in persistence: (a) that the more a student pays for tuition and fees to attend a college of their choice, the harder they will work to persist toward graduation, and (b) the greater the tuition and fees per student, the more financial resources available for academic and support services for the student. This finding supports the observation by St. John, Paulsen, and Starkey (1996) that the costs associated with attending a college had a direct effect on persistence.

Complexity and Diversity accounted for 38% of the variance with Percent Commuting being the strongest of the three variables. Percent Commuting accounted for 34% of the variance. This finding, concerning the Percent Commuting, supports the idea that on-campus living has a profound effect on students and can encourage their pursuit of a degree. This could also indicate the level of impact environment has on student that reside on campus. This supports Strange's (1994) observation that "the college environment positively influences student development through physical features that are enabling; aggregate characteristics that are attractive, satisfying, and reinforcing; and organizational structures that are open and dynamic" (p. 409). This finding also can be misleading in that students that choose or must commute, tend to graduate in more than the tradition four to five years. A look at a six-year graduation rate might render different results with this population.

Although the results were statistically significant concerning Campus Location, this variable accounted for only 1.2% of the variance in graduation rate. The results of this study implies that whether a campus is located in an urban, suburban, or rural setting, the institution's graduation rate is not affected to a great degree.

Nemko (1991) stated that "The caliber of fellow students affects a person's college experience more than any other factor. Good students raise the level of instruction, the quality of discussions..., the atmosphere in the residence halls and ultimately the value that

employers place on the institution's diploma" (p. 77). This statement was found to be true in the current study. When the regression analysis was run for an institution's quality and selectivity, it was found to account for 46% of the variance in graduation rate. Even though seven variables were used to define this composite variable, the SAT Midpoint for incoming students was by far the most significant influence with 37.7% of the variance in graduation rate attributed to this variable. The higher the quality of students that are admitted as freshmen, the higher the institutional five-year graduation rate. This finding supports Grunig (1997) when he reported that high selectivity in admission policies was found to be the most important characteristic of institutions that receive high overall undergraduate educational quality rating.

Even with the findings in this study that revealed a strong relationship between Graduation Rate and SAT Midpoint, Percent Commuting, and Tuition and Fees per Students were significant, they were not surprising. The surprising element to what might have been expected were the variables that did not stand out as strong influences in the persistence to graduation. The composite variable of Institutional Size only accounted for 24% of the variance in graduation rate. With the removal of the variable Library Monies per Student from the composite, FTE Enrollment, Total Part-time Faculty, and Total Full-time Faculty only accounted for 9.4% of the variance in graduation rate. Related to this issue was the fact that the Student/Faculty Ratio variable, in the Wealth composite, also was not found to be a strong influence. It's presence in the composite Wealth variable added only .004 to the R-squared. It seems reasonable to assume that the smaller the student body and the larger the faculty to serve the students, the better quality education would be provided thus encouraging the student to graduate. This assumption was not strongly affirmed in this study. This finding could imply that even with a low

student/faculty ratio, other factors, such as incoming SAT, residential status, and monies put into the university have greater influence.

Another variable that did not yield strong results was the Faculty Characteristics which included Percent Full-time Faculty with Doctorates, Percent of Part-time Faculty, Full-time/Part-time Faculty Ratio. Although it was found to be significant, this variable account for only 17.4% of the variance in graduation rate. Full-time Faculty with Doctorates was the most significant factor in this composite accounting for 17.3% of the variance. It seems that it would be reasonable to assume, from observation and logic, that when a faculty, as a group, consist of a greater number of part-time members, the quality of education would suffer due to the assumed lack of experience in teaching and the possible disjointed unity in the staff. This assumption was not strongly supported in this study. The findings did show a negative relationship between the amount of part-time faculty and an institution's graduation rate, but the amount of variance was extremely weak. These results could imply that part-time faculty are often as beneficial as full-time faculty in regard to assisting students in their pursuit of a degree. It is possible that part-time faculty compliment the skills and abilities present in the full-time faculty.

Recommendations for Research

The following research recommendations are presented as a result of the study:

1. Realizing that the scope of variables presented a limited definition of the higher education system in this study, it is recommended future research continue to expand the examination into other aspects of the university system and how it affects students, employees, cities, and society.

