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AN ANALYSIS OF EXPENDITURES ON STUDENT AFFAIRS / SERVICES AND COLLEGE STUDENT RETENTION AT FOUR-YEAR COLLEGES AND UNIVERSITIES IN THE UNITED STATES

Jason Umfress

Clemson University, jumfress@coker.edu

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AN ANALYSIS OF EXPENDITURES ON STUDENT AFFAIRS / SERVICES AND
COLLEGE STUDENT RETENTION AT FOUR-YEAR COLLEGES AND
UNIVERSITIES
IN THE UNITED STATES

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy
Educational Leadership (Higher Education)

by
Jason Walter Umfress
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Accepted by:
Dr. Pamela A. Havice, Committee Chair
Dr. David E. Barrett
Dr. Tony W. Cawthon
Dr. James W. Satterfield, Jr.

ABSTRACT

The purpose of this study was to explore the relationship between expenditures for student affairs / services and college student retention rates. Data reported to the Integrated Postsecondary Education Data Set (IPEDS) for the 2007-2008 academic year were used. Public and private-not-for-profit institutions in the United States that completed the IPEDS survey we included in the population and analysis.

A multiple regression analysis was conducted, controlling for institutional size, institutional control, institutional mission, institutional selectivity, and non-student affairs / services expenditures. The study found that expenditures for student affairs / services were a significant predictor of college student retention rates, even when other important institutional characteristics were controlled. According to the findings, institutional selectivity was discovered to be the strongest predictor of college student retention, followed by expenditures for student affairs / services. Institutional control was found to be the third best indicator for college student retention, and institutional expenditures other than those for student affairs / services were the fourth best predictor. Institutional size and institutional mission were not found to be significant indicators for student retention.

Recommendations for theory, research, and practice were discussed based on the results of the study. This study narrowed the scope of previous research, utilized more recent data sources, and accounted for different control variables in an attempt to add to the future construction of a conceptual model of the relationship among institutional expenditures and student outcomes.

DEDICATION

I would like to dedicate this work to my brother, and guardian angel, James Wesley “Jamie” Umfress (1970-1988). I love you and think of you often.

ACKNOWLEDGMENTS

This project would not have been possible without the love and support of many people. First, I would like to thank my dissertation committee for their wisdom and guidance. Dr. Pamela Havice, my committee chair, thank you for your unwavering support, friendship, and faith in my abilities. You believed in me when I did not believe in myself. This dream would have never come to fruition without you. Dr. David Barrett, your patience has no end. I am thankful for you teaching me that statistics is not just something in a textbook, but a powerful tool we use to answer difficult questions. Dr. James Satterfield, you are “my guy.” Thank you for expanding my view of the world and helping me see the big picture. Dr. Tony Cawthon, I am proud to call you teacher, advisor, colleague, and friend. Thank you for your keen eye and for keeping me focused on what is important. I consider myself very fortunate to have had such a supportive and committed group of faculty with which to work. Each of you contributed positively to my Clemson experience, and I will be forever grateful.

To my family and friends, thank you for celebrating my victories and supporting me in my defeats through this process. My parents, Jimmy and Jacque Umfress, are the wisest people I know. Thank you for your unending love and support as I continue to figure out what I want to be when I grow up. Roger Harrison, you were instrumental in helping me discover who I am through this process and beyond. Your love and support was key to my success. Julie Green, Elaine Hiott, and Justin Owens kept me sane by refusing to let me take myself too seriously. Thank you for your love, laughter, wings,

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CHAPTER ONE

INTRODUCTION

Accountability has been a central theme in higher education finance since the end of the 1950's. After the political unrest of the 1960's, higher education in the United States entered the "Era of Adjustment and Accountability" (Thelin, 2003). With fluctuating economies and declining funding from state tax dollars, states made sweeping changes in statewide governance, creating structures to control decision making and allocation processes at public institutions (McLendon, Hearn, & Deaton, 2006).

In 2005, the National Commission on Accountability in Higher Education called for more specific, streamlined methods to assess institution efficiency. The new accountability movement shared focus on institutional inputs and educational outcomes. Colorado, Florida, Kansas, South Dakota, Tennessee and Texas have turned to the evaluation of performance indicators, such as college student retention and graduation rates, undergraduate access, campus diversity, and job placement rates, as a method of accountability and means of measuring efficiency (Burke & Miassians, 2003; McLendon, Hearn, & Deaton, 2006). In an attempt to answer the call of accountability, data-driven comparisons between institutional inputs, such as allocations and expenditures of funds, and outputs, such as student educational outcomes, have been used to make inferences about current funding structures.

Limited research exists on the relationship between student outcomes and institutional expenditures (Rock, Centra, & Linn, 1970; Astin, 1993; Hayek, 2001; Toutkoushian & Smart, 2001; Ryan, 2004; Ryan, 2005; Gansemer-Topf & Schuh, 2006;

Pike, Smart, Kuh, & Hayek, 2006). Institutional expenditures categories, such as instruction, research, public service, academic support, institutional support and student affair /services have been compared against a variety of student outcomes. Some of the outcomes mentioned in the literature include admission test scores, future earnings, college student retention, student persistence and graduation, leadership development, student engagement, quality of student effort, and knowledge gain. Relating institutional expenditures to student outcomes have produced inconclusive and sometimes contradictory results. Of the student outcomes measured, the literature reflects student engagement and college student retention indicators to be the most contradictory both between and within studies when compared to institutional expenditures (Astin, 1993; Ryan, 2004; Ryan, 2005; Gansemer-Topf & Schuh, 2006; Pike, et al., 2006).

Student Engagement and Expenditures

Using partial, self-reported scores from the National Student Engagement Survey (NSSE) at 142 colleges and universities, Ryan (2005) failed to associate student engagement with expenditures in any expenditure categories, save for a negative relationship to institutional support. In a follow-up study, Pike et al. (2006) used all NSSE student engagement indicators at 299, mostly public institutions. They found when controlling for institutional governance, year in school, and type of student engagement, aspects of engagement were positively linked to expenditures for instruction, public service, academic support, student affair /services, and institutional support. The same study found expenditures for research produced both positive and negative relationships to student engagement. Some of the discrepancies between the

results of the above-mentioned studies can be explained by differences in methodologies and data sets. Characteristics of contradicting studies on college student retention, however, are more homogeneous.

College Student Retention and Expenditures

Contradictory results between college student retention and expenditures have been discussed in the literature. In his landmark work, Astin (1993) found a positive relationship between expenditures for student affairs / services and retention, specifically at private colleges. A decade later, Ryan (2004) gathered information from the Integrated Postsecondary Data System (IPEDS) on 363 baccalaureate institutions. He positively linked college student retention to expenditures for instruction and academic support, but found no significant relationship to money spent on student affairs / services. Focusing solely on private institutions from the same data source, Gansemer-Topf and Schuh (2006) supported Ryan's link to academic support expenditures, but negatively related college student retention to student affairs / services and institutional support expenditures.

Institutional Expenditures for Student Affairs / Services

Stewart (2007) concluded that chief student affairs / services officers value the responsibility of serving as good fiscal stewards and work to keep student needs and institutional and divisional missions at the core of their financial decision-making. By definition, funds to support departments, salaries, programs, and initiatives in student affairs / services were reported in the student affairs / services expenditure category. Student affairs / services professionals with fiscal responsibilities would note a lack of

empirical evidence that relates institutional expenditures for student affairs / services to student outcomes. Of the studies discussed in the current literature, only three student outcomes were positively associated with the student affairs / services expenditure category: college student retention (Astin, 1993), quality of student effort (Hayek, 2001), and student engagement (Pike, et al., 2006). In other studies, however, significant relationships were not found between student affairs / services expenditures and college student retention (Ryan, 2004) or student engagement (Ryan, 2005). In fact, a negative relationship was found for college student retention in the Gansemer-Topf and Schuh (2006) study. The literature supported that the most inconclusive student outcome measures were college student retention and engagement as they relate to institutional expenditures. Within the expenditure categories discussed, the relationship between money spent for student affairs / services and college student retention produced the most uncertain outcomes.

A Need for More Research

With such inconclusive findings presented in the literature, Pike et al. (2006) concluded that a conceptual model comparing the relationship between expenditures and student outcomes is not plausible under the existing research. They suggested conducting further research where student outcome variables are examined from multiple assessment tools and compared with other data sources. Focusing on baccalaureate colleges, Ryan (2004) suggested expanding the population to investigate the relationships he found between expenditures and degree attainment. Gansemer-Topf and Schuh (2006) echoed Ryan's suggestion, adding the need for different control variables. In an attempt to

develop more advanced approaches to resource allocation, Ryan (2005) suggested concentrating the investigation to identify statistical relationships between institutional expenditures and student outcomes. These suggestions implied that intense, focused research on the relationship between specific expenditure categories and precise student outcomes would add to the current literature base and contribute to a conceptual model.

Statement of the Problem

In an age of financial accountability in higher education, inconsistencies in connecting student outcomes to expenditures for student affairs / services weaken an already fragile case for a financial justification of these expenditures. While volumes of other research support the effectiveness of student affairs / services, current quantitative comparisons of institutional expenditures for these services fail to substantiate justification for such expenditures. Further research is needed to investigate previous conflicting findings.

Purpose of the Study

The purpose of this study was to examine the relationship between institutional expenditures for student affairs / services and college student retention rates. The study controlled for non-student affairs / services expenditures, institutional control, institutional selectivity, institutional mission, and enrollment at four-year baccalaureate, master's and doctoral / research colleges and universities in the United States, as categorized by the Carnegie Foundation for the Advancement of Teaching (2001). Overarchingly, the study sought to detect the relationship between the amount of money spent on student affairs / services and students' decisions to remain at the institution. Predictions are made as to

the optimal environment in which expenditures for student affairs / services can predict college student retention. This study narrowed the scope of previous research, expanded the sample size, utilized more recent data sources, and accounted for different control variables in an attempt to add to the future construction of a conceptual model of the relationship among institutional expenditures and student outcomes.

Research Questions

The following research questions guided this study:

- Research Question 1: Can institutional expenditures for student affairs / services predict college student retention rates?
- Research Question 2: Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?
 - Secondary Research Question 2: Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures?

Definitions

To avoid confusion, this study provides operational definitions and descriptions to distinguish between key concepts addressed in the study. The following definitions were used:

- *Academic Support Expenditures* – “Expenditures for the support of academic 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” (Broyles, 1995, p 24).

- *Baccalaureate Colleges* - Primarily focused on undergraduate education and baccalaureate programs, these institutions awarded at least half of their baccalaureate degrees in liberal arts fields (Carnegie Foundation for the Advancement of Teaching, 2001). While the Carnegie Foundation classifies baccalaureate colleges as general or liberal arts, for the purpose of this study, they were combined into one variable.
- *Doctoral / Research Universities* – Focused on both baccalaureate and graduate education, these institutions typically offer a wide range of baccalaureate programs. They also have a heavy commitment to graduate education through the doctorate degree. “During the period studied, they awarded at least 10 doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall” (Carnegie Foundation for the Advancement of Teaching, 2001, p. 1). While the Carnegie Foundation classifies doctoral / research university as extensive or intensive, for the purpose of this study, they were combined into one variable.
- *Institutional Control* - A classification of whether an institution derives a significant portion of its funding from public sources (**public control**) or by privately elected or appointed officials and derives a significant portion of its

funding from private sources (**private, not-for-profit control**) (National Center for Educational Statistics, 2009c).

- *Institutional Support Expenditures* – “Expenditures for the day-to-day operational support of the institution. Includes expenditures for general administrative services, executive direction and planning, legal and fiscal operations, and public relations and development. Excludes expenditures for physical plant operations” (Broyles, 1995. p. 60).
- *Institutional Mission* – “A statement that captures the essence and distinctive character of the organization. It is a declaration of what an institution strives to accomplish and for whom” (Hirt, 2009, p. 19). For the purposes of this study, institutional mission was operationalized as the institution’s 2000 Carnegie classification.
- *Institutional Selectivity* – The degree to which entrance into the institution is competitive (Gansemer-Topf & Schuh, 2006). For the purposes of this study, several IPEDS data points were gathered from the institutions to create a selectivity variable. Institutions were classified as very selective, moderately selective, or minimally selective (Cunningham, 2005) (See Appendix C).
- *Institutional Size* – An indicator based on the institution's total students enrolled for credit for the time period specified (National Center for Educational Statistics, 2009c). Institutions with enrollments above 20,000 students were categorized as very large. Institutions with enrollment between 10,000 and 19,999 were considered as large. Institutions with enrollments

between 5,000 and 9,999 were labeled medium. Institutions with enrollment between 1,000 and 4,999 were termed small, and institutions with enrollments of 1,000 and below were considered very small.

- *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 noncredit activities. 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. Excludes expenditures for academic administration where the primary function is administration (e.g., academic deans)” (Broyles, 1995, p. 60-61).
- *Master’s Colleges and Universities* – Focused on a wide range of baccalaureate programs, these institutions also offer graduate education through the master’s degree. During the period studied, they awarded 20 or more master’s degrees per year (Carnegie Foundation for the Advancement of Teaching, 2001). While the Carnegie Foundation classifies master’s colleges and universities as I or II, for the purpose of this study, they were combined into one variable.
- *Non-Student Affairs / Services Expenditures* – All other institutional expenditures at public and private, not-for-profit institutions not reported in

the student affairs / services expenditure category as reported to the Integrated Postsecondary Data System (e.g. expenditures for instruction, institutional support, academic support, public service, and research) (NCES, 2009c) (See Appendix C).

- *Public Service Expenditures* – “Funds budgeted specifically for public service and expended for activities established primarily to provide non-instructional services beneficial to groups external to the institution. Examples are seminars and projects provided to particular sectors of the community and expenditures for community services and cooperative extension services” (Broyles, 1995, p.83).
- *Research Expenditures* – “Funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. Does not include non-research expenditures (e.g., training)” (Broyles, 1995, p. 85).
- *College student retention Rate* – “A measure of the rate at which students persist in their educational program at an institution, expressed as a percentage. For four-year institutions , this is the percentage of first-time bachelors (or equivalent) degree-seeking undergraduates from the previous fall who are again enrolled in the current fall” (NCES, 2009c, Retention section, ¶ 1).

