1-1-2011

A Case Study of First-Year Persistence of Marshall University Freshmen

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A CASE STUDY OF FIRST-YEAR PERSISTENCE OF MARSHALL UNIVERSITY FRESHMEN

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Dissertation submitted to the Faculty of the
Graduate College of Marshall University
in partial fulfillment of the
requirements
for the degree of

Doctor of Education
in
Curriculum and Instruction

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August 2011

Keywords: departure, early-alert, first-year, persistence

ABSTRACT

College enrollment is rising but there has not been a corresponding increase in graduation rates. Nationwide, 30% of students who enter college do not return for their sophomore year. This case-study was conducted to determine what factors influenced the first-year persistence of the 2009 Marshall University freshmen cohort. This research used extant data from two *MAP-Works* surveys and Marshall University's student academic management system. Data from a cohort of 467 students were analyzed using logistical regression to determine which factors, if any, were statistically significant predictors of persistence. Logistic regression analysis produced statistically significant relationships with 27 pre-entry characteristics, 12 student satisfaction variables, four enrollment profile variables, and three academic performance variables. The results of this study indicate that the persistence of the 2009 Marshall University freshmen cohort was influenced moderately by pre-entry characteristics, student satisfaction, enrollment profile, and to a much higher degree, academic performance. It appears that academic integration is more important for persistence than social integration. The findings of this study suggest that a commitment to education is the predominant influence on persistence. Students who persisted in this cohort exhibited academic behaviors and attitudes that were related to a commitment not only to completing a college education but also to Marshall University. Persisters became satisfied with their academic life and developed positive relationships with peers. Commitment to the completion of the freshmen year and subsequent commitment to Marshall University was strengthened by the interactions with the university's academic and social systems making what happened once students were on campus the most influential aspect of first-year persistence.

DEDICATION

This dissertation is dedicated to my family. There is no way I could have accomplished this without their support and encouragement. To my husband Mark thanks for the patience and the support at home and at work. To my son Jacob thanks for the music and secret hugs. To my son Eli thanks for all the Cokes and all the giggles. To my father thanks for being the first Dr. Pauley and for being an inspiration to teach in higher education. And last but by no means least to my mom--every doctoral student should have a Gloria/Mom/Nana. I could not have done this without the house cleaning, laundry, after school care, dinners, homework help, vicarious vacations, dog-sitting, and most of all, the laughs.

ACKNOWLEDGMENTS

There are many people who helped me persist in completing this endeavor. First and foremost many thanks to Dr. Rudy Pauley for being my dissertation chair and believing in me and in this project. You let me work the way I needed to and were there to intercede at all the right times. Your guidance and expertise made this project a rich experience and stretched me to think beyond the obvious. Dr. Ron Childress, you have been so supportive throughout my entire program. Your willingness to allow me to tailor this experience to my needs is most appreciated. Dr. Jim Sottile, thank you for serving on my committee and for the assistance with the statistical design. Dr. Cindy Daniel, thank your words of encouragement and all your hard work serving on my committee.

Dr. Mary Beth Reynolds, thank you for all your help in obtaining these data and for your insight on freshmen persistence. It is my hope that this research will be useful to you and all students who want to succeed. Dr. Sam Securro, I appreciate your willingness to walk me through logistical regression and being available to answer even the most trivial statistics questions. Dr. Edna Meisel, thank you for getting me over my fear of statistics. Edna Thomas, behind every successful doc student is you.

Melanie White, my fellow Panerian, you made this process so much more fun. Thanks for all the Saturday mornings, the late night texts, and the prayers. Special thanks to Keri Ferro and Ashley Stephens, my fellow doctoral students, who kept things lively. And finally, to my University of Charleston colleagues, too numerous to name, you helped me through this process by allowing me to take the time to do this. This research was not only for me but for our students. We do make a difference.

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CHAPTER ONE: INTRODUCTION

College enrollment rates have increased from 58% to 68.6% in the past 20 years (United States Department of Education, 2009). In 2010, however, for every 100 students enrolled in college, only 73 returned for a second year and only half graduated within five years (ACT, Inc., 2010). The national five-year graduation rate for four-year institutions has remained relatively stable over the past twenty years with overall graduation rates of 52.3 % in 2010 (ACT, Inc., 2010). Private institutions have a higher five-year completion rate of 57.2 % than the 43.4 % graduation rate of public institutions.