2. Also, redefinition of the composite variables in this study with other sources of data is needed to confirm the findings in this research.

3. It is recommended that future researchers access the pre-existing databases that collect information on higher education institutions. There are many advantages to this process; (a) the data is already collected, (b) the data is in a usable format for many computer packages, and (c) the data is updated regularly.

4. It is recommended that researchers continue to try to access organizational variables that work together in defining the higher educational institution. A major obstacle is the difficulty in assessing organizational variables

Recommendations for Practice

The following recommendations for practice are presented as a result of the study:

1. An examination of the interrelated position of the higher education organization provides information that can be used by administrators and student personnel staff in shifting their theoretical bases when working with students. Gallessich (1989) observed that the student personnel profession has always been aware of the fact that predominated sources of student obstacles are environmental in nature. But, even with this information, our professional philosophy, current knowledge base, and day-to-day skills continue to look at individual student characteristics instead of possible changes in the environment.

2. The findings in this study suggest that an institution's admission policies affect their graduation rate. If retention is a concern, then these policies must be examined especially in the area of academic readiness of the incoming students.

3. Liberal Arts Colleges where the major emphasis is on baccalaureate degree programs and where restrictive admissions are required, appear to have the highest effect on graduation rate when compared to other classifications of institutions. If larger state universities are committed to a more open admissions policy, then a lower graduation rate should be understood. An egalitarian admissions policy, or the commitment to provide everyone the opportunity to a higher education, does not generate high graduation rates.

Instead, offering a chance at education to those who might not have the opportunity is valued over restrictive admissions standards. In this setting, as oppose to a more selected student population, more students do not complete their degree. Having an open admissions policy in order to provide educational opportunities for many is a worthy mission for many educational institutions.

4. The findings within the institutional classification variable indicate that size does make a difference. The largest five-year graduation rate was attributed to the Baccalaureate I institutions which tend to be smaller, liberal arts colleges. These results may be reflective of an admissions policy issue rather than one of size.

5. The findings in this study support on-campus living in that institutions with a large commuting student population tended to have smaller five-year graduation rates. Since is seems that living on campus helps to promote persistence toward graduation, it is recommended that institutions re-evaluate their on-campus housing and build a program that encourages students to take advantage of this resource.

Conclusions

The challenge of retaining students throughout their college experience is a historical discussion that has left many student personnel administrators rushing around, working to make their campuses "user friendly" so as to do everything possible to make the experience smooth for the students. The question that seems to be more appropriate is: "How is the college experience made more meaningful and not necessarily smoother or easier?" A "meaningful experience" is not one where a student is taken by the hand and walked through the process of education. A true "meaningful experience" comes after trials involving problem-solving, relationship building, persistence through failure, and the facing of challenges that cause students to reach deep inside and learn to succeed.

It is recognized that not all students are at the same tenacity level as one another. This is the challenge and the question that administrators must ask: How does the institution balance providing necessary assistance with allowing the student to face challenges on their own in the educational process? What personal attributes do students need to develop before they graduate and what type of program would encourage that development?

Low graduation rates must not determine the level of nurturing needed to assist the student in the total education process. Education should not become an easy commodity but, instead, should encourage student in the development of their character and stamina. A diploma should represent more than just in-class learning. It should speak to the persistence of a student to overcome obstacles to the learning process.

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APPENDIXES

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL

AND CONSENT FORM

OKLAHOMA STATE UNIVERSITY
INSTITUTIONAL REVIEW BOARD

DATE: 10-15-98 **IRB #: ED-99-035**

Proposal Title: THE RELATIONSHIP OF ENVIRONMENTAL PREDICTORS AND INSTITUTIONAL CHARACTERISTICS TO STUDENT PERSISTENCE

Principal Investigator(s): Marcia Dickman, Connie E. Sjoberg

Reviewed and Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Signature: Carol Olson Date: October 19, 1998

Carol Olson, Director of University Research Compliance
cc: Connie E. Sjoberg

Approvals are valid for one calendar year, after which time a request for continuation must be submitted. Any modification to the research project approved by the IRB must be submitted for approval. Approved projects are subject to monitoring by the IRB. Expedited and exempt projects may be reviewed by the full Institutional Review Board.