- *Student Engagement* – “How an institution deploys its resources and organizes the curriculum, other learning opportunities, and support services to induce students to participate in activities that lead to the experiences and outcomes that constitute student success” (persistence, satisfaction, learning, and graduation) (Kuh, 2005, p. 87).
- *Student Outcomes* – General term to include student characteristics after exposure to the college environment. Includes college student retention, persistence, graduation, personal and leadership development, student engagement, knowledge gain, communication skills, etc. (Astin, 1993).
- *Student Affairs / Services Expenditures* – “Funds expended for...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 at public and private, not-for-profit institutions” (Broyles, 1995, p. 94). Examples are admissions programs, career services, counseling services, financial aid administration, student health services, campus activities, student conduct programs, etc. (except when operated as a self-supporting auxiliary enterprise).

Assumptions and Delimitations

Certain assumptions were made in order to conduct this study. Delimitations to the generalizability of the results must also be acknowledged.

Assumptions

Data were taken from the IPEDS data set. It was assumed that correct data have been reliably reported to the data set and retention rates were accurately calculated. The U.S. Department of Education and the National Center for Educational Statistics maintain the data system. Reporting data to IPEDS is mandatory for institutions participating in or applying for participation in any federal financial assistance program authorized by Title IV of the Higher Education Act of 1965 (NCES, 2009a). Due to the mandate, the researcher considered the data set to be highly accurate and reliable.

Delimitations

The researcher acknowledges there are delimitations to the scope of this study. First, while the IPEDS defines what constitutes expenditures for student affairs / services, variation in interpretation and institutional organization and characteristics could account for variability in what is reported in this category. The researcher acknowledged this as an internal threat to the validity of the study. The study attempted to address this variability by controlling for institutional mission, as defined by Carnegie classification. This was done under the rationale that similarly classified institutions would have similar organizations and, thus, similar expenses.

Second, student affairs / services expenditures are reported to IPEDS as a composite figure, representing funds spent to finance both undergraduate and graduate programs. Due to the reporting structure of IPEDS, the study was unable to extract expenditures specifically for student affairs / services for undergraduate students. Composite expenditures were compared against retention data for undergraduate students

only in this study. This discrepancy would account for variation in the internal validity of the results of the study.

Third, as noted by Gansemer-Topf (2004), financial resources are not the only thing that can affect an institution's ability to retain its students. Physical environment (Strange & Banning, 2001), student characteristics (Astin, 1993; Tinto, 1993; Webber & Ehrenberg, 2009), and institutional characteristics (Webber & Ehrenberg, 2009) have been shown to affect college student retention as well. Differences in physical environment and student population characteristics were acknowledged as extraneous variables and were not taken into consideration for this study.

Finally, the study operationalized institutional mission as the institutions' 2000 Carnegie Classification. The 2000 classification was used for this study since the IPEDS data set continues to use this classification. The Carnegie Foundation reworked the classification system in 2005, creating more detailed categories to account for within-group differences. By using the 2000 classification in this study, the researcher acknowledged that the classification system does not account for institutional within-group differences. As a result, inferences made on this variable may not truly reflect the mission of the institutions.

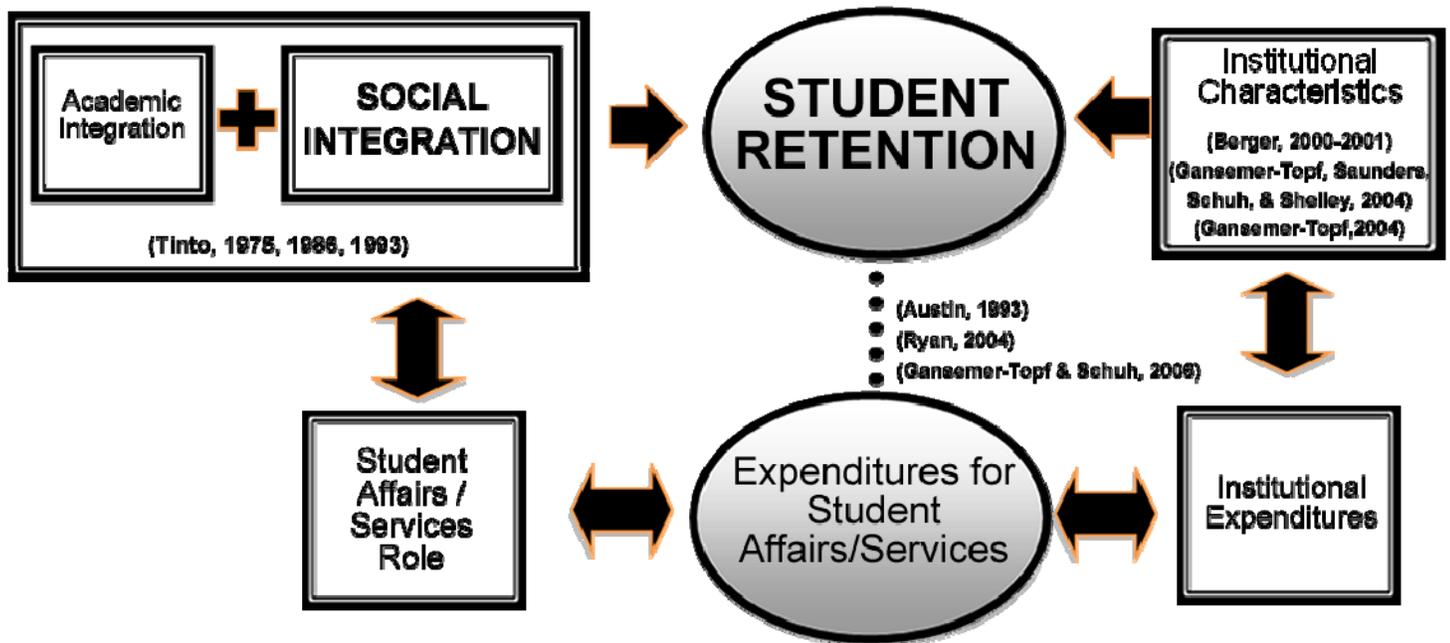
Composite Conceptual Framework

Conceptually, this study combined the theoretical framework of Tinto (1975, 1986, 1993) with the work of Berger (2000-2001) to answer the research questions. Tinto's Theory on Student Departure asserts that students are retained in higher education because they are sufficiently integrated academically and socially into the institutional

environment. This study holds that the social integration piece of the college student retention equation is, by definition, the responsibility of a division of student affairs / services (Miller & Winston, 1991; Tinto, 1975, 1986, 1993). Therefore, an investigation into the relationship between resources provided to the student affairs / services division and college student retention is warranted.

Berger (2000-2001) suggested institutional characteristics can have an effect on college student retention. This study held that institutional expenditures are behavioral characteristics of the institution; therefore, how an institution spends its resources can have an effect on college student retention (Gansemer-Topf, 2004; Gansemer-Topf, Saunders, Schuh, & Shelley, 2004). One of the proposed outcomes of this study was to predict under what combination of institutional characteristics can college student retention be optimized. The study also sought to explore contradictory results of previous research studies (Astin, 1993; Ryan 2004; Gansemer-Topf & Schuh, 2006) by expanding the sample size, utilizing more recent data sources, and accounting for different control variables. A concept map has been created to assist the reader in understanding the theoretical framework for the study (see Figure 1).

Figure 1.1. Conceptual Framework for An Analysis of Expenditures on Student Affairs / Services and College student retention at Four-Year Colleges and Universities in the United States



It is important to understand that the purpose of this study was not to test the validity of this conceptual framework. The framework served as a concept map to guide the researcher in his investigation and to assist the reader in clearly understanding the relationship between the concepts presented.

Summary

The purpose of this chapter was to begin a discussion of the relationship between institutional expenditures for student affairs / services and college student retention rates. This chapter also presented the conceptual framework for this study. Chapter Two frames the discussion by reviewing historical and contemporary literature on college student retention and finances in higher education. Chapter Three provides the reader

with an explanation of the methodology used to answer the research questions presented. Chapter Four presents, in detail, the findings of the study, while Chapter Five reintegrates the literature to draw conclusions about the findings. This chapter will also provide recommendations for future study and practice.

With an increased call for accountability in higher education, administrators seek ways to justify expenditures. Measuring expenditures against student outcomes is one way scholars have attempted to connect student outcomes to institutional expenditures. Focusing on retention as a student outcome, this study expanded on contradictory research in the literature and sought to add a more precise understanding of the relationship expenditures for student affairs / services have on college student retention. The results of this study not only answer the call for further research by other scholars (Ryan, 2004; Ryan, 2005; Gansemer-Topf & Schuh, 2006; Pike, et al, 2006), but will seek to assist decision makers in making wise, data-driven decisions about resource allocations with college student retention in mind.

CHAPTER TWO

REVIEW OF LITERATURE

Introduction

Student retention is one of the most discussed phenomena in higher education. Volumes of empirical research and academic strategies have been focused on answering the question, why do students leave the higher educational environment? Another frequently explored issue is the financial difficulties facing higher education. Combining a lack of financial support from states with an increase in accountability, higher education administrators are facing unprecedented questions about financial accountability from state legislators and the public. In efforts to answer these questions, institutions are turning to measurable outcomes, such as student retention rates, to support the idea that an investment in higher education is valid. Examining student retention through the lens of institutional expenditures, specifically for student affairs / services, this study explored the relationship between expenditures for student affairs / services and student retention under a variety of conditions. Before this can be accomplished, however, an exploration of the current state of these issues is warranted.

The purpose of this chapter is to review current and historical literature on the topics of retention, finance of higher education, and measures of accountability. In order to fully understand the context in which this study operated, the following sections will discuss literature on: college student retention, student affairs / services, accountability in higher education, and the relationship between institutional expenditures (i.e. instruction, research, student affairs / services, etc) and student outcomes (i.e. student retention,

student engagement, etc.). The theoretical framework from which the study will operate will also be discussed.

College Student Retention

Student retention has been a popular topic of academic writing since the 1960s. The quest to understand student retention has been the focus of numerous empirical research studies, scholarly publications, and theoretical models (Tinto, 2006). The need for institutions to retain their students from year to year has become vital to the financial health of the institution in light of current economic constraints (Brunsdon, Davies, Shevlin, & Bracken, 2000; Bylaska, 2008; Lee, Michelson, Olson, Odes, & Locke, 2009; Tinto, 2006). The purpose of this section is to review institutional attributes that affect student retention and discuss theoretical frameworks that help to explain student retention from both the individual and institutional perspective.

Historical Perspective on the Study of Student Retention

When student retention first became a focus of academic writing in the 1960s, researchers suggested that the personal attributes of students were the reason they did not remain in college. College dropouts, as they had been previously called, were thought to be impatient, less capable, and less motivated than students who remained in college (Tinto, 2006). This paradigm shifted in the 1970s with Spady's (1971) and Tinto's (1975) research on the impact of environmental factors, specifically institutional characteristics, on a student's decision to leave higher education.

Approaching student retention through a sociological lens, Spady (1971) developed a model based on the assumption that personal attributes of the student, when

combined with congruent environmental norms of the institution, yielded a greater chance that the student would persist at the institution. Tinto (1975) built on this model to produce one of the most cited theories on student departure (Berger & Braxton, 1998). At its core, Tinto proposed that student commitment to degree completion, coupled with individual characteristics, and the institution had significant effects on students' decisions to persist. Pascarella and Terenzini contributed to this model by developing measures to assist in the assessment of the model's core constructs, allowing student retention to be studied systematically by others (Berger & Lyon, 2005).

Concurrently, Astin (1977, 1985), using national data to study the relationship between campus involvement and students' decisions to depart from the university, found that the more involved students were in college life, both academically and socially, the more likely they would complete their degrees. The simplicity of this model was attractive to campus administrators. Astin's model served as a theoretical foundation for many campus programs and initiatives focused on the retention of college students. By the end of the 1970s, the work of Spady, Tinto, and Astin had been substantiated, and theoretical conversations on student retention gave way to practical application (Berger & Lyon, 2005).

As the enrollment boom of the 1970's peaked, campus leaders began to explore marketing and recruitment strategies to attract students to their campuses. Once on campus, administrators began applying newly discovered research on retention to encourage students to stay (Berger & Lyon, 2005). These recruitment and retention efforts resulted in the concept of enrollment management, defined by Hossler (1988) as

an “organizational concept as well as a systematic set of activities to enable educational institutions to exert more influence over their student enrollments” (p. 42). Institutions across the country began implementing enrollment management practices to varying extents and with wide results. Many institutions reorganized administrative departments, created new positions, or revisited departmental missions to reflect an enrollment management model (Berger & Lyon, 2005).

The 1980s and 1990s saw researchers expand Tinto’s (1975) model, approaching it from psychological, environmental, organizational and economic perspectives, and concentrating on populations other than traditional undergraduates. The investigation of such factors as economic influences (Cabrera, Nora, & Castaneda, 1993; St. John, Paulson, & Starkey, 1996), student learning (Tinto, 2000), and cultural influences (Rendon, 1994) on student retention prompted the creation of new retention models. The influx of data on the topic led to institutions exploring and sharing best practices, the advent of student retention advisors and consulting firms, and the creation of an academic journal devoted to the study of college student retention (Berger & Lyon, 2005; Tinto, 2006). Student retention had become an important and popular topic of conversation in higher education.

By the end of the twentieth century, student retention had become a well-established professional area of study, influencing policy and practice. As lawmakers called for accountability and transparency in higher education, institutional leaders turned to quantitative measures like student retention to demonstrate efficiency (Burke & Miassians, 2003; McLendon, Hearn, & Deaton, 2006; National Commission on

Accountability in Higher Education, 2005). The establishment of performance based funding models for state resource allocations used student retention rates as a major factor in the decision making process (Burke & Minassians, 2003; McLendon, Hearn, & Deaton, 2006). Additionally, popular college ranking systems, such as the *U.S. News and World Report's* ranking of *America's Best Colleges*, utilized student retention rates in calculating rank scores of the higher education the institutions (Laden, Milem, and Crowson, 2000; Undergraduate Ranking Criteria & Weights, 2008). An increase in an institution's rank position in the high-profile ranking systems brought attention and prestige to the institution, and student retention played a vital role in the calculations (Berger & Lyon, 2005).