A college education is becoming more important in today's economy. Between 1992-2009, the number of jobs for college graduates increased by 17 million while the number of jobs for high school graduates remained relatively unchanged (United States Department of Labor, 2010a). In addition to the increase in jobs for college graduates, unemployment rates are lower than for workers with less education. In September 2010, the national average unemployment rate for college graduates was half of the 10% unemployment rate for high school graduates (United States Department of Labor, 2010b). Even with the rise in unemployment since 2007, the rate for college graduates did not rise as dramatically as the rate for those with less education. Income levels are also higher for college graduates. In 2009, college graduates earned nearly twice as much per week as high school graduates (United States Department of Labor, 2010b).

Tuition costs have increased faster than the rate of inflation and when a student does not persist past his first year, the cost is great not only to the student himself but also

to the state and federal governments (Schneider, 2010). On average, a student receives as much as $10,000 in state grants and subsidies per year for each year of college he attends. Nationally, during the five-year period of 2003-2008, students who did not return for their second year of college received $1.4 billion in state aid and $1.5 billion in federal aid. State appropriations to colleges and universities during this five-year time period for the education of students who did not persist past their first year totaled $6.2 billion dollars (Schneider, 2010).

Labor statistics clearly indicate that a college education has personal economic benefits as evidenced by less unemployment and higher salaries (United States Department of Labor, 2010a; 2010b). In addition to these personal economic benefits, there are also public economic benefits such as increased tax revenues on taxable income, increased productivity due to an educated workforce, increased consumer consumption of housing, transportation, and food, and an overall decrease in the financial support of the government (Institute for Higher Education Policy, 1998).

Although the economic importance of a college education cannot be overlooked, there are other important influences of a college education to consider. The Institute for Higher Education Policy (1998) outlines several personal and public social benefits of a college education. These include: increased life expectancy, the ability to make effective consumer decisions, overall improved quality of life, lower crime rates, increased charitable contributions, increased civic awareness and life, increased use and appreciation of technology, and an increased appreciation of diversity. The Institute for Education Policy's report makes a compelling argument for a college education that goes

beyond personal benefit but extends to society as a whole. They assert that an educated society is one in which all benefit, educated or not.

With both economic and societal benefits, attention on higher education is often focused on increasing access, enrollment, and completion. Although college enrollment rates have increased, graduation rates have not. For the past 40 years researchers have focused on the concept of persistence in college in an attempt to disseminate the reasons why students leave prior to graduation. The reasons students depart before graduation are complex and may be hard to determine. Even though each student's decision or circumstances may be unique, several theories have emerged that attempt to explain why students fail to persist to graduation.

Theoretical Framework

According to Tinto (1993), the decision to depart college before graduation is a longitudinal process based on multiple factors such as demographic characteristics, prior education, academic performance, or satisfaction with the college experience. Some of these factors are innate in a student's background including ethnicity, family socioeconomic status, sex, high school experiences and high school performance, and help to define the student's predispositions toward education (Tinto, 1993). Other characteristics such as college academic performance, interactions with peers, and educational goals are formed or altered after entry to college and may be amenable to interventions within the collegiate experience. Students enter college with unique backgrounds, educational goals and a commitment to the institution. As the interactions with the academic and social systems occur, integration occurs within both systems which reinforces the goals and the commitment to the institution. Depending on their

backgrounds, interactions, and experiences, these integrations differ for every student and influence the decision to depart or persist. Universities can use programmatic approaches to intervene to increase the chances that a student will persist. However, before interventions can be implemented, the needs of a student or group of students must be ascertained to determine what interventions would be most beneficial to the student and the university.

Although there are several generalizations that can be made for student departure, institutions need to have a data-based understanding of why their students choose to either depart or to persist to graduation. Persistence behavior is a longitudinal process that is influenced by a student's background characteristics and the result of what occurs once the student is on campus (Tinto, 1993). Not all students will persist and institutions need to understand their institutional, academic, and social culture in an effort to identify students who should persist and those that regardless of intervention will depart (Tinto).

Often the terms persistence and retention are used interchangeably as are the terms departure and attrition. For this research, the terms *persistence* and *departure* are used. Although there have been a large number of studies on college persistence, there is not a consensus on the definition of persistence (Luti, Parish-Plass, & Cohen, 2003). For this research, the following definitions are used:

Persistence is a student's continued enrollment at an identified university (Leppel, 2005).