APPENDIX B

CARNEGIE FOUNDATION CLASSIFICATION CODES

Carnegie Foundation Classification Codes

11 - RESEARCH UNIVERSITIES I

These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees each year. In addition, they receive annually $40 million or more in federal support.

12 - RESEARCH UNIVERSITIES II

These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority to research. They award 50 or more doctoral degrees each year. In addition, they receive annually between $15.5 million and $40 million in federal support.

13 - DOCTORAL UNIVERSITIES I

These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate. They award at least 40 doctoral degrees annually in five or more disciplines.

14 - DOCTORAL UNIVERSITIES II

These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate. They award annually at least 10 doctoral degrees (in three or more disciplines), or 20 or more doctoral degrees in one or more disciplines.

21 - MASTER'S (COMPREHENSIVE) UNIVERSITIES AND COLLEGES I

These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 40 or more master's degrees annually in three or more disciplines.

22 - MASTER'S (COMPREHENSIVE) UNIVERSITIES AND COLLEGES II

These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 20 or more master's degrees annually in one or more disciplines.

31 - BACCALAUREATE (LIBERAL ARTS) COLLEGES I

These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award 40 percent or more of their baccalaureate degrees in liberal arts fields and are restrictive in admissions.

32 - BACCALAUREATE COLLEGES II

These institutions are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. They award less than 40 percent of their baccalaureate degrees in liberal arts fields or are less restrictive in admissions.

APPENDIX C

INTEGRATED POSTSECONDARY EDUCATIONAL DATA SYSTEMS

VARIABLES DICTIONARY

Integrated Postsecondary Educational Data Systems Variables Dictionary

ACADEMIC SUPPORT (EXPENDITURES). Expenditures for the support services that are an integral part of the institution's primary mission of instruction, research, and public service. Includes expenditures for libraries, museums, galleries, audiovisual services, academic computing support, ancillary support, academic administration, personnel development, and course and curriculum development. Also includes expenditures for veterinary and dental clinics if their primary purpose is to support the institutional program.

AUXILIARY ENTERPRISES (EXPENDITURES). Expenditures for essentially self-supporting operations of the institution that exist to furnish a service to students, faculty, or staff, and that charge a fee that is directly related to, although not necessarily equal to, the cost of the service. Examples are residence halls, food services, student health services, college stores, and barber shops.

INSTRUCTION (EXPENDITURES). Expenditures of the colleges, schools, departments, and other instructional divisions of the institution and expenditures for departmental research and public service that are not separately budgeted. Includes expenditures for credit and non-credit activities. Excludes expenditures for academic administration where the primary function is administration (e.g., academic deans). Also includes general academic instruction, occupational and vocational instruction, special session instruction, community education, preparatory and adult basic education, and remedial and tutorial instruction conducted by the teaching faculty for the institution's students.

STUDENT SERVICES (EXPENDITURES). Funds expended for admissions, registrar activities, and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the

context of the formal instructional program. Examples are career guidance, counseling, financial aid administration, and student health services (except when operated as a self-supporting auxiliary enterprise).

TUITION AND FEES (REVENUES). Revenues from charges assessed against students for educational purposes. Includes tuition and fee remissions or exemptions even though there is no intention of collecting from the student. Includes those tuition and fees that are remitted to the state as an offset to the state appropriation. Excludes charges for room, board, and other services rendered by auxiliary enterprises.

APPENDIX D

TREATMENT OF OUTLIERS

Treatment of Outliers

Within certain composite variables there existed outliers, or institutions whose data results were extreme compared to other institutions, that were believed to be the result of either missed keyed information in the database or were institutions where their data in question was consider outside reasonable expectations. Since the focus of this study was to observe general trends in most universities, it was determined that some institutions would be eliminated as outliers. The following table details the parameters that were selected for the omission of outliers. For detail names of institutions that were omitted for the composite variables Size and Wealth, refer to Appendix E.