Although much research has been conducted on the phenomena of student departure from college, a definitive answer to how an institution retains its students has yet to be reached. While the study of retention has gone through numerous iterations, the foundational works of Tinto (1975, 1987, 1993) have served as the theoretical framework for other adaptations of theories on student retention. Tinto's work is commonly cited as the most conclusive description of the phenomena (Berger & Braxton, 1998). Due to the fundamental importance of Tinto's work to the field, the next section provides a brief overview of the theory.

Tinto's Theory on Student Departure

Tinto's (1975, 1987, 1993) work on student departure forms the theoretical basis for numerous research studies conducted on student retention (Berger & Braxton, 1998). Based on Emile Durkheim's study of suicide, Tinto (1975) asserted students consider

leaving higher education because they have been insufficiently integrated, both academically and socially, into college life. This integration takes place longitudinally through formal and informal interactions with the institution. This lack of meaning-making leads to lower levels of student commitment to the institution and increases the probability that the student will depart from the college setting. According to Tinto (1975, 1987, 1993), the degree to which college students integrate into the academic and social environment on campuses directly affects their decision to persist in their educational pursuits.

Tinto (1975) acknowledged that predetermined, personal characteristics students bring with them to college affect their decisions to depart the college setting. Factors such as family background, skills and abilities, and pre-college educational experiences influence a student's commitment to the institution and graduation. The degree to which a student feels committed to these factors influences the level of integration into academic and social life.

Tinto's (1975, 1987, 1993) model rests on the student's ability to integrate both academically and socially into the college environment. Academic integration considers the mastery of two dimensions, structural and normative. The structural dimension of academic integration is the student's ability to meet the expectations of the university, such as academic performance and class attendance. The normative dimension is the student's ability to identify with the beliefs, norms, and values of the institution. Social integration pertains to the student's ability to establish social connections with members of the institution. These connections may take place formally, through student

organizations and student/faculty interactions, or informally in friendships and casual conversations. Satisfactory social and academic integration have a direct influence on the student's levels of commitment to graduation and to the institution. When combined with the student's initial commitment to these factors, Tinto's model predicts an increase in the likelihood the student will remain at the institution.

Building on Tinto's model, Berger (1997, 2000-2001) focused on an organizational behavior dimension, using this dimension as a lens through which to view student departure. Berger defines organizational behavior as the actions of the members of the organization, specifically students, administrators, faculty, and staff. Viewing the higher education institution as an organization, Berger (1997) asserts patterns of institutional behavior, specifically how colleges and universities allocate resources, can have important consequences for the retention of college students (Gansemmer-Topf, Saunders, Schuh, & Shelley, 2004).

Tinto's (1975, 1987, 1993) model of student departure and Berger's work on student retention and organizational behavior served as the theoretical framework for this study. Concentrating on the social integration piece of Tinto's theory, this study examined the role student affairs / services expenditures plays in retaining students. To fully understand this connection, an in-depth investigation of the social integration portion of Tinto's theory is warranted.

A Closer Look at Social Integration

In his original work, Tinto (1975) noted that the college environment is composed of both academic and social systems, each occurring formally and informally. Academic

systems are comprised mostly of formal education practices of an institution such as in-class learning. Social systems are comprised of experiences that take place largely outside of the prescribed boundaries of the classroom. Focusing on the social and intellectual needs of the student, the social system attends to “the daily life and personal needs of the various [student] members of the institution” (Tinto, 1975, p. 106). In terms of the social system’s effect on student retention, the degree to which social experiences shape departure decisions can take place informally or formally.

Informal social experience may take place at any time in any venue on campus. These exchanges quite often happen in the residence hall, at sporting events, in the cafeteria, on the campus grounds, or in the hallways between classes. The formal social system includes participation in campus-organized clubs or organizations (i.e. student government associations, special interest groups, Greek organizations, and etc.), institutional-organized programs and experiences (orientation programs, intramural sports, leadership training, etc.), and religious organizations (Tinto, 1975, 1987, 1993). While informal social interactions happen almost spontaneously, formal social experiences must be created, supervised, managed, and assessed by institutional staff members.

In terms of the organizational structure of the institution, staff members creating these formal social experiences are typically housed in a division of the university charged with managing the out-of-class experiences and services students require (Dungy, 2003). The institutional organization, classification, and arrangement of these responsibilities vary considerably from campus to campus; however, the term “division

of student affairs / services” is an agreed upon name used to describe the administrative units that are charged with these tasks (Miller & Winston, 1991, p.xvi). The following section examines the role a division of student affairs / services plays in the social integration components of Tinto’s (1975, 1987, 1993) theory of student departure.

Role of Student Affairs / Services in Social Integration

Miller and Winston (1991) defined student affairs / services as “the organizational structure or unit on a campus responsible for the out-of-class education, and in some cases in-class education as well, of students” (p. xv). The field of student affairs / service has grown in scope and mission from the origins of higher education in the United States in the mid-seventeenth century (Nuss, 2003). Philosophically, the profession originated with the publication of the *Student Personnel Point of View (SPPV)* (American Council on Higher Education, 1937). The SPPV charged universities with the task of “consider[ing] the student as a whole – his intellectual capacity and achievement, his emotional make up, his physical condition, his social relationships, his vocational aptitudes and skills, his moral and religious values, his economic resources, and his aesthetic appreciations” (p. 39). In an effort to support the mission of the institution, the document suggested institutions develop administrative services to help achieve these goals.

Components of the student affairs / services division vary across institutions, with Dungey (2003) classifying functional units as traditional or emerging. Traditional functional areas of student affairs / services are those that are uniformly found at institutions, for example admissions, records, financial aid, student activities, and

counseling. Emerging functional areas are those that “are being adopted by more institutions each year but not yet by the majority of schools” (p. 342), including assessment and program evaluation, commuter services, service learning programs, international student services, and women’s centers. Dungy lists other common functional areas of student affairs / services, such as, residence life and housing, orientation and new student programs, multicultural student services, Greek affairs, health services, and judicial affairs.

No matter the components of the division of student affairs / services, Hamrick, Evans, and Schuh (2002) asserted that the mission of the division should be to foster student learning from a holistic approach. By definition, the responsibility for the creation of out-of-class, formal, and informal social and educational experiences organizationally lies within the student affairs / services division (Miller & Winston, 1991). While it is widely acknowledged that student retention is the responsibility of the entire campus (Bean, 2005; Seidman, 2005; Tinto, 1975, 1987, 1993), units within the division of student affairs / services are mission-bound to provide opportunities to foster social integration outside the classroom (Kuh, Schuh, & Whitt, 1991). Tinto’s theory on student departure (1975, 1987, 1993) stresses the importance of these interactions as an integral piece in students’ decisions to persist in higher education. The more integrated a student becomes in social and academic aspects of the institution, the more likely they are to persist in their education. Therefore, it can be argued that the educational and social opportunities units within a student affairs / services division play a vital role in a student’s decision to persist or leave the institution. If an institution’s goal is to build

student retention programs, providing resources to the division of student affairs / service to create opportunities for social integration is an important part of a retention strategy.

Institutional Effects on Retention

Several researchers have explored the effects institutional characteristics have on student retention. Bean (1983) and Braxton and Brier (1989) found that student satisfaction and involvement, which Tinto (1993) related to retention, were impacted by organizational attributes of the institution. Berger and Braxton's (1998) study found that organizational characteristics had a direct effect on student satisfaction and an indirect effect on a student's intent to persist. Tinto (1993) acknowledged the importance of studying the effects of the organization on student retention, a position Braxton, Sullivan and Johnson (1997) support. Braxton, *et al.* further suggests that the relationship between student retention and fiscal and environmental aspects of the institution constitute further exploration.

Berger (1997) explored the direct relationship presented by Braxton, *et al.* (1997). Berger's study confirmed that colleges and universities are organizations, and organizational behavior is an appropriate lens through which to view student departure. Berger defined organizational behavior as the actions of the members of the organizations (i.e. students, administrators, faculty, and staff). Berger asserted patterns of institutional behavior could have important consequences for the retention of college students. At the conclusion of his 2002 study, Braxton acknowledged that the direct examination of student retention and graduation rates as a function of organizational behavior provided significant contributions to the study of college student retention.

For the purpose of the current study, colleges and universities were “perceived as organizations that can exhibit patterns of behavior (specifically by how they allocate resources)” (Gansemer-Topf, 2004, p. 49). The current study viewed the allocation and expenditures of resources for the division of student affairs / services as an organizational behavior. The effects of this behavior on student retention was the purpose of the inquiry. This notion has been the conceptual basis of similar studies (see Gansemer-Topf, 2004; Gansemer-Topf, Saunders, Schuh, & Shelley, 2004; Gansemer-Topf & Schuh, 2006)

Summary

The study of student retention has grown in scope and depth since its emergence in the academic literature of the 1960s. Tinto’s (1975, 1987, 1993) theory on student departure has become the foremost empirical explanation of why students leave higher education and has been used as the theoretical basis for countless studies on the topic (Tinto, 2006). The social integration aspect of the theory focuses on formal and informal opportunities for social interaction on a college campus. Administratively, the responsibility to foster these opportunities lies within the division of student affairs / services. Berger (2000-2001) argued that the way institutions behave (i.e. resource allocation) could also affect student retention. While student retention efforts are the entire campus’ responsibility, the division of student affairs / services is mission-bound to create opportunities for social integration, both formally and informally. To do so, adequate funding for these programs must be in place. Funding in higher education, however, is a complex problem in and of itself. The following section takes a close look

at funding higher education. The section discusses literature on finance in higher education; accountability, effectiveness, and efficiency in higher education; and institutional expenditures and student outcomes.

The Financing of Higher Education in the United States (US)

Accountability, Productivity, and Efficiency in Higher Education

From the beginning of higher education in the US during the 1600s, institutions struggled financially. Early private colleges, such as Harvard, William and Mary, and Yale, operated solely from tuition revenue (Thelin, 2004). After the Revolutionary War, issuing charters for state universities became a popular method for legislators to repay political debts. Since financial support for institutions was not guaranteed, institutions were forced to rely on fundraising. Today, however, higher education represents a significant public investment, with the United States spending \$330 billion in 2005 (Webber & Ehrenberg, 2009). Because of this investment of state tax dollars, combined with economic downturns, citizens are calling for institutions to be held accountable for the funding they receive (McLendon, Hearn, & Deaton, 2006; McGuinness, 2005).

Accountability, according to Trow (1998), is “the relations of colleges and universities to the people, groups, and institutions in the society that support them” (p. 15). Being accountable, therefore, involves explaining or justifying the actions of the university and its representatives with the goal of meeting institutional goals with as few resources as possible (Gansemer-Topf, 2004). This concept was relatively foreign to public institutions until the mid-twentieth century. Historically, higher education was viewed as an ivory-towered entity requiring considerable funding from the state to

operate. State lawmakers required little justification or evidence of productivity or outcomes (Schmidtlein & Berdahl, 2005). The landscape changed during political unrest of the 1960s when public trust in higher education waned as institutions raised tuition and increased allocation requests while at the same time increasing selectivity and graduating “underprepared students” (Kerr, 2001, p. 167).

By the end of the 1980s, state legislators called for institutions to produce metrics assessing institutional outputs in order to secure funding (McGuinness, 2005). Under these accountability measures, an institution’s funding was tied to performance in such areas as student retention rates, graduation rates, undergraduate access, student scores on licensure exams, job placement, and campus diversity (McLendon, Hearn, & Deaton, 2006). This approach to tying state funding to student outcomes resulted in the implementation of three types of budgeting strategies: performance funding, performance budgeting, and performance reporting (Burke & Minassians, 2003).

Performance funding “directly and tightly” linked state funding to the performance of public campuses on specified indicators (Burke & Minassians, 2003, p. 3). This type of budgeting requires institutions to meet predetermined markers in order to receive a designated amount of funding. Additional funding could be obtained for good or improved performance at the discretion of the allocating officials. By 2003, 25 states had adopted this type of funding schema. In comparison, performance budgeting allowed officials more flexibility and discretion in dispersing funds based on performance indicators, using them as only one factor in determining allocations for public

institutions. By 2003, 35 states had adopted performance budgeting (Burke & Minassians, 2003).

A third approach to accountability, performance reporting, has no link to resource allocations. Rather, reports of institution performance on key indicators, such as retention and graduation rates, are collected and made public to legislators, governing bodies, peer institutions, students and parents. This type of accountability measure relied on “...publicity rather than funding or budgeting to encourage colleges and universities to improve their performance” (Burke & Minassians, 2003, p. 3). By 2003, 42 states had reported utilizing performance reports as methods of accountability indicators.

The wide acceptance of these accountability measures and their ties to funding initiated public conversations about institutional productivity and efficiency (Massey, 1999; McLendon, Hearn, & Deaton, 2006). Productivity, according to Schapiro (1996), is the “ratio of output per unit of input in an organization” (p. 27). Although Massey (1999) asserted that the multifaceted productivity of higher education could be simplified to the ratio of total benefits to total costs, Gansemer-Topf (2004) maintained that productivity in higher education is so complicated it is difficult to measure. Institutional inputs (i.e. funding, student ability, faculty talent) are varied and complex, and outputs (i.e. student learning, student engagement, faculty productivity) are obscure and difficult to measure. Producing a metric of productivity is problematic, especially one as straight forward as a formula (Massey, 1999; Johnstone, 2001a; Johnstone, 2001b; Hubbell, 2007).

Hubbell (2007) defined efficiency as “the successful transformation of strategic thinking into action” (p. 6). Efficiency is achieved when agreed upon outcomes are attained at a satisfactory level of quality for the lowest expenditure of resources. As with the debate over measuring productivity, the issue in assessing efficiency lay in the inability to agree on measurable outcomes of higher education (Johnston, 2001a; Johnstone, 2001b). Based on Hubbell’s definition of efficiency, tying outcomes to a resource (dollar) amount would be futile, suggesting more measurable metrics must be used to assess efficiency.

Conversations on accountability increased with the signing of the No Child Left Behind Act of 2002 (NCLBA), which mandated strict federal guidelines for primary and secondary education (Carey, 2007). Although the NCLBA did not address higher education directly, the legislation sent a warning to higher education that federal intervention was forthcoming. Federal attention shifted to higher education with the appointment of a task force to explore access, affordability, quality, and accountability in US colleges and universities. The resulting report echoed what higher education scholars and critics had called for: greater transparency and more accountability in higher education (National Commission on the Future of Higher Education, 2006).