Departure occurs when a student leaves an identified institution prior to obtaining a degree (Tinto, 1993).

At the most basic level, persistence is an indicator of student success. Even though some students enter college with the attitudes and skills necessary to succeed, many students do not persist. It is what happens after the student arrives on campus that often determines if they are successful in terms of persistence and, ultimately, graduation. Many studies use academic measures as predictors of student success but according to Kern, Fagley, and Miller (1998), "Universities are faced with balancing the need to provide educational opportunities and to assure that students have adequate preparation for success in higher education" (p. 26). They assert that it is not enough for universities to rely on academic measures alone without also focusing on student attitude and motivation. Their research indicates that whereas academic measures such as grade point average (GPA) and ACT scores have a direct impact on persistence, these academic measures are influenced by attitude and motivational factors. This research is important because it shows that student success as it pertains to persistence should be considered as more than just academic achievements but include affective characteristics. Interventions to increase success must focus on all aspects of a student's educational experience.

Persistence Tools for Institutions

Many colleges and universities strive to increase student persistence and graduation rates and many use early alert programs designed to help in the persistence effort on an individualized institutional level. An early alert program is a proactive system that identifies students who are at risk of potential departure (Cuseo, n.d.). These programs may rely on referrals from faculty members or other university entities such as residence life or athletic coaches. Students who may show signs of struggling academically or, socially which places them in a high-risk situation of academic failure or

attrition are identified in this process. There are also commercially based early alert programs that collect data through student surveys and student academic records to aggregate student academic and affective attributes in order to identify students who are at risk of attrition. Institutions can use these data to counsel at-risk students, provide programming from areas such as student and residential life, or use other strategies to reduce attrition.

Commercially based early alert programs use student perceptions to ascertain student satisfaction with the academic and social climates of an institution. Students are asked to rate their experiences with instruction, academic advising, student services, personal relationships, and other campus programs and initiatives at the beginning of their undergraduate experience. These data can be used to create a profile of both the individual student and the group of students entering the institution that can then be used by the university to plan and implement intervention strategies that are designed to ameliorate weaknesses or increase strengths of the students and existing institutional programs.

Statement of the Problem

West Virginia ranks 28th in state and 27th in federal monies spent on students who did not persist past their first year of college during the five-year period of 2003-2008 (Schneider, 2010). West Virginia appropriated $77.2 million to public educational institutions of higher education and another $22.4 million in grants for students who did not return for their second year of college. Federal student grants to West Virginia first-year only students equaled $21.5 million. Using aggregated data from the Integrated Postsecondary Education Data System (IPEDS), the Delta Project, and the College

Board, College Measures (2010) ranks West Virginia 42nd out of 54 states and US territories with a public institution graduation rate of 45.1% and 43rd in first year persistence (72.3%). West Virginia ranked 52nd in efficiency as indicated by cost per student ($10, 560) and per full-time equivalent (FTE) and 48th in cost of degree ($50,545). Even with the relatively low cost of educating students, West Virginia ranks 31st in cost of attrition of first year students which is reported as $29 million annually.

Marshall University, located in Huntington, West Virginia, is a public four-year institution that offers two associate, 51 baccalaureate, and 52 graduate degrees including those at the master's, doctoral, and first professional levels (Marshall University, 2010). At the end of the Fall 2010 semester, total enrollment was approximately 14,000 students with 10,020 undergraduates. Eighty-five percent of undergraduates were full-time and approximately 80% were in-state residents. Males comprised 44% of the undergraduates and females 56%. Ethnic composition was 87% white, 5.6 % Black or African American, 1.4% Hispanic, 0.9% Asian, 0.4% American Indian or Alaska Native, and 3.4% unknown. Of the undergraduates, approximately one-fourth were freshmen (Marshall University, 2010). Incoming freshmen had an average ACT composite of 22.1 and an average high school GPA of 3.3. Marshall University's freshmen retention rate has remained relatively stable since 1991 with a high of 75% from Fall 2000 to Fall 2001 and a low of 70% in Fall 1994 to Fall 1995 and Fall 1995 and 1996. From 2006-2009, the retention rate was 71%. In 2009, the retention rate dropped to 70.4% (Marshall University, 2010).