Parameters for the Omission of Outliers in Selected Variables

Variables	Parameters
Size	
Total FTE Enrollment	0 - 20,000
Total Full-time Faculty	0 - 2,500
Total Part-time Faculty	0 - 1,200
Library Resources/Student	0 - $3,400
Wealth	
Tuition & Fees/Student	0 - $35,000
Instruction/Student	0 - $20,000
Academic/Student	0 - $6,000
Student Services/Student	0 - $5,000
Auxiliary Services/Student	0 - $10,000
Student/Faculty Ratio	0 - 50
Complexity/Diversity	
Percent Minority	0 - 100
Percent Foreign	0 - 20
Percent Commuting	0 - 100
Location	N/A
Quality/Selectivity	
SAT Midpoint	N/A
Acceptance Rate	N/A
Yield Rate	N/A
Percent Fresh w/3.0 H.S	N/A
Percent Full-time Fac w/Dr	N/A
Percent Part-time Faculty	N/A
Full/Part-time Fac Ratio	0 - 4

APPENDIX E

DELETION OF OUTLIERS

Deletion of Outliers

With the deletion of outliers and running the statistical analyses, the following table reveals the total number of subjects available for each variable before the outliers were omitted, the total number of variables after the outliers were omitted and the total number of subjects that had complete data for use in the analyses. The Quality/Selectivity composite variable had a noticeably lower number of subjects for the regression analysis due to the increase of missing reported data in the Student Characteristic variables (SAT midpoint, Acceptance Rate, Yield Rate, Percent of Freshmen with 3.0 High School GPA) that are a part of this composite variable.

Total Number of Subjects for each Composite Variable

Variables	Total Subjects Before Outliers Omitted	Total Subjects After Outliers Omitted	N for Analysis
Classification	1311	1311	1023
Size			
Total FTE Enrollment	1311	1271	959
Total Full-time Faculty	1303	1263	959
Total Part-time Faculty	1273	1238	959
Library Resources/Student	1304	1264	959
Wealth			
Tuition & Fees/Student	1307	1248	940
Instruction/Student	1304	1245	940
Academic/Student	1304	1245	940
Student Services/Student	1304	1245	940
Auxiliary Services/Student	1304	1245	940
Student/Faculty Ratio	1270	1216	940
Complexity/Diversity			
Percent Minority	1278	1278	932
Percent Foreign	1194	1194	932
Percent Commuting	1290	1290	932
Location	1311	1311	1023
Quality/Selectivity			
Student Characteristics			
SAT Midpoint	1020	1020	493
Acceptance Rate	960	960	493
Yield Rate	958	958	493
Percent Fresh w/3.0 H.S	771	771	493
Faculty Characteristics			
Percent Full-time Fac w/Dr	1211	1211	892
Percent Part-time Faculty	1269	1269	892
Full/Part-time Fac Ratio	1214	1214	892
Total Composite Variable	------	------	435

Listing of Institutional Outliers that were Deleted for the Size Variables

Fice #	Inst ID #	Name	Class	FTE Enrollment
6883	4852089000	Ohio SU Columbus	10	33040.67
3658	6875011900	U Texas Austin	10	31746.67
3329	1837139800	Penn State U Park	10	29613.00
2290	2765190700	Michigan SU	10	28013.33
3670	1845147600	Brigham Young U	30	26795.67
1825	2660175500	Purdue U	10	26788.00
1775	1592161900	U Illinois Urbana	10	25725.67
1535	6373137500	U Florida	10	25215.00
1081	3092106400	Arizona SU	20	25121.33
3895	2927169600	U Wis Madison	10	25066.00
1809	4586159600	Ind U Bloomington	10	23491.33
1083	4034093100	U Arizona	10	23300.00
1315	2143118100	U Calif Los Angeles	10	22892.00
3652	1479154800	U Houston	30	22126.00
3798	2926206100	U Washington	10	21883.33
1312	4075089600	U Calif Berkeley	10	21713.00
2972	3915080900	North Car SU	10	21372.67
2103	2170190300	U Maryld Coll Park	10	20670.33
1598	4531022600	U Georgia	10	20469.00

Fice #	Inst ID #	Name	Class	Total Faculty
3379	5815099300	Univ of Pittsburgh	10	2993
3969	2928120700	U Minn Twin Cities	10	2760
3378	5814155200	U Pennsylvania	10	2611
1328	5156060300	U Southern Calif	10	2519
1426	1324115700	Yale Univ	10	2513

Fice #	Inst ID #	Name	Class	Part-time Faculty
2785	4836087900	New York Univ	10	3521
2506	6826194700	St Louis Univ	30	1709
11460	2642080800	National U	50	1698
2199	4355018700	Northeastern U	40	1647
2520	4704069800	Washington U	10	1515