Johnstone (2001a) proposed efficiency and productivity of the higher education enterprise as one of three broad issues of higher education finance. He argued that measuring productivity and efficiency as a function of higher education expenditures and college student outcomes is difficult due to lack of professional consensus as to what the exact outcome of higher education should be. Student learning, Johnstone held, is the

obvious outcome of higher education, but defining and measuring the concept is complicated. In the absence of defined student outcomes and in response to the call for financial accountability, institutions turned to a variety of well defined measures to relate higher education expenditures to college student outcomes.

Expenditures and Student Outcomes

Foundational studies relating higher education expenditures to college student outcomes first appeared in the academic literature in 1970. Rock, Centra, and Linn (1970) investigated the characteristics of effective colleges, examining the relationship between institutional inputs and student ability. The researchers used regression analysis to compare standardized test scores with per-student expenditures at 95 small, mostly private, institutions. They found no relationship between the two variables. Also utilizing regression analysis, James, Alsalam, Conaty, and To (1989) were unable to establish a significant relationship between per student expenditures and the future earnings. James, et al. sampled 2,280 male students representing 519 colleges for their study.

More recent research comparing student outcomes across expenditure categories produced inconsistent results between and within studies. Using a sample of 106 four-year public and private institutions, Hayek (2001) utilized a student-centered approach to identify high performing colleges and universities. Using multiple regression procedures, the researcher found strong direct relationships between expenditures for student affairs / services and institutional support and high performing institutions. Controlling for other variables, however, a relationship failed to exist. In addition, Hayek found persistence

and graduation rates were positively related to expenditures for instruction, research, academic support, and institutional support. In the same study, the researcher found a strong, positive, bivariate relationship between the quality of student effort and expenditures for student affairs / services and institutional support. A weak, yet still positive, bivariate relationship between expenditures on research and public service and quality of effort was also discovered. Negative relationships between quality of student effort and expenditures for instruction and academic support were found as well. While Hayek's study was successful in justifying a new way to measure collegiate quality, he found interesting discrepancies between expenditures and student outcomes. These results led other researchers to investigate further.

In an attempt to understand the relationship between institutional characteristics and educational gains, Toutkoushian and Smart (2001) found correlations to institutional expenditures as well. The researchers measured student perceptions of educational gains (i.e. change in work/interpersonal skills, tolerance/awareness, communication skills, etc.) of 2,269 students representing 315 institutions, using the Cooperative Institutional Research Program (CIRP) survey. The students responded to this questionnaire as first-year students and then again four years later. In relation to institutional expenditures, the researchers found higher per-student expenditures were positively related to student gains in interpersonal skills and learning/knowledge acquisition. Further, when analyzed by expenditure category, Toutkoushian and Smart found students attending institutions where a large portion of expenditures are devoted to academic support reported lower gains in communication skills and knowledge acquisition. Proportions of institutional

support expenditures resulted in a positive gain in knowledge, while students indicated no impact on interpersonal development from money spent on instruction. This study provided additional empirical evidence of relationships between institutional expenditures and student outcomes.

Using the same CIRP data as Toutkoushian and Smart (2001), Smart, Ethington, Riggs, and Thompson (2002) compared student perceptions of their leadership abilities to institutional expenditure patterns. From a sample of 2,410 students representing 360 institutions, the researchers found expenditures on student affairs / services were positively related to leadership development, albeit indirectly. Negative relationships between money spent on instruction and perceptions of leadership were discovered, while expenditures for academic support were not found to be significant. The results of this study led Smart, et al. (2002) to conclude that institutional expenditures for student affairs / services are more likely to aid in student leadership development than expenditures on instruction.

Researchers have disagreed on the relationship between expenditures and student engagement. Student engagement, as defined by Kuh (2005), is a measure of the level of commitment a student exerts toward their academic, social, and other educationally purposeful pursuits. Expanding on previous research, Ryan (2005) compared self-reported composite scores from the National Survey of Student Engagement (NSSE) for 142 public and private institutions with institutional expenditures. Except for a negative relationship with institutional support expenditures, Ryan was unable to associate this measure of student engagement statistically with expenditures in any of the categories.

Pike, Smart, Kuh, and Hayek (2006) expanded the work of Ryan (2005), considering scores on individual engagement benchmarks, as measured by the NSSE, to compare engagement to expenditures. Accounting for institutional control and year in school, the researchers were able to articulate which benchmark related positively or negatively to the expenditure categories. Overall, they found student engagement in some form for either first-year students or senior students was positively linked to expenditures for instruction, public service, academic support, student affairs / services, and institutional support. The same study found expenditures for research produced both positive and negative relationships with student engagement. Discrepancies between and within these studies failed to support a strong conclusion about the relationship between student engagement and institutional expenditure categories.

Investigating the relationship between degree attainment and institutional expenditures, Ryan (2004) focused a study on 363 Carnegie-classified Baccalaureate I and II colleges. The study strongly affirmed relationships between institutional expenditures, student persistence, and degree attainment. The researcher positively linked retention and graduation rates to expenditures for instruction and academic support but found no significant relationship with money spent on student affairs / services.

In a similar study, Gansemer-Topf and Schuh (2006) focused on 466 private institutions from the same Carnegie classification. Their findings supporting Ryan's link to academic support expenditures. However, their results indicated a negative relationship between retention and expenditures in student affairs / services and institutional support. Both the Ryan (2004) study and the Gansemer-Topf and Schuh

(2006) study drew from similar populations and utilized similar data analysis procedures, yet produced contradictory results. The variation between the results of the studies is difficult to explain and begs further investigation.

Summary

With an increased call for accountability in higher education, administrators seek ways to justify expenditures. Measuring institutional expenditures against student outcomes is one way administrators have attempted to do so. In the current academic literature, few studies have empirically examined the relationship between institutional expenditures and student outcomes. While most studies showed some type of relationship between variables (Astin, 1993; Hayek, 2001, Toutkoushian & Smart, 2001; Smart, et al., 2002; Ryan, 2004; Ryan, 2005; Gansemer-Topf & Schuh, 2006; Pike, et al., 2006), a significant number did not show a relationship (Rock, Centra, & Linn, 1970; James, Alsalam, Conaty, & To, 1989; James & Alsalam, 1993; Ryan, 2004; Ryan 2005). Of studies discussed here, the most conflicting results were found in measuring expenditures for student affairs / services in relation to student retention rates. According to the study conducted by Astin (1993), a positive relationship exists between the two variables, while the Gansemer-Topf and Schuh (2006) study found a negative one. Ryan's (2004) study failed to substantiate any relationship. All three studies used, for the most part, a similar population: private, baccalaureate colleges. The difference in the results from these studies leads to the current study of exploring expenditures for student affairs / services in relation to student retention.

Summary of Literature Review

Brunsdon, Davies, Shevlin, and Bracken (2000) suggested when students depart an institution before attaining a degree, both the individual and the institution experience negative financial repercussions. In the current higher education fiscal environment, most institutions cannot afford to lose students. Recruiting and retaining students, then, is one of the primary goals for institutional leaders (Seidman, 2005). Student retention is a much discussed topic in higher education, with volumes of academic writing devoted to the subject. Although many have studied the phenomenon, no one has been successful in constructing an answer to the question, why students leave higher education. Tinto (1975, 1987, 1993) and similar theorist have focused study on the individual's role in the retention process; however, Berger (1997, 2000-2001) found that institutional behavior is a valid way from which to view student departure. The current study viewed funding for student affairs / services, as organizational behavior and explored connections between those expenditures and student retention.

Additionally, public scrutiny of higher education expenditures adds pressure to administrators to produce measurable outcomes. Of those outcomes, student retention is a common metric of accountability used to assess institutional effectiveness. The relationship between institutional expenditures and retention has been explored in the literature; however, the studies produced contradictory results. The inconclusivity of published studies provides justification for further exploration.

The purpose of this chapter was to provide a background of academic literature that supported the exploration of a relationship between institutional expenditures for

student services and college student retention. Current and historical pieces were examined, and a significant hole in the literature was defined. These foundational pieces of literature served as the basis from which this study operated.

CHAPTER THREE

METHODOLOGY

Introduction

The purpose of this chapter is to outline the methodology chosen to empirically investigate the relationship between expenditures for student affairs / services and college student retention rates. The following discussion reintroduces the research questions outlined in Chapter One. This chapter provides rationale for the research design and data analysis methods that were used in the study. Additionally, data collection and analysis procedures are discussed.

Research Questions

The purpose of this study was to examine the relationship between institutional expenditures for student affairs / services and college student retention rates. The study controlled for non-student affairs / services expenditures, institutional control, institutional selectivity, institutional mission, and institutional size at four-year baccalaureate, master's and doctoral / research colleges and universities in the United States. To that end, the following research questions guided this study:

- Research Question 1: Can institutional expenditures for student affairs / services predict college student retention rates?
- Research Question 2: Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?

- Secondary Research Question 2: Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures?

Research Design

Due to the nature of the investigation into the relationship between expenditures for student affairs / service and college student retention, the researcher chose a quantitative design for this study. The quantitative approach is well-suited for this study due to the purpose of the study, the nature of the research questions, the type of data collected, and the size of the population.

Situated from a postpositivist perspective, quantitative research seeks to explore cause and effect relationships, test theories, and make meaning of phenomena through measurements (Creswell, 2003). The use of statistical analyses yields generalizable interpretations of the data. The quantitative approach is viewed as less biased than other approaches and is subjected to a variety of standards of reliability and validity. When using this method, the researcher's role is to interpret the data to verify the theories in question, identify new variables, relate variables, or test hypotheses. Due to the nature of quantitative research, sample sizes can be large (Creswell, 2003).

Population of Study

The population considered for this study was four-year, degree granting, not-for-profit, public and private colleges and universities in the United States who reported complete data surveys to the Integrated Postsecondary Education Data System (IPEDS) for the 2007-2008 academic year. The 2007-2008 academic year was chosen because it

is the most current, complete data set available. The study only considered institutions classified by the 2000 Carnegie Classification as baccalaureate colleges – general, baccalaureate colleges – liberal arts, Masters Colleges and Universities I, or Masters Colleges and Universities II. Doctoral / research – extensive and doctoral research – intensive were also considered (see Appendix C). This study utilized the entire population in order to draw inferences about the data (N=1252). Schaeffer, Mendenhall, and Ott (2006) suggested researchers utilize a complete population data set when the data are available. For this study the researcher had access to the complete set and examined a single population at one point in time.

Methodological Conceptual Framework

In order to provide the reader with a clear picture of the methodologies utilized in this study, a methodological conceptual framework was created. To address each research question, certain data points were collected from the population. The methodological conceptual framework maps each research question to the data source from which information was drawn. This framework also provides references to supporting literature as justification for data choices (see Table 3.1).

Table 3.1. Methodological Conceptual Framework

Research Question(s):	Variable(s) Collected	IPEDS 2008 Survey Component	Survey Component Part	Survey Component Item	Supporting Literature
Research Question 1: Can institutional expenditures for student affairs / services* predict student retention rates?	Expenditures for student affairs / services – Public institutions (FY 07-08)	Finance (Public institutions)	Part C	Item #6; Col. 1	Astin, 1993; Ryan, 2004; Gansemer-Topf & Schuh, 2006
	Expenditures for student affairs / services – Private not-for-profit institutions (FY 07-08)	Finance (Private not-for-profit institutions)	Part E	Item #5; Col 1	
	Student retention rates (Fall 07 – Fall 08)	Fall Enrollment	Part E	Item #4	
Research Question 2: Can institutional expenditures for student affairs / services predict student retention rates when other important institutional variables are controlled?	Non-student affairs / services expenditures - Public institutions (FY 07-08)*	Finance (Public institutions)	Part C	Item #6; Col. 1 Item #15; Col.1	Cunningham, 2005; Pascarella & Terenzini, 1991, 2005; Upcraft, Gardner, & Barefoot (2005)
	Non-student affairs / services expenditures - Private not-for-profit institutions	Finance (Private not-for-profit institutions);	Part E	Item # 5; Col. 1 Item #13; Col. 1	

Secondary Research Question 2: Under what combination of conditions can student retention rates best be predicted by student affairs / services expenditures?	(FY 07-08)*			
	Institutional control	Institutional Characteristics;	Part B	Item #1
	Institutional selectivity*	Institutional Characteristics	Part C	Item #1, 2, 3, 4
	Institutional mission*	Institutional Characteristics	Part B	Item #2
	Institutional size	Fall Enrollment;	Part A (Fall Enrollment Totals)	Item #17

Note. * Derived variable. See Appendix C.

Data Collection

The data were obtained from the Integrated Postsecondary Education Data System (IPEDS), an on-line statistical data and information set of postsecondary institutions in the United States. The system is maintained by the U.S. Department of Education and the National Center for Educational Statistics. More than 6,700 institutions take part in the annual survey (NCES, 2009a).

Institutional data are reported to IPEDS in a series of nine interrelated, annual survey components collected over three collection periods (Fall, Winter and Spring). Survey components include: Institutional Characteristics, Completions, 12-Month Enrollment, Human Resources, Fall Enrollment, Finance, Student Financial Aid, Graduation Rates, and Graduation Rates 200% (NCES, 2009d). Appendix B provides a brief description of the surveys. Each survey component is comprised of multiple parts (Part A, Part B, etc.) with varying numbers of survey items in each part. Respondents enter data into a Web-based data collection tool in response to multiple choice or open-input survey items (NCES, 2009b).

Reporting data to IPEDS is mandatory for institutions participating in or applying for participation in any federal financial assistance program authorized by Title IV of the Higher Education Act of 1965 (NCES, 2009a). Due to the mandate, the data set is considered to be complete, accurate, and reliably reported. An expert data gatekeeper assisted the researcher in accurately collecting and interpreting data from the IPEDS database.

Data Source for Research Question One

To address research question one, “Can institutional expenditures for student affairs / services predict college student retention rates?,” data were collected from the IPEDS Finance Survey and the Fall Enrollment Survey. From the Finance Survey, institutional expenditures for student affairs / services data were collected from both public and private, not-for-profit institutions for fiscal year 2007-2008. Since public and private, not-for-profit institutions utilized different IPEDS financial reporting structures, data from each type of institution were gathered separately (NCES, 2009a). These values were summed to generate a total student affairs / services expenditures variable for use in statistical analysis (see Appendix C).