Marshall University's five-year graduation rate is 38.5 % which is slightly lower than the national average for public institutions (The Education Trust, 2009). Marshall

University's first-year persistence rate of 70.4% is also slightly lower than the national average for public institutions. The cost per student per FTE at Marshall University is $10,212 with 62% allocated for instructional support, 11% for institutional support, 10% for academic support, and the rest for student services and operational and maintenance costs (College Measures, 2010). Overall, the annual cost of Marshall University's first-year attrition is $4.9 million.

In the fall of 2009, in an effort to assess risk of attrition for individual students, Marshall University implemented the early alert program MAP-Works © from Educational Benchmarking, Inc., for the freshmen cohort. Of the 1,958 first-time freshmen, 1,340 took The *MAP-Works Transition Survey* which was available in September and October. *The MAP-Works Check-up Survey* conducted in November had 414 responders (31% return rate). A second check-up survey, offered in February of 2010, had 316 responders (24% return rate). Those students identified by the transition survey as low-risk had a fall-to-spring retention of 96.8%, medium-risk students returned at a 92.4% rate and high-risk students returned at an 82.1% rate.

Purpose of the Study

MAP-works appeared to have predictive value for the 2009 freshmen cohort but it was unknown precisely which individual or aggregate factors were the most predictive or where institutional level resources are best implemented to improve first-year persistence. This case study provided a data-driven description of persistence of a cohort of Marshall University freshmen that will enable intervention development and implementation to address specific issues related to student attrition in the first year. This study also

provided an opportunity to validate Tinto's model of student departure and the predictability of MAP-Works within the context of Marshall University.

Research Questions

The research questions for this study were:

1. To what extent, if any, do selected pre-entry characteristics as measured by *The MAP-Works Transition Survey* predict persistence of Marshall University freshmen?
2. To what extent, if any, does student satisfaction as measured by the *MAP-Works Check-up Survey* predict the persistence of Marshall University freshmen?
3. To what extent, if any, does enrollment profile predict the persistence of Marshall University freshmen?
4. To what extent, if any, does academic performance predict the persistence of Marshall University freshmen?

Operational Definitions

For the purposes of this study, the following definitions were used:

Pre-entry characteristics are those attributes as reported by students which are present upon entry into college. Pre-entry characteristics include those attributes that are reported in the *MAP-Works Transition Survey*:

1. Student characteristics including sex, family background, financial means, and prior educational experience.
2. Academic goals and commitment to education and institution.
3. Self-assessment of academic and management skills, academic self- efficacy, and stressors.

4. Academic experiences including perceived difficulty and academic behaviors such as class attendance, note-taking abilities, class participation, and study habits.
5. Social experiences including peer connections, residence status, and homesickness.
6. Academic adjustment.
7. Sense of belonging.
8. Overall evaluation of the University.

Student satisfaction includes academic integration which is the self-reported perception of alignment with academic standards of the academic program and social integration which is the self-reported perception of support from peers, faculty, and staff of the university. Student satisfaction was reported through the *MAP-Works Check-up* survey.

Enrollment profile includes declared major upon enrollment and number of courses attempted.

Academic performance data include first semester GPA (Fall 2009) and first year cumulative GPA (2009-2010).

Persistence is the return of students for the Fall 2010 academic term.

Departure occurs when a student did not voluntarily return for the Fall 2010 academic term.

Significance of Study

This study will be of value to students, parents, faculty, and administrators. It identified factors that influence the decision to depart college prior to matriculation and

specifically in the first year. A profile of persisters and departers was developed that identified underlying reasons for attrition that will allow for modification of existing programs, policies, and procedures. Results can be used to aid in future recruiting, advising, student and resident life programs, and first-year curriculum. Additionally, the results of this study will provide data useful to Marshall University and other peer institutions in determining what interventions would be most effective in increasing first-year persistence. Administrators should be able to use these results in developing policies and procedures as they relate to resource allocation, overall goals of the institution, and program development. This study also provided validation of Tinto's model of student departure and the predictability of MAP-Works within the context of Marshall University.

Delimitations and Limitations

This study was delimited to the 2009 Marshall University freshmen class who participated in the MAP-Works survey as part of their UNI 101 first year course.

The limitations of this study included the reliance on self-reported data that are subject to bias such as providing socially desirable answers and extraneous factors such as differential knowledge and understanding of research parameters.