Fice #	Inst ID #	Name	Class	Library/Student
2707	4832058800	Columbia U	10	8377.14
2155	2384190500	Havard/Radcliffe C	10	6738.30
1305	1105094100	Stanford U	10	6401.97
2627	2548185600	Princeton U	10	5699.43
3051	4860086400	Kent S U	30	5411.54
1774	1565118400	U Chicago	10	5400.79
4484	4953200000	John F Kennedy U	60	5391.78
1131	2074061400	Cal Inst Tech	10	5060.00
2077	2839190200	John Hopkins U	10	4441.00
1572	2312183000	Georgia Southern U	50	4143.44
2780	2753100300	Eugene Lang/New S	40	4024.25

Listing of Institutional Outliers that were Deleted for the Wealth Variables

Fice #	Inst ID #	Name	Class	Tuition & Fees/Student
2780	2753100300	Eugene Lang/New Sch	40	199309.40
2707	4832058800	Columbia U Columb C	10	80760.95
2160	1341249400	Lesley C	50	71178.76
1774	1565118400	U Chicago	10	55418.13
2155	2384190500	Harvard/Radcliffe C	10	51236.98
2077	2839190200	Johns Hopkins U	10	51111.84
1158	1069045000	US International U	30	44146.79
2178	2736318200	MIT	10	42469.06
10149	3920183500	Pepperdine U	40	39363.87
1444	5219101800	George Washington U	20	37803.22
10923	4007084400	Union I	30	37304.29
3378	5814155200	U Pennsylvania	10	36775.51
1739	5496161700	Northwestern U	10	36357.30
2903	1833032300	Yeshiva U	10	36172.36
1305	1105094100	Stanford U	10	35359.05

Fice #	Inst ID #	Name	Class	Instruction/Student
1131	2074061400	Cal Inst Tec	10	91874.44
2520	4704069800	Washington U	10	71184.92
2911	1443021400	Bennett C	80	67677.50
3051	4860086400	Kent SU	30	63427.22
1426	1324115700	Yale U	10	60896.48
2978	4851029100	Wake Forest U	50	56816.34
1572	2312183000	Georgia Southern U	50	52187.25
1564	6306126200	Emory U	20	38581.55
2920	4841095700	Duke U	10	34056.61
2894	1832116400	U Rochester	10	33908.81
2785	4836087900	New York U	10	31378.90
3271	6872157300	Hahnemann U Hth Sc	40	28280.59
3024	5813005700	Case West Resrve U	10	27486.03
1509	1318233200	Nova Southeastern U	30	26894.20
3242	6681106700	Carnegie Mellon U	10	26247.79
2542	2558134500	Creighton U	50	25648.68
3604	6481057100	Rice U	30	25564.44
2506	6826194700	St Louis U	30	24659.73
3535	6874150000	Vanderbilt U	10	24229.38
4058	6544171200	Gratz C	80	22585.38

2029	6609203000	Tulane U	30	22515.86
2627	2548185600	Princeton U	10	22455.49
1445	5246016000	Georgetown U	20	20510.88
1328	5156060300	U Southern Calif	10	20025.85

Fice #	Inst ID #	Name	Class	Academic/Student
4484	4953200000	John F Kennedy U	60	19771.51
2219	6629055400	Tufts U	30	10271.59
2573	6474163600	Dartmouth C	40	9802.33
2704	2267921800	C New Rochelle	50	9259.11
1205	4389090800	Golden Gate U	50	7824.36
3969	2928120700	U Minn Twin Cities	10	6615.89
1315	2143118100	U Calif Los Angeles	10	6514.76
1317	2142113200	U Calif San Diego	10	6328.27
1937	5120192800	Ottawa U	60	6277.77
2521	4557095500	Webster U	50	6204.72

Fice #	Inst ID #	Name	Class	Student Services/Student
13022	6975137200	City U	60	9743.89
1389	1067155900	Holy Apstles C/Sem	80	6818.18
2731	1392117100	Hobart C	70	6675.76
1858	1253122600	Divine Word C	80	5922.89
2667	5372058300	Dowling C	60	5195.56
1416	1118058900	U Bridgeport	50	5096.67
2791	1638032500	Pace U	50	5079.09
1322	4671090900	U Redlands	50	5043.46