From the Fall Enrollment Survey, each institution’s student retention rate was collected. The student retention rate is the percentage of first-time bachelors degree-seeking undergraduates from Fall 2007 who again enrolled in Fall 2008. Operationally, this metric is calculated by dividing the number of students who returned for Fall 2008 by the number of students who were originally enrolled in Fall 2007. The ratio is calculated on the IPEDS Fall Enrollment Survey and reported in Part E, Item number four of the instrument (see Table 3.1). This ratio was used as the student retention variable for statistical analysis.

Data Source for Research Question Two

To address research question two, “Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?,” data were collected from the IPEDS Finance Survey,

Institutional Characteristics Survey, and the Fall Enrollment Survey. From the Finance Survey, the institution's total expenditures and expenditures for student affairs / services was collected. A variable, non-student affair / services expenditures, was generated (see Appendix C). This variable was used to control for possible correlation and shared variance between institutional expenditures for student affairs / services and institutional expenditures for non-student services.

From the IPEDS Institutional Characteristics Survey, data on institutional control, that is public or private governance, was collected. This data point is found in Part B, Item #1 of the survey. For the purpose of this study, institutional control was indicated as public or private. The variables were coded as 0 or 1, respectively, for statistical analysis.

For the institutional selectivity measure, a variable was generated by examining the number of applicants; number of students admitted; 25th and 75th percentiles of admitted students' SAT (or converted ACT to SAT) scores; and institutional policy on test score requirement for each institution in the data set. Institutions were assigned a selectivity category (very selective, moderately selective, or minimally selective) based on breaks in the distribution of the variable (Cunningham, 2005) (see Appendix C). The categorical data were dummy coded for statistical analysis as suggested by Kerlinger and Pedhazur (1973). A dummy variable is defined as "a vector in which members of a given category are assigned an arbitrary number, while others, that is, subjects not belonging to the given category, are assigned another arbitrary number" (p. 105). This coding scheme is suggested when statistical analysis must be done on variables that are categorical in nature. For the purpose of this study, the variable SelDummy1 compared minimally

selective institutions against moderately selective institutions, or less selective institutions. The variable SelDummy2 compared moderately selective institutions against very selective institutions, or more selective institutions.

Information on institutional mission, operationalized in this study as the institution's 2000 Carnegie Classification, was also collected from the IPEDS Institutional Characteristics Survey. Although the Carnegie Foundation reclassified institutions in 2005 (Carnegie Foundation for the Advancement of Teaching, 2009), the IPEDS data set continues to categorize institutions according to the 2000 standards (NCES, 2009c). This data point is collected on the Survey in Part B, Item #2 (see Table 3.1). Institutional classification types were operationally categorized as baccalaureate, masters, and doctoral / research institutions (see Appendix C). The categorical data were dummy coded for statistical analysis as suggested by Kerlinger and Pedhazur (1973). For the purpose of this study, the variable MissionDummy1 compared doctoral / research institutions against masters institutions, or graduate institutions. The variable MissionDummy2 compared baccalaureate institutions against masters institutions, or non-doctoral / research institutions.

Finally, from the IPEDS Fall Enrollment Survey, institutional size was operationalized. Institutional size is an indicator derived from the institution's total number of students enrolled for credit in Fall 2007. This data point is reported in Part A, Item #17 in the survey (see Table 3.1).

Data Source for Secondary Research Question Two

To address secondary research question two, “Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures?”, data were collected from the IPEDS Finance Survey, Institutional Characteristics Survey, and the Fall Enrollment Survey. This was the same data used to address research questions two.

Data Analysis

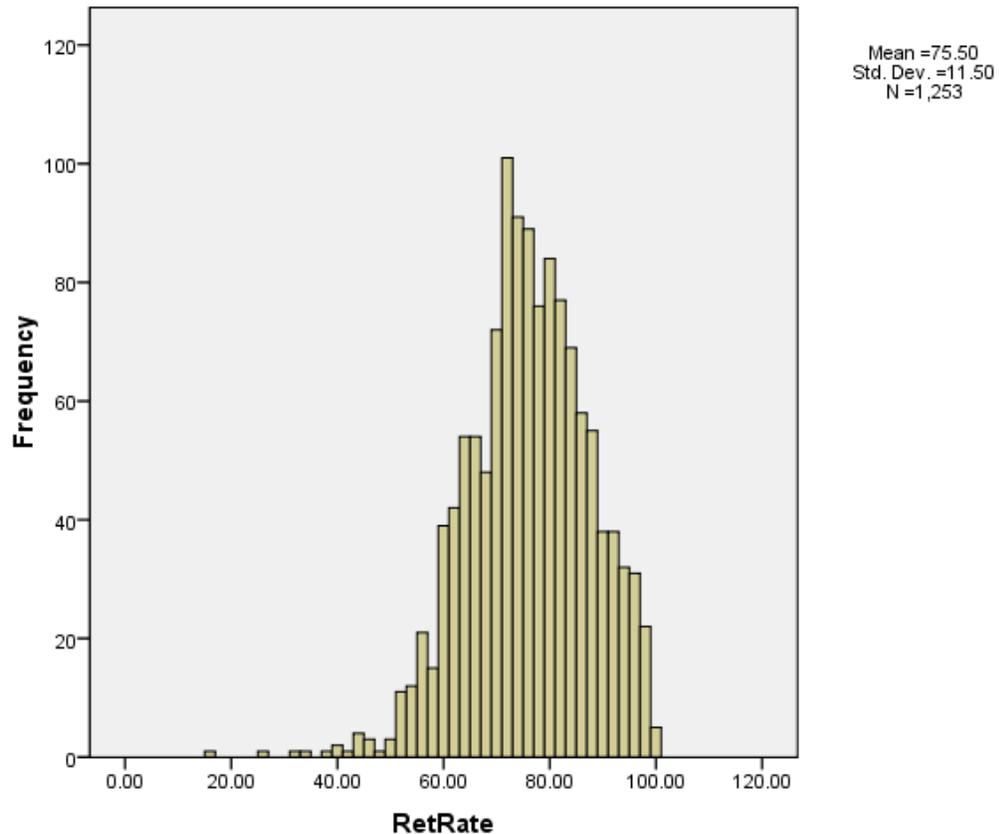
Multiple Regression Analysis

Descriptive and inferential statistics were used to analyze the data collected. The researcher used the *Statistical Package for the Social Sciences 17.0* (SPSS) to analyze the data set. Multiple linear regression, a statistical method where dependent variables are predicted using one or more independent variables, was utilized to answer the research questions presented. (Hinkle, Wiersma, & Jurs, 2003, p. 461). An alpha level of .05 was used for this study. The alpha level is the probability of making a Type I error which means rejecting the null hypothesis when it is true. This alpha level is commonly used in social science research (Hinkle, et al.).

For the multiple regression analysis to be applied correctly, data must adhere to the three assumptions of: a.) normality; b.) linearity; and c.) homoscedasticity. First, regression assumes that variables have normal distributions. Normality was assessed by visually inspecting histograms and scatter plots of the graphed data points (Osbourne & Waters, 2002). According to Osbourne & Waters, this is an easily observed and

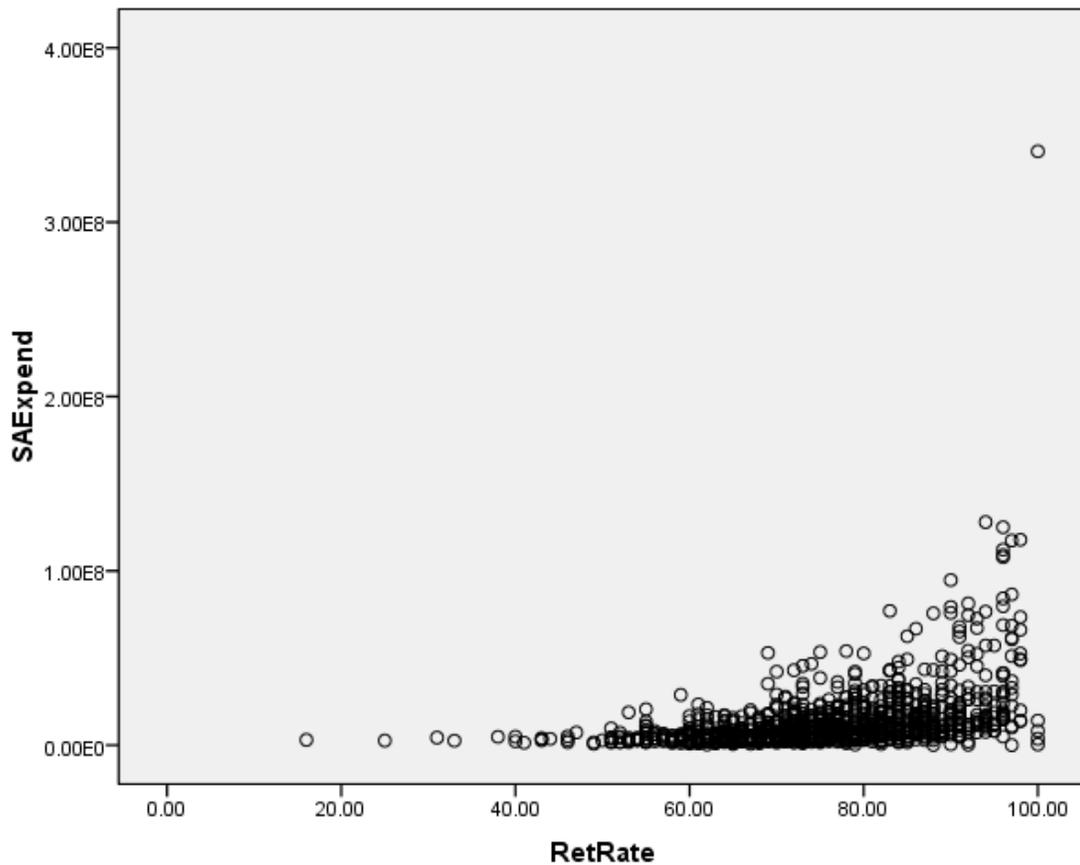
commonly practiced way to identify normality. Upon analysis, the dependent variable was determined to be normally distributed (Figure 3.1).

Figure 3.1. Histogram of Distribution of Dependent Variable to Assess Normality



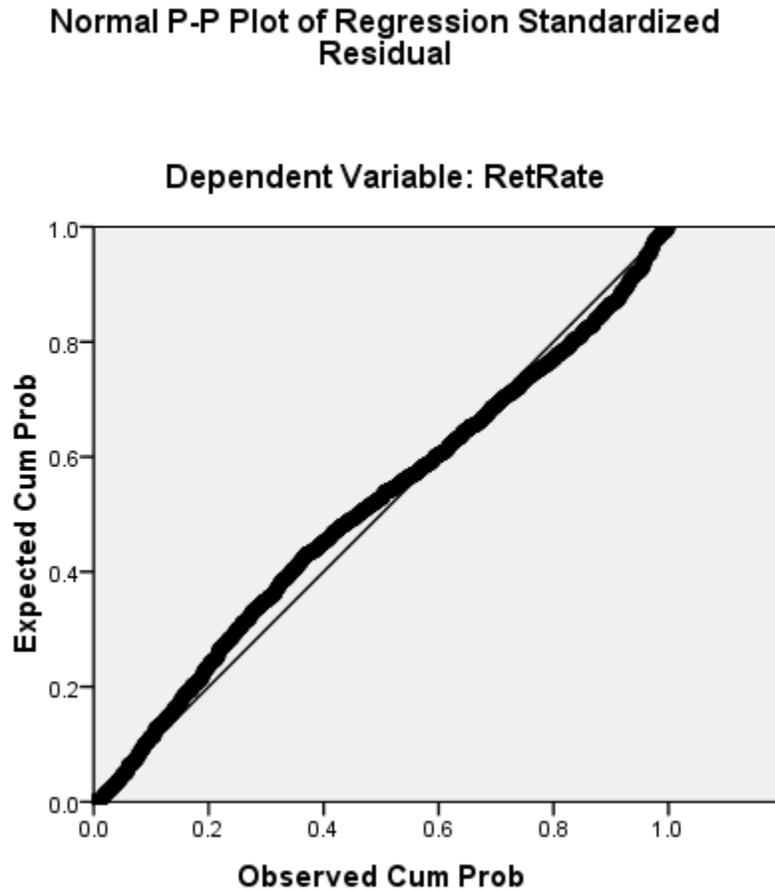
Second, linearity refers to the assumption of a linear relationship between the independent (expenditures for student services) and dependent (student retention) variables. Osbourne & Waters (2002) assert that linearity is best assessed through the “examination of residual plots of the standardized residuals as a function of standardized predicted values” (¶ 7). Upon review of the standardized residuals and standardized predicted values, the data considered for this study were determined to be linear (Figure 3.2).

Figure 3.2. Histogram of Independent versus Dependent Variable to Assess Linearity



Finally, homoscedasticity is the assumption that the standard deviations of conditional distributions are equal (Hinkle, et. al, 2003). This was checked by the construction of a histogram comparing the residuals verses college student retention rates (dependent variable) (Osbourne & Waters, 2002). Upon investigation of the constructed histogram, the data were determined to be homoscedastic (Figure 3.3).

Figure 3.3. Plot of Regression Standardized Residuals for Dependent Variable to Assess Homoscedasticity



Since the data met the prescribed assumptions, a multiple linear regression analysis was conducted to address the research questions posed. Before building the multiple regression model, Norušis (2008) suggested the researcher examine the descriptive statistics and correlation values of the data. An analysis of the descriptive statistics helped the researcher identify incomplete data records and helped in identifying irregular data points. Evaluating the *Pearson r* correlation values among the control variables was important in order to identify predictors that were strongly related (i.e.

institutional size and non-student affair / services expenditures). This aided the researcher in interpreting the results and helped to explain which predictor variables are kept for the final model (Norušis). Once these steps were accounted for, the researcher performed the analysis to build the regression model.

Hinkle, Wiersma, and Jurs (2003) suggested a four-step process to conduct a multiple regression analysis. Step one is to determine the regression model, yielding the regression coefficients and regression constant. The coefficients and constant are estimated using the ordinary least squares method. “They result in the smallest sum of squared difference between the observed and predicted values of the dependent variable” (Norušis, 2008, p. 243). The prediction equation is built from the coefficients and constant.