CHAPTER TWO: LITERATURE REVIEW

Understanding why students choose to leave higher education before matriculating is the subject of much research that often focuses on attributes of a student and the resulting person-environment fit with an institution (Bean, 1980; Bean, 1983; Boyer, 2005; Kern, Fagley, & Miller, 1998; Pascarella & Terenzini, 2005; Pascarella & Terenzini, 1983). Limitations on research exist because many times it is unknown whether a student departs a specific institution or higher education altogether (Lau, 2003; Tinto, 1993). In other words, institutional persistence may not be representative of overall higher education persistence because many students may leave one institution for another or may take several years off only to return some time later to complete their education (Tinto, 1993).

Tinto (1993) states "From the perspective of the institution it can reasonably be argued that all students who withdraw can be classified as dropouts regardless of their reason for doing so" (p. 139). Tinto argues however that the term "dropout" implies a failure on the part of the student when this may not be the case. Institutional persistence rates can be somewhat misleading because not all students who depart an institution before matriculation leave higher education altogether (Tinto, 1993). Some students leave one institution for another or leave for a time period only to return at a later date and not all departures are avoidable even with institutional actions (Tinto, 1993). Universities need to understand their educational goals and understand that some students cannot meet these goals as no matter what interventions take place these students will not persist (Lau, 2003; Tinto, 1993). There are many reasons why students leave before matriculating and this issue has been the focus of research for more than 40 years.

Theorists such as Tinto and Bean proposed models of student persistence that are based on the psychological and social constructs of a student and the resulting interactions with an academic setting that determine compatibility between student and their environment (Bean, 1980, 1983; Tinto, 1993, 1998, 2006).

Person-Environment Fit

Person-environment fit theory describes how a person fits into a work place and takes into consideration motivation, ability, and productivity (Ganley, 2010). A person brings abilities to his or her work environment which provides both demands and rewards. As long as the fit between the person and the environment is strong, both the person and the environment benefit (Roberts & Robins, 2004). However, when an employee does not fit his or her work environment it can lead to stress that in turn leads to lower productivity and more stress (Caplan, 1987). Models of student persistence are based on the level of congruency between student and institution (Bean, 1983; Lau, 2003; Pascarella & Terenzini, 2005; Tinto, 1993). This congruency is measured either by psychological factors or academic and social integration. Feldman, Smart, and Ethington (1999) state that "…it is assumed that–other things being equal- that *congruence of person and environment* is related to higher levels of educational stability, satisfaction, and achievement" (p.643). Grounded in vocational behavior, person-environment fit is applicable to educational settings and is a plausible explanation for student persistence (Allen & Robbins, 2008). Personal fit theory as it related to educational settings has three components:

1. Students choose an institution that they perceive is compatible with their personalities.
2. Institutions reinforce different patterns of interests.
3. Students thrive when they are congruent with their environment (Feldman, Smart, & Ethington, 2004).

Feldman et al. (2004) found that students who are in an environment in which they have a high level of congruency are more likely to progress in their college career. Incongruence may not necessarily mean that students will not progress or persist but they may do so in a less than optimal manner. Students who are congruent with their educational environment are more likely to increase their skills and interests than students who are incongruent with their academic environment (Feldman et al., 1999). In a study to determine student-university fit, Gilbreath, Kim, and Nichols (2009) determined that there were three categories of fit; social, academic, and physical. As the needs of students were met in these categories, their psychological well-being and satisfaction increased. Following is an overview of two theories of student persistence: Bean's Model of Student Attrition and Tinto's Model of Student Departure which use person-environment fit as a theoretical basis.

Bean's Model of Student Attrition

Bean's model of student attrition is based on the workplace turnover research of Price and Mueller (Bean, 1983). The Price-Mueller causal model of turnover assumes that members who leave an organization do so for similar reasons and that job satisfaction influences the intent to stay. Organizational determinants of job satisfaction include repetitiveness of work, participation in job-related decisions, prior training, and

pay. Bean applies this model to institutions of higher education by creating surrogate categories between workplace and educational institutions. For example, pay in the workplace is measured in an educational institution by grades, practical value of the education, and personal development. Other variables used in the educational model are identical to workplace variables but are operationalized differently.

Bean's model of student attrition is divided into four categories:

1. Background variables which include past academic performance, socioeconomic status, hometown size, and distance to hometown,
2. Organizational determinants such as development as a student, integration with peers, and academic performance,
3. Intervening variables of satisfaction and institutional commitment, and
4. Dropout as the dependent variable (Bean, 1980).