Fice #	Inst ID #	Name	Class	Auxiliary Services/Student
2974	5812044300	U North Car Chpl Hll	10	14053.58
1840	1559114100	U Notre Dame	30	11201.54

APPENDIX F

ADDITIONAL COMPARISONS ON INSTITUTIONAL CLASSIFICATION

Additional Comparisons on Institutional Classification using Tukey HSD

Classification		Mean Difference	Std. Error	Sig.
10-Research I	20	10.13	3.549	.082
	30	7.38	3.305	.333
	40	11.58	3.171	.006**
	50	18.58	2.264	.000**
	60	12.81	2.494	.000**
	70	-9.53	2.563	.005**
	80	14.62	2.272	.000**
20-Research II	30	-2.76	3.877	.997
	40	1.45	3.763	1.000
	50	8.44	3.039	.100
	60	2.68	3.214	.991
	70	-19.66	3.267	.000**
	80	4.49	3.045	.822
30-Doctorate I	40	4.21	3.534	.935
	50	11.20	2.751	.001**
	60	5.43	2.943	.588
	70	-16.91	3.001	.000**
	80	7.24	2.757	.146
40-Doctorate II	50	6.99	2.588	.122
	60	1.22	2.791	1.000
	70	-21.12	2.852	.000**
	80	3.04	2.595	.940
50-Masters I	60	-5.77	1.693	.015*
	70	-28.11	1.791	.000**
	80	-3.95	1.344	.065
60-Masters II	70	-22.34	2.075	.000**
	80	1.81	1.703	.964
70-Bacc. I	80	24.15	1.802	.000**
80-Bacc. II				

* $p<.05$ ** $p<.01$

APPENDIX G

ADDITIONAL COMPARISONS ON CAMPUS LOCATION

Additional Comparisons on Campus Location using Tukey HSD

Location		Mean Difference	Std. Error	Sig.
1-Urban	2	-4.88	1.416	.002**
	3	-2.01	1.563	.402
2-Suburban	1	4.88	1.416	.002**
	3	2.86	1.373	.093
3-Rural	1	2.01	1.563	.402
	2	-2.86	1.373	.093

*p<.05 **p<.01

APPENDIX H

PEARSON'S CORRELATIONS ON COMPOSITE VARIABLES

Pearson's Correlations on Composite Variable

Size

	GR	FTE	FTFA	PTFA	LIBST
Graduation Rate	1.00				
FTE Enrollment	-.059*	1.00			
Full-time Faculty	-.001	.164**	1.00		
Part-time Faculty	-.134**	.151**	.516**	1.00	
Library Monies/Stud	.122**	.050	.035	.054*	1.00

* p<.05 **p<.01

Wealth

	GR	TFS	IS	AS	STS	AUX	SFR
Graduation Rate	1.00						
Tuition & Fees/Student	.588**	1.00					
Instruction/Student	.335**	.612**	1.00				
Academic Support/Student	.295**	.491**	.744**	1.00			
Student Services/Student	.412**	.739**	.425**	.392**	1.00		
Auxiliary Services/Student	.526**	.503**	.506**	.502**	.393**	1.00	
Student/Faculty Ratio	-.282**	-.550**	-.584**	-.493**	-.522**	-.397**	1.00

p<.05 **p<.01

Complexity/Diversity

	GR	%MIN	%FOR	%COM
Graduate Rate	1.00			
Percent Minority	-.189**	1.00		
Percent Foreign	.128**	.085**	1.00	
Percent Commuter	-.587**	.161**	-.111**	1.00

p<.05 **p<.01

Quality/Selectivity: Student

	GR	SAT	AR	PF	EY
Graduation Rate	1.00				
SAT Midpoint	.617**	1.00			
Acceptance Rate	-.234**	-.345**	1.00		
Percent Freshmen w/3.0 HS GPA	.475**	.666**	-.287**	1.00	
Enrollment Yield	-.273**	-.072	-.077*	-.037	1.00