Steps two in the Hinkle, et al. (2003) process involves determining the multiple correlation coefficient (R or multiple R) and the proportion of shared variance (R^2). This step assists in examining how well the model predicts the observed values. Multiple R ranges from zero to one and represents the correlation coefficient between observed values from the data set and values predicted by the newly generated model. The proportion of shared variance (R^2) is “the proportion of variability in the dependent variable that is attributable to the regression equation” (Norušis, 2008, p.245).

Step three in the process involves testing the multiple R for statistical significance (Hinkle, et al., 2003). Testing the multiple R for statistical significance was done in the overall F test for the model. This F test assessed the null hypothesis that the population value for multiple R was equal to zero. The results of this test are displayed in the overall

analysis-of-variance (ANOVA) tables generated by SPSS. If the observed significance level was less than alpha of .05, the null hypothesis was rejected, allowing the researcher to conclude that there is a significant relationship between college student retention rates and a linear combination of the predictor variables.

Finally, step four in the process is determining the significance of the individual predictor variables (Hinkle, et al., 2003). This was assessed by evaluating the significance level of the coefficients generated for each predictor variable. This was done in an ANOVA test of the individual coefficients generated by SPSS. The ANOVA tests the null hypothesis that, in the population, the value of each individual coefficient is zero. If the observed significance level was less than alpha of .05 for any of the predictor variables, the null hypothesis was rejected. This allows the researcher to conclude if there was a linear relationship between college student retention rates and the individual predictor variables (non-student affairs / services expenditures, institutional control, institutional selectivity, enrollment, and institutional mission as operationally defined earlier in the chapter) when the other predictor variables in the equation were held constant (Norusis, 2008).

Several techniques are available to researchers for multiple regression model building. For the purpose of this study, the predictor variables were forced into the regression model in a pre-determined order (institutional selectivity, institutional control, enrollment, institutional mission, non-student affairs / services expenditures, and expenditures for student affairs / services). The order of input was based on previous research as to the effect of the predictor variables on student retention (Pascarella &

Terenzini, 1991, 2005; Dale & Krueger, 1999; Flowers, Osterlind, Pascarella, & Pierson, 2001; Rumberger & Thomas, 1993; Upcraft, Gardner, & Barefoot, 2005). The forced entry regression model building method is considered to be more accurate than automated model building techniques because it allows the researcher to make judgments as to which variables are entered into the equation based on their correlation to each other (Norušis, 2008). Once the predictor variables were forced into the regression model, the procedure then calculated the significance of the contribution of newly added variable (change in R^2). Once all predictor variables were in the model, the researcher determined which ones contributed significantly to the regression. The resulting model was used to assess the research questions presented (Norušis).

Data Analysis Per Research Question

Research Question One: Can institutional expenditures for student affairs / services predict college student retention rates? To address research question one, the regression analysis was conducted and the *Pearson r* correlation coefficient was examined for significance. The *Pearson r* index is an indicator of the linear relationship between the independent variable (expenditures for student affairs / services) and the dependent variable (college student retention). The index ranges in value from +1 to -1 and the resulting correlation was tested for significance against the null hypothesis that the true correlation in the population was 0 (Norušis, 2008). As mentioned in the previous section, this analysis was conducted prior to the building of the regression model.

Research Question Two: Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled? The second research question was evaluated from the regression model yielded from the regression analysis. As noted above in steps two and three of the Hinkle, et al. (2003) process, the multiple correlation coefficient (R or multiple R) and the proportion of shared variance (R^2) were determined and tested for significance. Then the change in R^2 due to the addition of the variables “expenditures for student services” was examined and tested for significance.

Secondary Research Question Two: Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures? To address the secondary research question two, the significance level for the predictor variables was tested against the alpha of .05 from the ANOVA table at each step in the analysis. When R^2 reached its maximum, the beta weights and significance levels for each of the independent variables were examined to determine the optimal prediction model.

Once the final regression model was built, the model was evaluated for violation of the regression assumptions and to ensure outlying data points did not influence the results. Norušis (2008) noted several methods for evaluating the model. Calculating and examining the residuals, that is the difference between the observed and predicted values of the dependent variable (retention rates), was utilized to assess the stability of the model.

Summary

The purpose of this chapter was to outline the methodology chosen to empirically investigate the relationship between expenditures for student affairs / services and retention rates. The chapter reintroduced the research questions, discussed the population considered for the study, and introduced the methodological conceptual framework. The data source, IPEDS, was described in detail, and procedures used to collect and analyze data gathered for the study were outlined. Justification for data collection, variable choice, and analysis procedures were also discussed.

CHAPTER FOUR

PRESENTATION OF FINDINGS

Introduction

The purpose of this study was to examine the relationship between institutional expenditures for student affairs / services and college student retention rates. The study controlled for non-student affairs / services expenditures, institutional control, institutional selectivity, institutional mission, and institutional size at four-year baccalaureate, masters, and doctoral / research colleges and universities in the United States. Data was collected from the 2008 IPEDS survey administered by the U.S. Department of Education and the National Center for Educational Statistics. This survey reflected institutional data from the 2007-2008 academic year. Collected data were analyzed using descriptive statistics and multiple linear regression techniques. The study was guided by the following research questions:

- Research Question One: Can institutional expenditures for student affairs / services predict college student retention rates?
- Research Question Two: Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?
 - Secondary Research Question Two: Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures?

Description of the Data

The study population consisted of all four-year, degree granting, not-for-profit, public and private colleges and universities who reported complete data surveys to the IPEDS for the 2007-2008 academic year (N = 1252). The entire population was utilized for this study due to the availability of the data from the pre-existing data set.

Demographics of the Population

The IPEDS survey collects many types of data from reporting institutions. Of the data points collected from the population studied, the following demographic information was obtained. Private, not-for-profit institutions made up the majority of the population, accounting for 63.60% (n=796) of the population. Public institutions comprised 36.40% (n=456) of the population. Doctoral / research institutions represented 19.10% (n=240) of the population, masters colleges and universities made up 43.20% (n=541) of the population, and baccalaureate colleges accounted for 37.7% (n=472) of the population. Institutional demographic data are shown in Table 4.1 and Table 4.2.

Table 4.1. Institutional Demographics by Institutional Control

	Private, not-for-profit	Public	Total
Frequency	796	456	1252
Percentage	63.60%	36.40%	100%

Table 4.2. Institutional Demographics by Institutional Mission

	Masters	Baccalaureate	Doctoral / research	Total
Frequency	540	472	240	1252
Percentage	43.2%	37.7%	19.10%	100%

Enrollment data from Fall 2007 were collected from each institution ($\bar{X} = 7308$). IPEDS classifies institutions by enrollment as very large, large, medium, small, and very small. In this study, very large institutions made up 9.90% (n=124) of the population. Large institutions accounted for 49.64% (n=622) of the population studied. Medium institutions comprised 17.24% (n=215) of the population. Small institutions represented 13.17% (n=165) of the population. Finally, very small institutions comprised 10.05% (n=126) of the study's population. Enrollment data and enrolled categories are shown in Table 4.3.

Table 4.3. Institutional Size Demographics

Enrolment	Classification	Frequency	Percentage
20,000 and above	Very Large	124	9.90%
10,000-19,999	Large	622	49.64%
5,000-9,999	Medium	215	17.24%
1,000-4,999	Small	165	13.17%
Under 1,000	Very Small	126	10.05%
Total		1252	100%

Analysis of Research Questions

Research Question One

Research question one asked if institutional expenditures for student affairs / services could predict college student retention rates. Using *SPSS 17.0*, a Pearson correlation test resulted in a significant, positive Pearson value for this comparison ($r=.422$; $p<.05$). This result led the researcher to conclude that institutional expenditures for student affairs / services could predict college student retention rates.

Additionally, all control variables used in the study showed positive, significant correlations when measured against college student retention rates as well. The control variables included selectivity dummy I (less selective institutions), selectivity dummy II (more selective institutions), enrollment, institutional control, mission dummy I (graduate institutions), mission dummy II (non-doctoral / research), and non student affairs / services expenditures. Table 4.3 lists the variable, *Pearson r* value for the correlation with college student retention rates, and significance level.

Table 4.4. *Pearson r* Correlation Values Measured against College Student Retention Rates

<u>Variable</u>	<u>Pearson <i>r</i> Value</u>
Student Affairs / Services Expenditures	.422***
Selectivity Dummy I (less selective)	.372***
Selectivity Dummy II (more selective)	.488***
Enrollment	.273***
Institutional Control	.086**
Mission Dummy I (graduate)	.105***
Mission Dummy II (non-doctoral / research)	.302***
<u>Non-Student Affairs / Services Expenditures</u>	<u>.376***</u>

Significance Level: **p* < .05 ***p*<.01 ****p*<.001

Research Question Two

In order to accurately determine research question two, “Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?” a multiple regression analysis was

conducted. Control variables were identified from the results of previous research on factors that affect student retention (Pascarella & Terenzini, 1991, 2005; Dale & Krueger, 1999; Flowers, Osterlind, Pascarella, & Pierson, 2001; Rumberger & Thomas, 1993; Upcraft, Gardner, & Barefoot, 2005). This body of literature aided the researcher in determining the order in which the variables were entered into the model. Variables were forced into the model in the following order: selectivity (SelDummy1 – less selective and SelDummy2 – more selective), institutional size (Enrollment), institutional control (Control), institutional mission (MissionDummy1 - graduate and MissionDummy2 – non-doctoral / research), expenditures for non-student affairs / services (NonSAExpend), and expenditures for student affairs / services (SAExpend). Results of the analysis for predictions of college student retention rates are discussed below then presented in Table 4.4.

In the first block, the institutional selectivity dummy variables were simultaneously entered into the model. Collectively, these variables made a significant contribution to the equation, accounting for a quarter of the variance ($R^2=.256$, $p<.001$). Next, the enrollment variable was added to the model in the second block. The introduction of this variable made a significant contribution to the equation as well (change $R^2=.029$, $p<.001$). When control was added to the model in the third block, it too made a significant contribution to the regression equation (change $R^2=.028$, $p<.001$) with the four variables in the equation now accounting for roughly one-third of the variance ($R^2=.313$, $p<.001$). In block four, the institutional mission dummy variables were simultaneously entered into the regression model. This addition resulted in a

significant contribution to the equation (change $R^2=.004$, $p<.05$; $R^2=.317$, $p<.001$).

Block five introduced expenditures for non-student affairs / services into the model. The result of this entry was also significant (change $R^2=.013$, $p<.001$; $R^2=.330$, $p<.001$).

Finally, in block six, expenditures for student affairs / services was entered into the equation. With all other variables held constant, the expenditure for student affairs / services variable significantly increased the variance in student retention (change $R^2=.018$, $p<.001$) affirming research question 2. Together, all predictor variables accounted for over one-third of the variance ($R^2=.348$, $p<.001$).

Table 4.5. Regression Analysis for Prediction of College Student Retention Rates

Block	Variable	R^2	Change R^2	Final β	t for Final β
Block 1	SelDummy1			.120	4.36***
	SelDummy2	.256***	.256***	.298	10.51***
Block 2	Enrollment	.285***	.029***	.074	1.73
Block 3	Control	.313***	.028***	.150	5.03***
Block 4	MissionDummy1			.017	.618
	MissionDummy2	.317***	.004*	.021	.514
Block 5	NonSAExpend	.330***	.013***	.092	2.54***
Block 6	SAExpend	.348***	.018***	.193	5.78***

Note. R^2 refers to R^2 after a given block. Significance level for R^2 refers to significance of F value for regression equation at the end of a given block. Change R^2 refers to change in R^2 due to addition of a new block. Significance levels for change R^2 refers to significance of increase in R^2 due to a given block. Final β shows standardized regression coefficient (beta weight) with all variables in the equation. t for final β indicates importance of the variable in the final regression equation. Significance Level: * $p < .05$ ** $p < .01$ *** $p < .001$

It should be noted that the Pearson's r correlation value for student affairs / services expenditures was .422 ($R^2 = .178$) and account for only 17.8% of the variance.

After controlling for important institutional characteristics, the final model was able to account for 34.8% of the variance ($R^2 = .348$), vastly improving the accuracy of the prediction model.

Secondary Research Question Two

To find the combination of conditions under which college student retention rates can best be predicted by student affairs / services expenditures, the final regression equation was examined. Table 4.5 reports the standardized betas for each variable and the significance of the variable to the final regression equation.

According to the analysis, selectivity was a significant indicator as to the prediction of college student retention rates. The positive beta weights show (a) that moderately selective institutions had higher retention rates than less selective institutions and (b) very selective institutions had higher retention rates than moderately selective or less selective institutions. Further, comparing the college student retention rates of very selective institutions against rates at moderately selective or less selective institutions was the more important of the two predictor variables ($\beta=.120$, $t=4.36$, $p<.001$ for comparison (a) versus $\beta=.298$, $t=10.51$, $p<.001$ for comparison (b)).

Institutional control, that is public or private not-for-profit, also demonstrated to be a significant predictor of college student retention rates ($\beta=.150$, $t=5.03$, $p<.001$). The positive beta coefficient indicates that private institutions have higher retention rates than public institutions when other variables were controlled.

Finally, both student affairs / services expenditures ($\beta=.193$, $t=5.78$, $p<.001$) and non-student affairs / services expenditures ($\beta=.092$, $t=2.54$, $p<.001$) were found to be

significant predictors of college student retention rates. Expenditures for student affairs / services was shown to be a stronger predictor college student retention than non-student affairs / services expenditures. Beta weights for enrollment and the institutional mission variables did not reach significance in the final equations and are not considered significant predictors of college student retention rates in this study.

Summary

The purpose of this chapter was to present the findings of the investigation of the relationship between expenditures for student affairs / services and college student retention rates. A total of 1,252 institutions were utilized as the population. The majority of the institutions represented were private (63.60%), masters level (43.2%), and large (49.64%) in institutional size. A significant, positive correlation was discovered between expenditures for student affairs / services and college student retention rates, indicating that there is a linear, predictive relationship between the variables.