The relationships between the categories and their individual determinants are additive so that the higher the number of determinants, the lower the likelihood of attrition. The model indicates a causal relationship between background variables and organizational determinants that directly influence the intervening variables of satisfaction and institutional commitment. According to Bean, institutional commitment is a measure of loyalty to membership of an organization such as a university. Student departure is lower when satisfaction and institutional commitment are high (Bean, 1980).

Research on student departure using this model shows that differences exist in departure explanations based on sex (Bean, 1980). Females are more likely to depart because of low institutional commitment and prior academic performance. For males, departure was related to institutional commitment, university GPA, and satisfaction with

the role of a student. For both sexes, institutional commitment was the most important variable with the perceived quality of education as the most important variable for determining institutional commitment and thus student attrition. Student beliefs or perceptions are an integral part of the model of student attrition because they are presumed to be affected by the experiences of the students and shape the intention to stay or leave the institution (Caberra, Nora, & Castaneda, 1993).

Tinto's Model of Student Departure

Tinto's longitudinal model of student departure is measure of the fit between a student and an institution (Pascarella & Terenzini, 1983). Interactions between students and their educational environment influence the fit or the congruency and the stronger the congruency, the more likely the student is to persist. The purpose of Tinto's model is not to describe why students voluntarily withdrawal but to explain how the interactions and experiences a student has influences the decision to depart. Tinto's purpose for this model is to aid institutions in developing and implementing interventions to ameliorate specific institutional-based attrition causes. This use of this model allows an institution to ask specific questions based on their own students and unique environments (Tinto, 1993; 1998).

According to Tinto's model, students enter college with certain pre-entry characteristics such as sex, ethnicity, family educational background, and high school performance measures such as SAT or ACT scores (Tinto, 1993). These characteristics may have been a factor in the choice of which college to attend and may influence students' motivation and the commitment to education and the institution. Once at the institution, students experience the academic and social system of the university. Both

systems are divided into formal and informal experiences. Formal academic experiences include academic performance and informal academic experiences are interactions with faculty and staff. Extracurricular activities make up the formal social system, and interactions with peers constitute the informal social system. A student's experiences within these two systems influences his or her academic and social integration (Tinto, 1993).

Academic integration includes the success of a student in terms of academic and intellectual development, the student's perception of faculty concern regarding quality of teaching and student development, and the frequency of non-class interactions with faculty (Pascarella & Terenzini, 1979; 1983). Social integration includes how involved a student is with extracurricular activities and the perceived quality of the support a student receives from peers and faculty (Pascarella & Terenzini, 1979; 1983). Tinto (1993) hypothesizes that interactions between social and academic integration may be compensatory so that low academic integration may be offset by high social integration or vice versa. As the term progresses, students reformulate their commitment to their education and the institution and make the decision either to persist or depart. Tinto's model is summarized in Figure 1.