p<.05 **p<.01

Quality/Selectivity: Faculty

	GR	FD	PF	PFR
Graduation Rate	1.00			
Percent Full-time w/Dr	.415**	1.00		
Percent Part-time Faculty	-.086**	-.142**	1.00	
Part-time/Full-time Ratio	.055*	.058*	.014	1.00

p<.05 **p<.01

Student and Faculty Quality/Selectivity

	GR	SAT	AR	%FR	Y	%PF	%FT	PFR
Graduation Rate	1.00							
SAT Midpoint	.614**	1.00						
Acceptance Rate	-.214**	-.292**	1.00					
Percent Fresh w/3.0 HS	.485**	.657**	-.234**	1.00				
Yield	-.297**	-.108*	-.035	-.055	1.00			
Percent Part-time Faculty	.000	-.172**	.102*	-.169**	-.050	1.00		
Percent Full-time w/Dr	.410**	.487**	-.117**	.391**	-.268**	-.118**	1.00	
Part/Full-time Ratio	.005	.045	-.118**	.056	.049	.027	.050	1.00

p<.05 **p<.01

Peaarson's Correlations on All Variables

	GRADRA	CLASS	FTEENR	FTFAC	PTFAC	LIBST	TUIFEE	INSTRST	ACADST	STSERST	AUXST	STFACRA
GRADRAT	1.000											
CLASS	.007	1.000										
FTEENR	-.150**	-.750**	1.000									
FTFAC	-.043	-.746**	.883**	1.000								
PTFAC	-.119**	-.492**	.503**	.467**	1.000							
LIBST	.336**	-.369**	.041	.246**	.181**	1.000						
TUIFEEST	.367**	-.063	-.201**	-.095*	-.004	.563**	1.000					
INSTRST	.235**	-.365**	.051	.211**	.155**	.831**	.624**	1.000				
ACADST	.221**	-.418**	.146**	.330**	.218**	.825**	.684**	.774**	1.000			
STSERST	.276**	.099*	-.338**	-.182**	-.061	.651**	.748**	.604**	.674**	1.000		
AUXST	.343**	-.301**	.062	.256**	.731**	.731**	.285**	.561**	.601**	.472**	1.000	
STFACRAT	-.272**	.107*	.090*	-.206**	-.181**	-.492**	-.308**	-.371**	-.420**	-.440**	-.423**	1.000
PCTMIN	-.107*	-.096*	.043	.063	.096*	.094*	.055	.113*	.157**	.058	-.025	-.040
PCTFOR	.043	.005	-.135**	-.088*	.057	.160**	.240**	.135**	.156**	.212**	.019	-.180**
PCTCOM	-.540**	-.383**	.426**	.329**	.382**	-.097*	-.189**	-.010	.009	-.287**	-.258**	.149**
LOC	-.055	.248**	-.143**	-.191**	-.284**	-.208**	-.174**	-.195**	-.226**	-.072	-.062	.271**
SATMP	.608**	-.237**	.097*	.201**	.031	.447**	.314**	.349**	.355**	.214**	.397**	-.315**
ACCRATE	-.242**	.200**	-.126**	-.183**	-.093*	-.265**	-.068	-.237**	-.215**	-.060	-.184**	.072
PCTFRHS	.488**	-.211**	.109*	.165**	.027	.305**	.233**	.216**	.264**	.153**	.254**	-.258**
YIELD	-.273**	-.051	.105*	.079	.032	-.138**	-.188**	-.100*	-.109*	-.204**	-.142**	.089*
PCTFTDR	.394**	-.363**	.226**	.262**	.174**	.426**	.271**	.303**	.374**	.223**	.366**	-0.218
PCTPRFAC	.000	.265**	-.321**	-.353**	.287**	-.068	.179**	-.016	-0.03	.146**	-0.14	-0.108
PTFTRATIO	-.009	-.083*	.078	.116**	.087*	.084*	-.008	.034	.090*	-.005	-.043	-.065