After a multiple linear regression analysis was conducted, it was determined that institutional expenditures for student affairs / services could predict college student retention rates when other important institutional variables were controlled. Additionally, institutional selectivity, institutional control, non-student affairs / services expenditures, and expenditures for student affairs / services proved to be significant predictors of student retention. Institutional size and mission were not found to be significant predictors of student retention in this study.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to explore the relationship between expenditures for student affairs / services and student retention. An introduction to the study, review of literature, methodology, and presentation of findings has been presented. This chapter provides an explanation of the study, summarizes the findings, and provides implications for theory and practice. The content of the chapter will be discussed under the following sections: a.) review of relevant literature; b.) theoretical framework; c.) summary of findings; d.) discussion; e.) conclusions; f.) delimitations; g.) implications for theory, research, and practice; and h.) suggestions for future research and practice.

Review of Relevant Literature

College student retention has been one of the most discussed topics in higher education in the latter half of the twentieth century (Tinto, 2006). The ability for an institution to attract and retain its students has been the focus of numerous academic writings, theories, and initiatives in higher education. Theorists such as Spady (1971), Tinto (1975, 1987, 1993), Astin (1977, 1985), Cabrera, Nora, & Castaneda (1993), St. John, Paulson, & Starkey (1996), Rendon (1994), and Berger (1997, 2000-2001) have explored theoretical models from different angles to explain why students depart from the higher education process. Among those, Tinto's (1975, 1987, 1993) theory on student departure has been cited numerous times as the most conclusive description of the phenomenon (Berger & Braxton, 1998).

The social integration component of Tinto's (1975, 1987, 1993) theory focuses on the importance of formal and informal opportunities for social interaction among college students and those opportunities effect on students' decisions to persist in higher education. Within the context of the institution, the responsibility to create and support social interaction opportunities lies within the division of student affairs / services. Miller and Winston's (1991) definition of student affairs / services suggested that the division is mission bound to create opportunities for social interaction. To create these opportunities, however, proper funding must be in place to support these endeavors.

Since the 1960s, accountability has been a theme in higher education (Thelin, 2003). In light of difficult economic times, institutions are under increasing pressure to answer to legislators, taxpayers, and private citizens as to how colleges and universities are spending their money and what society receives in return (McLendon, Hearn, & Deaton, 2006). The call for accountability in higher education forced institutions to begin to define productivity and efficiency in terms of educational inputs and outputs. According to Schapiro (1996), productivity is a measurement of input per unit output. In higher education, however, inputs and outputs are varied, complex and difficult to measure. In fact, Johnstone (2001a) asserted there is a lack of professional consensus as to what should be the outcome of higher education. This lack of agreement has forced resource allocation entities to explore quantitative, easily obtainable ways to assess output in order to justify financial investment (Johnstone). As a result, comparing institutional inputs, in terms of resource allocations, with student outcomes has become popular in academic literature.

In the 1970s, researchers began exploring the relationship between institutions' financial inputs and student outcomes with mixed results. Early studies were unsuccessful in relating institutional expenditures to standardized test scores (Rock, Centra, & Linn, 1970), or future earnings (James, Alsalam, Contay, & To, 1989). However, more recent studies were contradictory in their findings. Institutional expenditures for research, instruction, public service, academic support, institutional support and student affair /services have been compared against a variety of student outcomes. These outcomes included student retention (Astin, 1993; Ryan 2004, Gansemer-Topf & Schuh, 2006), student persistence and graduation (Hayek, 2001), leadership development (Smart, et al., 2001), student engagement (Ryan, 2005; Pike, et al., 2006), quality of student effort (Hayek, 2001), and knowledge gain (Toutkoushian & Smart, 2001). The comparisons resulted in inconclusive and contradictory results. Of the student outcomes measured, college student retention indicators were found to be the most contradictory among studies when compared to institutional expenditures (Astin, 1993; Ryan, 2004; Gansemer-Topf & Schuh, 2006).

In a longitudinal study utilizing data gathered from the Cooperative Institutional Research Program (CIRP) survey, Astin (1993) found a positive relationship between expenditures for student affairs / services and college student retention, specifically at private colleges. Comparing data from 363 baccalaureate institutions, Ryan (2004) utilized information from the Integrated Postsecondary Data System (IPEDS) to positively link college student retention to expenditures for instruction and academic support. Ryan found no significant relationship to money spent on student affairs /

services, however. Using the same data sources as Ryan's study but focusing only on private institutions, Gansemer-Topf and Schuh (2006) supported Ryan's link to academic support expenditures, but negatively related college student retention to student affairs / services and institutional support expenditures. This contradiction in the literature led to the current research study.

Theoretical Framework

Theoretically, this study drew from Tinto's (1975, 1987, 1993) theory on student departure and Berger's (1997, 2000-2001) writings on institutional effects on college student retention. Tinto's (1975, 1987, 1993) theory on college student departure hypothesized that students leave higher education because they are unable to integrate themselves in the social and academic contexts of the institution. The students' lack of integration results in lower levels of student commitment to the institution and results in a higher probability that the student will leave the institution. Academic integration is defined as the student's ability to meet the expectations of the institution and to buy into the beliefs, values, and norms of the college or university. Social integration is the establishment of social relationships with members of the institution, including peers, faculty, staff, and administration. Tinto asserts that combining the student's initial commitment with these factors results in an explanation of the likelihood that a college student will persist in the educational process.

Berger (1997, 2000-2001) built on Tinto's model to explore organizational behavior dimensions that may affect college student retention. Berger theorized that a student's decision to remain at an institution was tied to the actions of the institution, or

institutional behavior. Institutional behavior manifests itself as the actions of the administration, faculty and staff; institutional policies and procedures; and institutional culture and norms. Berger asserted that these actions could have an effect on college student retention.

Combining tenets from Tinto's (1975, 1987, 1993) and Berger's (1997, 2000-2001) work, this study used these theoretical frameworks to explain college student retention as a function of organizational behavior. Specifically, this study viewed organizational behavior as how a higher education institution allocates resources to a specific functional area, student affairs / services (Gansemer-Topf, 2004; Gansemer-Topf, Saunders, Schuh, & Shelley, 2004; and Gansemer-Topf & Schuh, 2006). Berger's work was paired with Tinto's theory on the importance of social integration in a student's decision to persist at an institution and the role student affairs / services played in that decision. The resulting framework allowed the researcher to explore the research questions presented.

Summary of Findings

Demographics

The population used for this study included public and private institutions classified as baccalaureate, masters, or doctoral / research institutions by the 2000 Carnegie Classification system. A total of 1,252 institutions were used for the analysis, with the majority being private colleges and universities (63.60%). Most of the institutions in the population were classified as masters college and universities (43.20%). In regards to institutional size, institutions with enrollments of 10,000 to

19,999 students made up the greater part of the population (49.64%). The average enrollment for all institutions used in this study was 7,308.

Research Questions

The purpose of this study was to examine the relationship between institutional expenditures for student affairs / services and college student retention rates. Two major and one secondary research questions guided the study.

- Research Question One: Can institutional expenditures for student affairs / services predict college student retention rates?
- Research Question Two: Can institutional expenditures for student affairs / services predict college student retention rates when other important institutional variables are controlled?
 - Secondary Research Question Two: Under what combination of conditions can college student retention rates best be predicted by student affairs / services expenditures?

The study controlled for non-student affairs / services expenditures, institutional control, institutional selectivity, institutional mission, and enrollment.

For research question one, a statistical analysis yielded a significant Pearson correlation ($r=.422$), affirming that institutional expenditures for student affairs services are a significant predictor of college student retention rates. Research question two was investigated using a multiple linear regression analysis. The results indicated that college student retention can significantly predict college student retention rates when other important institutional variables are controlled ($R^2=.348$). For the purpose of this study,

those variables were identified as non-student affairs / services expenditures, institutional control, institutional selectivity, institutional mission, and enrollment. According to the findings from the secondary research question two, selectivity ($\beta=.120$, $t=4.36$, $p<.001$ for less selective institutions and $\beta=.298$, $t=10.51$, $p<.001$ for more selective institutions), institutional control ($\beta=.150$, $t=5.03$, $p<.001$), student affairs / services expenditures ($\beta=.193$, $t=5.78$, $p<.001$), and non-student affairs / services expenditures ($\beta=.092$, $t=2.54$, $p<.001$) were discovered to be significant predictors of college student retention. Enrollment ($\beta=.074$, $t=1.73$) and institutional mission ($\beta=.017$, $t=.618$ for graduate institutions and $\beta=.021$, $t=.514$ for non-doctoral / research) were not.

Discussion

The purpose of research question one was to determine if a relationship existed between institutional expenditures for student affairs / services and college student retention. This question was derived from conflicting findings in the literature. Astin (1993) found from a sample of private institutions, there was a positive effect between amount of money spent on student affair / services and college student retention. In 2004, Ryan studied a similar population, mostly private, baccalaureate institutions, and found a negative correlation between the two variables. Gansemer-Topf and Schuh's (2006) study of private, baccalaureate institutions found no effect between student affairs / services expenditures and college student retention. The results of this study supports and expands Astin's (1993) conclusion that the amount of money spent for student affairs / services is positively related to college student retention. While Astin's study focused on private institutions, this study included both public and private colleges and

universities and accounted for other control variables the previous three studies did not include. These results expanded the scope and generalizability of Astin's conclusion and warranted further investigation into this phenomenon.

The second research question that guided this study posed if retention rates could be predicted based on the amount of money spent on student affairs / services. Previous research (Cunningham, 2005; Pascarella & Terenzini, 1991, 2005; Upcraft, Gardner, & Barefoot, 2005) on college student retention indicated that institutional size, institutional control (public versus private), institutional selectivity, and institutional mission affected a student's decision to persist at an institution; therefore, the current study controlled for these factors. Additionally, non-student affairs / services expenditures were controlled for possible correlation and shared variance. Once these important institutional characteristics were accounted for, this study found that expenditures for student affairs / services were a significant predictor for college student retention.

Secondary research question two asked under what combination of conditions college student retention best could be predicted. The analysis showed that institutional selectivity was the best indicator for student retention. In fact, the more selective the institution, the more likely student retention rates could be predicted. These results support previous findings from over a decade ago on the direct correlation between institutional selectivity and college student retention (Pascarella & Terenzini, 1991).

In this study, the second best predictor of college student retention was shown to be institutional expenditures for student affairs / services. This indicates that of the institutions in the study, the more they spent on student affairs / services, the more likely

students were to be retained. Institutional control, that is public versus private, was found to be the third best indicator for college student retention. The analysis revealed that private institutions were more likely to retain students than public institutions. Finally, institutional expenditures other than those for student affairs / services were found to be the fourth best predictor of college student retention. The results of this study add to existing literature on this topic, providing new implications for theory and suggestions for practice in the field of student affairs / services.

Conclusion

The results of this study produced three major findings from which researchers and practitioners can make conclusions. First, this study showed that despite conflicting findings in previous studies, there is a significant, positive relationship between the amount of money an institution spends on student affairs / services departments, programs, and initiatives and the institution's student retention rate. Second, this study concluded that not only is there a positive relationship between student affairs / services expenditures and college student retention rates, but expenditures are a major predictor for student retention. In fact, other than how selective an institution is, the next best indicator of college student retention is the amount of money spent on programs and services for student affairs / services. Finally, the results of the study concluded that college student retention could be optimally predicted at institutions that were very selective, spent more money on student affairs / services-type programs and services, were privately controlled, as well as spent more money on non-student affairs / services-type programs and services.

Delimitations

There were four delimitations to this study. Data were collected from self-reported surveys maintained by the IPEDS data base. First, variation in interpretation and institutional organization could account for discrepancies in reporting in the expenditures for student affairs / services category. This was controlled by accounting for institutional mission, as classified by the Carnegie classification, under the rationale that similarly classified institutions would have similar organizations and, thus, similar expenses. Second, composite expenditures for graduate and undergraduate student affairs / services were compared against retention data for undergraduate students only in this study. This discrepancy could account for variation in the internal validity of the results of the study. Third, the study did not take into account other extraneous variables that have been shown in the literature to affect retention (i.e. physical environment, student characteristics, institutional characteristics, etc.). Finally, the study utilized the 2000 Carnegie classification system, not the 2005 classification. The use of this less descriptive classification did not allow for within-group differences in the final analysis.

Implications for Theory, Research, and Practice

Implications for Theory

This study used Tinto's (1975, 1987, 1993) theory on college student departure and Berger's (1997, 2000-2001) work on institutional behavior's effects on college student retention as theoretical foundations for the inquiry. The results of the study supported both theories. Most directly, this study supported Berger's assertions that institutional behavior can affect college student retention. In the case of this study, the

institution's resource allocation process was defined as an institutional behavior. While Berger's work does not explicitly define resource allocation as an institutional behavior, the allocation process did match Berger's definition of institutional behavior. The results of this study directly tied this organizational behavior, resource allocation, to college student retention, indicating that there was, indeed, a correlation and an effect. These results can be used to expand the work of Berger to include a new aspect of the effect of organizational behavior on college student retention. The impact of this study's findings on Berger's theory is noteworthy and warrants further exploration and adaptation of the theory.

The findings of this study also supported Tinto's (1975, 1987, 1993) theory on college student departure. Tinto asserted that college students will be retained if they are integrated academically and socially into the institution. Focusing specifically on the social integration piece, this study tied the responsibility of formal and informal social integration to the institutional functional area that, by professional definition, is responsible for these interactions: student affairs / services. Under this premise, the study showed that an investment in student affairs / services resulted in a student's likelihood to persist at an institution and supported Tinto's theory as to the importance of social integration. These findings add another layer of support for Tinto's comprehensive theory and provide further information to explain why students prematurely depart higher education.

Implications for Research

One of the primary objectives of this research project was to investigate the conflicting research reports on the relationships between institutional expenditures for student affairs / services and college student retention. Utilizing a large, diverse population, the study was able to definitively show a strong relationship does exist between expenditures for student affairs / services and college student retention, even when other college student retention-related variables are controlled. This finding provides researchers and practitioners with additional information that may impact their work in determining how institutions can best retain their student populations.

In the current body of literature, the comparison of institutional expenditures to student outcomes has produced conflicting results, a fact noted by Pike, et al. (2006). Pike et al. observed that it was impossible to build a conceptual model to explain the relationship between expenditures and student outcomes under the current body of research. Ryan (2004, 2005) and Gansemer-Topf and Schuh (2006) suggested expanding the scope and depth of previous research to focus on the relationship between specific expenditure categories and particular student outcomes. The current study accomplished this, yielding an explanation of the relationship between expenditures for student affairs / services and college student retention. While the results of this study alone cannot support the formation of a conceptual model of the relationship between all institutional expenditures and student outcomes, it does add a solid piece of literature to be used by future researchers in the construction of a conceptual model.

Implications for Practice

The results of this study provide implications for practice as well. Miller and Winston's (1991) imply the creation of formal and informal social and educational opportunities outside of the classroom organizationally lies within the division of student affairs / services definition of student affairs / services, Integration into the social landscape of an institution is a major factor in retaining college students in the educational experience, according to Tinto (1975, 1987, 1993). Therefore, the educational and social opportunities provided by the division of student affairs / services play a vital role in a student's decision to persist or leave the institution. The results of this study supports this assertion, in that the amount of money spent on student affairs / services was found to be a strong predictor of college student retention rates. For the campus community, this provides confirmation that the work done in student affairs / services is vital to the retention of students, and the success of the institution. At institutions where student affairs / services initiatives are seen as unimportant or a waste of resources, this study provides practitioners with quantitative data to make a case for needed resources. The results of this study should be shared with all institutional constituents in the justification of resource allocations to student affairs / services.

When combined with solid assessment data, as to the effectiveness of student affairs / services initiatives and programs, the results of this study provide managers with a persuasive piece of quantitative information from which to build a strong case for increased financial support of their functional areas. More resources would allow practitioners to evaluate and strengthen existing programs as well as design and

implement new ones. However, with increased resources come increased responsibilities to assess the efficiency and effectiveness of these programs. While student affairs / services practitioners should view the results of this study as a “victory” in terms of justification for their energies and efforts to increase retention, they should also see it as a charge to become more efficient and effective in retention programming efforts.

The responsibility of retaining first-year college students does not lie solely with the division of student affair / services, however. While this study did focus on student affairs / services’ role in social integration, attention should be given to their role in the academic integration of the student as well. Student affairs / services practitioners should think institutionally as they seek new opportunities to engage students socially and academically. Financial investments in partnership programs with academic departments and community entities should be seen as wise investments that not only promote student learning, but also contribute positively to student retention. These investments demonstrate to faculty and administration that student affairs / services acknowledges the value of partnerships and strategic initiatives toward the success of students and the institution as a whole.

According to this study, institutional characteristics such as selectivity, control, and non-student affairs / services expenditures do play a role in predicting retention. The results suggest students are more likely to persist at highly-selective, private institutions that are well funded. This is not meant to be discouraging to practitioners at less than ideally funded institutions. Rather, this study should encourage practitioners across the division of student affairs / services to explore creative programming and engage in

national discussions on college student retention to assess and adapt best practices that are effective at their peer institutions. Additionally, the results of this study should spur practitioners to conduct solid research and assessments on their student population to investigate institutional-specific factors that lead to departure or assist in retention so that more targeted, data driven decisions about programming can be made.

As Stewart (2007) stated, chief student affairs / services officers value the fiscal responsibilities they are given and work to secure and allocate funding to support the important work of their functional areas. During institutional budget allocation processes, chief student affairs / services officers find themselves competing with multiple campus constituencies for funding. A solid understanding of educational finance theory and budgetary practices is vital so student affairs / services administrators can secure as much funding as possible. As such, a change in the curriculum of graduate preparatory programs for higher education leadership and student affairs / services to include more business finance courses is warranted. Additionally, aspiring chief student affairs / services officers should consider advanced study in business to complement studies in educational leadership or student affairs.

The result of this study helps researchers and practitioners better understand the institutional factors that impact students' departure from higher education, but it does not provide much insight as to why students actually persist. It would be imprudent to interpret this study as an implication to blindly inject more money into student affairs / services as a way to retain more students. Rather, the results should imply that carefully researched, purposeful placement of programs is the key to increasing student retention.

Additionally, financial support should not be entirely directed toward retention of first year students. Retaining students from year one to year two is only one-third of the challenge. Implementing other retention programming, such as sophomore retention initiatives, is important in ensuring that students persist in their education and is a wise investment for the student affairs / services division.

Suggestions for Future Research and Practice

While the findings from this study are significant to a better understanding of institutional expenditures and college student retention, it also provides a basis from which other research studies could be conducted as well as foundations for future student affairs / services practice. First, to obtain a better understanding of how expenditures for student affairs / services affect the campus population, future studies should compare these expenditures to other measures of institutional interest, such as graduation rates, sophomore retention rates, student engagement, or academic success. Replacing antidotal assertions with empirical evidence of how instrumental student affairs / services expenditures are to student success could be useful to student affairs / services budget managers to justify allocation requests.

Second, the current study approached student affairs / services expenditures from a macro-level, measuring college student retention against overall expenditures for student affairs / services. A future study where college student retention was compared to expenditures for individual student affairs / services functional areas would provide practitioners and researchers with information as to what affect individual functional areas have on college student retention. This could provide student affairs / services

managers with important information as to a functional area's effectiveness in retaining students and could be a consideration in resource allocation processes.

Third, only four-year, not-for-profit, public and private institutions were considered in the population for this study. Relationships between expenditures for student affairs / services and college student retention are not limited to this population, however. As enrollments in the two-year community and technical college system continue to rise, a replication of this study with that population could be useful for student affairs / services administrators to assess expenditure effectiveness. A similar study could be conducted in for-profit institutions as well.

Finally, the results of this study provide empirical evidence to institutional budget managers that a financial investment in student affairs / services supports one of the most important measures of institutional effectiveness, student retention. In practice, student affairs / services professionals could use the results of this study to validate budget requests for creating new strategic programming and expand existing programs geared toward college student retention. Although it is important to understand that allocating funds to student affairs / services is not a definitive way to increase student retention, this study provides practitioners with another piece of justification for resources requests.

APPENDICES

Appendix A

Research Compliance Approval

Dear Mr. Umfress,

The Clemson University Office of Research Compliance (ORC) has determined that the project identified above **does not involve human subjects** as defined in the Federal regulations governing the protection of human subjects in research [45 CFR 46.102(f)] and is, therefore, **not subject to IRB review**.

As per your communications with Ms. Becca Alley and my investigation of the Integrated Postsecondary Educational Data System, at this time, this project will not involve the collection of data “about” living individuals, or the use of “identifiable private information” about living individuals. Therefore, IRB review is not required.

Please contact this office again if there are any changes to this project that might bring it under the purview of the IRB. It is the responsibility of the ORC to determine whether any specific research project falls within the definition of research with human subjects, as provided by Federal regulations and institutional policy.

Thank you for contacting me to check on whether your project required IRB review and approval.

Good luck with this project and please feel free to contact me if you have any questions.

Best,

Laura

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Laura A. Moll, M.A., CIP  
IRB Administrator  
Office of Research Compliance  
223 Brackett Hall  
Clemson University  
Clemson, SC 29634-5704  
lmoll@clemson.edu  
Phone: 864-656-6460  
Fax: 864-656-4475  
[www.clemson.edu/research/compliance/irb/](http://www.clemson.edu/research/compliance/irb/)

## Appendix B

### IPEDS Survey Components and Data Collection and Dissemination Cycle

| <b>Survey Components</b>      | <b>Collection Period</b> | <b>Data Collected</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Institutional Characteristics | Fall                     | Data collected in the Institutional Characteristics survey provide general information about the institution. Data collected include: <ul style="list-style-type: none"><li>• Institution address, telephone number, and website;</li><li>• Educational offerings and mission statements;</li><li>• Control/affiliation, award levels, and calendar system;</li><li>• Admissions requirements; and</li><li>• Student charges, including tuition and required fees and room and board charges for institutions with first-time, full-time degree/certificate-seeking undergraduate students.</li></ul> |
| Completions                   | Fall                     | Completions data are collected for award levels ranging from postsecondary certificates of less than 1 year to doctoral degrees. Data collected include: <ul style="list-style-type: none"><li>• Degree completions by level and other formal awards by length of program, by race/ethnicity and gender of recipient, and by program.</li></ul>                                                                                                                                                                                                                                                       |
| 12-Month Enrollment           | Fall                     | 12-month enrollment data are collected for undergraduate and graduate levels. The 12-month reporting period selected by the institution is either July 1-June 30 or September 1-August 31. Data collected/calculated include: <ul style="list-style-type: none"><li>• Unduplicated headcounts by level of student and by race/ethnicity and gender,</li><li>• Instructional activity (contact or credit hours); and</li><li>• Full-time equivalent (FTE) enrollment (calculated based on instructional activity).</li></ul>                                                                           |
| Human Resources               | Winter                   | Data are collected as of November 1 of the current academic year. Employee headcount data are collected by:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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- Full- and part-time status;
  - Function or primary occupational category; and
  - Faculty status and tenure status (if applicable).

Data are collected as of November 1 of the current academic year, on the number of full-time instructional faculty by:

- Rank, gender, and length of contract;
- Total salary outlay; and
- Fringe benefits received.

Additional data (i.e. race/ethnicity demographics) are collected from institutions on a biannual basis.

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|-----------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fall Enrollment       | Spring | <p>Fall enrollment data are collected for all students enrolled in credit-bearing courses/programs which could potentially lead to awards ranging from postsecondary certificates of less than 1 year to doctoral degrees. Data collected include:</p> <ul style="list-style-type: none"> <li>• The number of full and part-time students enrolled in the fall by level, race/ethnicity, and gender;</li> <li>• Residence and high school graduation status of first time, first-year students (in even years);</li> <li>• Age of students (in odd years)</li> <li>• Cohort numbers to compute retention rates.</li> <li>• Student-to-faculty ratio</li> </ul> |
| Finance               | Spring | <p>This component collects data related to the financial condition of the institution. Data collected include:</p> <ul style="list-style-type: none"> <li>• Revenues by source (e.g., tuition and fees, government grants and contracts, private gifts);</li> <li>• Expenses by function (e.g., instruction, research, academic support, institutional support);</li> <li>• Assets and liabilities</li> <li>• Scholarships and fellowships</li> </ul>                                                                                                                                                                                                          |
| Student Financial Aid | Spring | <p>Financial aid data are collected for undergraduate students. Data are collected regarding federal grants, state and local government grants, institutional grants, and loans. Data collected include:</p> <ul style="list-style-type: none"> <li>• Number of students receiving each type of financial assistance; and</li> </ul>                                                                                                                                                                                                                                                                                                                           |

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- Average amount received by type of aid.

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|------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Graduation Rates | Spring | <p>Graduation rates data are collected for full-time, first-time degree and certificate-seeking undergraduate students . Data collected include:</p> <ul style="list-style-type: none"> <li>• Number of students entering the institution as full-time, first-time degree or certificate-seeking students in a particular year (cohort), by race/ethnicity and gender;</li> <li>• Number of students completing their program within a time period equal to one and a half times (150%) the normal period of time; and</li> <li>• Number of students who transferred to other institutions</li> </ul> |
|------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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|--------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Graduation Rates<br>200% | Spring | <p>Graduation rates data are collected for full-time, first-time, degree- and certificate-seeking undergraduate students. Numbers of students who completed within their program's normal time to completion, 150% of normal time, and 200% of normal time are used to calculate the graduation rates.</p> |
|--------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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Source: National Center for Educational Statistics. (2009d). *Integrated Postsecondary Education Data System Survey Components and Data Collection and Dissemination Cycle*. Retrieved September 25, 2009 from [http://nces.ed.gov/ipeds/resource/survey\\_components.asp#surveycomponents](http://nces.ed.gov/ipeds/resource/survey_components.asp#surveycomponents).

## Appendix C

### Derivation of Selected Variables

Some variables used in this study were derived from a variety of components and computations. The following provides the reader with a detailed description of how the variables were generated.

- *Institutional Expenditures for Student Affairs / Services* – This variable was generated by summing student affairs / services expenditure data from public and private, not-for-profit institutions as reported on the 2008 IPEDS Survey.
- *Non-Student Affairs / Services Expenditures - Public & Private, Not-for-profit Institutions* - This variable was generated by subtracting institutional expenditures for student affairs / services from total institutional expenditures at public and private, not-for-profit institutions as reported on the 2008 IPEDS Survey.
- *Institutional Mission* – The IPEDS data set categorized institutions considered for this study by the 2001 Carnegie Classification system into one of six groups. For the purpose of this study, institutions identified as baccalaureate colleges – general and baccalaureate colleges – liberal arts were combined into one category: baccalaureate colleges. Similarly, Masters Colleges and Universities I and Masters Colleges and Universities II were combined into one category: masters colleges and universities. Doctoral / research – extensive, and doctoral research – intensive were combined to form the doctoral universities category.

- *Institutional Selectivity* - Replicating Cunningham's (2005) creation of an institutional selectivity variable, this study calculated a selectivity score based on several variables. Those variables were the number of applicants for Fall 2007; the number of students admitted for Fall 2007; the 25<sup>th</sup> and 75<sup>th</sup> percentiles of the ACT and SAT scores; a flag indicating an institution's open admission policy, and a flag indicating test score requirements. Institutions reporting an open admission policy were pulled from the data source and formed into a separate category. For non-open admission institutions, the following methods were used to create the institutional selectivity variable:
  - ACT scores were converted to SAT scores using ACT-SAT Concordance scale (ACT, 2009).
  - A grand ACT/SAT score was calculated for institutions that reported both ACT & SAT scores by averaging reported SAT and converted ACT scores for both the 25<sup>th</sup> and 75<sup>th</sup> percentiles.
  - An SAT mid-point was calculated between the 25<sup>th</sup> and 75<sup>th</sup> percentiles by averaging the two scores.
  - The SAT mid-point was converted to a standard z-score and multiplied by 100 ( $\mu = 1017$ ,  $\sigma = 210$ ) to produce a standardized SAT score (College Board, 2007).
  - A variable, percent admitted, was calculated by dividing the number of students who were admitted by the number that applied. This number

was multiplied by 100 and subtracted from one in order for the data to match the increasing direction of the SAT mid-point variable.

- The standardized SAT score and the percent admitted score were equally weighted by averaging the two scores. This produced the institutional selectivity score.
- The institutional selectivity scores were divided into selectivity categories – very selective, moderately selective, and minimally selective – based on breaks in the distribution
- Institutions that did not require test scores and institutions with open admission policies were assigned to the minimally selective category.

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