*p<.05 **p<.01

Pearson's Correlations on All Variables, continued

	PCTMIN	PCTFOR	PCTCOM	LOC	SATMP	ACCRATE	PCTFRHS	YIELD	PCTFTDR	PCTPTFAC	PTFTRATI
GRADRAT											
CLASS											
FTEENR											
FTFAC											
PTFAC											
LIBST											
TUIFEEST											
INSTRST											
ACADST											
STSERST											
AUXST											
STFACRAT											
PCTMIN	1.000										
PCTFOR	.144**	1.000									
PCTCOM	.202**	.003	1.000								
LOC	-.239**	-.077	-.237**	1.000							
SATMP	-.092*	.024	-.354**	-.134**	1.000						
ACCRATE	-.254**	.005	.029	.103*	-.310**	1.000					
PCTFRHS	-.033	.000	-.216**	-.171**	.659**	-.239**	1.000				
YIELD	-.072	-.037	.237**	.041	-.107*	-.018	-.060	1.000			
PCTFTDR	.051	.055	-.143**	-.223**	.494**	-.148**	.400**	-.234**	1.000		
PCTPRFAC	.010	.115**	.126**	-.168**	-.179**	.089*	-.161**	-.047	-.128**	1.000	
PTFTRATIO	.095*	.001	.087*	-.084*	.025	-.118**	.048	.051	.031	.030	1.000

*p<.05 **p<.01

APPENDIX I

DESCRIPTIVES ON COMPOSITE VARIABLES

Descriptives on Composite Variables

Institutional Classification	N
10-Research I	63
20-Research II	32
30-Doctorate I	40
40-Doctorate II	46
50-Masters I	302
60-Masters II	135
70-Baccalaureate I	115
80-Baccalaureate II	290
Total	1023

Size Variables	N	Minimum	Maximum	Mean	SD
FTEENR	1271	.00	19685.33	3599.6567	4004.5481
FTFAC	1263	7	2297	246.80	326.12
PTFAC	1238	1	1085	110.60	144.12
LIBST	1264	.00	3310.93	510.5422	427.7196

Wealth Variables	N	Minimum	Maximum	Mean	SD
TUIFEEST	1248	380.74	32656.38	7608.9779	5507.8728
INSTRST	1245	.00	18746.16	5164.8180	2670.7691
ACADST	1245	.00	5509.76	1181.5155	821.9087
STSERST	1245	.00	4915.81	1335.0640	760.5881
AUXST	1245	.00	9291.95	2255.3196	1487.1702
STFACRAT	1216	.00	47.39	13.8171	4.8738

Comlpexity/Div	N	Minimum	Maximum	Mean	SD
PCTMIN	1278	1	100	21.00	24.16
PCTFOR	1194	1	57	3.68	4.43
PCTCOM	1290	1	100	53.64	28.36

Campus Location	N
1-Urban	370
2-Suburban	580
3-Rural	361
Total	1311

Quality/Sel	N	Minimum	Maximum	Mean	SD
SATMP	1020	620.00	1405.00	984.1127	126.2800
ACCRATE	960	.00	1.00	.7366	.1584
PCTFRHS	771	2	100	57.30	22.32
YIELD	958	10	136	44.14	16.13
PCTFTDR	1211	2.85	105.13	69.6238	18.6514
PCTPTFAC	1269	.43	96.15	33.3015	18.3711
PTFTRATI	1214	.00	3.99	.6131	.5587

VITA

Constance E. Sjoberg

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE RELATIONSHIP OF ENVIRONMENTAL PREDICTORS AND INSTITUTIONAL CHARACTERISTICS TO STUDENT PERSISTENCE

Major Field: Applied Behavioral Studies

Emphasis: Student Personnel Administration

Biographical:

Personal Data: Born in Little Rock, Arkansas, On February 11, 1954, the daughter of John and Sally Taylor.

Education: Graduated from Northeast High School, North Little Rock, Arkansas in May 1972; received Bachelor of Arts degree in Music Education from Oral Roberts University in May 1977; received Master of Science in Counseling and Student Personnel from Oklahoma State University in May 1990. Completed the requirements for the Doctor of Philosophy degree with a major in Applied Behavioral Studies with an emphasis in Student Personnel Administration at Oklahoma State University in May 1999.

Experience: Resident Hall Director at Oral Roberts University, August 1980 to July 1984; Assistant Dean of Women at Oral Roberts University, August 1984 to July 1987; Academic Counselor and Advisor for International Students at Tulsa Community College, July 1990 to June 1993; Assessment Specialist for Turner Unified School District, September 1998 to present.

Professional Memberships: National Association of Student Personnel Administrators; American Educational Research Association; Association of Christians in Student Development