Figure 1. Tinto's Longitudinal Model of Student Departure

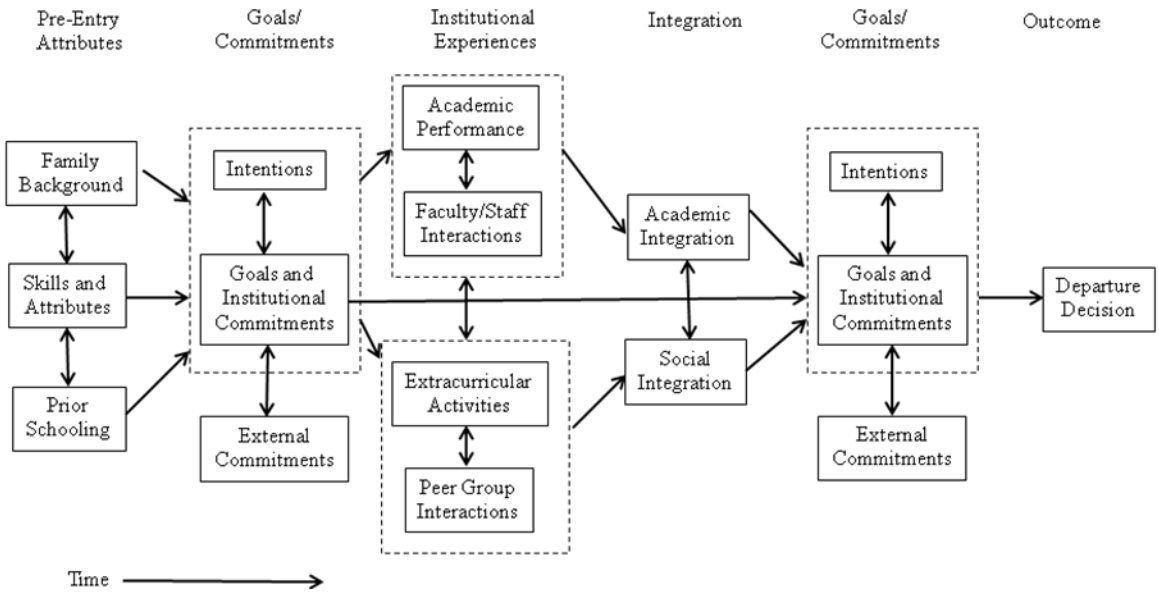

Figure 1. Tinto's longitudinal model of student departure (Tinto, 1993).

Tinto (1993) argues that students who depart are influenced by their situations more than by personal or institutional attributes. His model of departure cites the level of congruency between a student and a college or university. Over time, this congruency either develops or does not and eventually influences the decision to depart. Tinto stresses that even though the roots of departure are not based on individual attributes, these factors have indirect influences on the fit between the student and the institution and the resulting social and academic integration that is at the center of the Tinto departure model (Tinto, 1993).

Pascarella and Terenzini (1983) used path analytic validation of Tinto's student departure model finding that background characteristics such as race, sex, and aptitude did not explain variance in persistence nor did pre-college educational commitment. Their results further indicate that it is academic and social integration that accounted for 10.5 % to 12.2% of the variance. Nearly 5% to 7.6% of the variance was attributed to

goals and institutional commitments as measured after students had a chance to integrate. They suggest that as Tinto's model predicts, what happens to students after they arrive on campus rather than the student's background is more predictive of persistence. Although the background demographics of a student cannot be dismissed, it is not easy to assign a causal relationship between these characteristics and the decision to depart (Caberra, Nora, & Castaneda, 1993).

The path analysis of Tinto's model suggests that not all the longitudinal relationships exist at all institutions. Pascarella and Terenzini (1983) found in their study that initial goal commitments influence subsequent goals commitments and academic integration but did not influence social integration. Some measures of the model had both a direct and indirect effect on persistence. Their study shows that goal commitment influences academic integration and instructional commitment influences social integration, but neither of the commitment variables had a direct impact on persistence. The combined academic and social integration measure, as influenced by commitment variables, however, did directly affect persistence. Findings such as these are limited to one institution and although persistence models can be used in a generalized sense, individual institutions need to understand that persistence models cannot be applied without analysis of institutional specific data (Murtaugh, Burns, & Schuster, 1999, Pascarella and Terenzini, 1983; Tinto, 1993).

Persistence Factors

The causes of departure are complex and often difficult to isolate. Even if known, these characteristics may not be used in recruitment or admissions because many schools do not have a large enough applicant pool to be selective (Pascarella & Terenzini, 2005).

As a result, institutions need to understand the causes of departure and develop mitigation plans for those students who are most likely to depart (Pascarella & Terenzini, 2005). Kern, Fagley, and Miller (1998) state that "retention is viewed as a fundamental indicator of student success" (p. 1). Retention, or persistence, has been the focus of much research over the past 40 years with emphasis on pre-entry factors such as prior educational experience and performance, race, sex, and family educational background as well as the affective domain such as motivation, satisfaction, and self-efficacy (Pascarella & Terenzini, 2005).

Pre-entry Characteristics

Much of the literature on persistence focuses on the characteristics that a student possesses when he or she enters college (Boyer, 2005; Johnson, 2008; Kern, Fagley, & Miller, 1998; Mattson, 2007; Murtaugh, Burns, & Schuster, 1999; Pascarella & Terenzini, 1983; Tinto, 1993). These characteristics include sex, family educational background, and prior educational experience. Data are obtained through institutional databases and surveys and are used to characterize student attributes in relation to persistence (Murtaugh, Burns, & Schuster, 1999; Pascarella, Duby, Miller, & Rasher, 1981; Pascarella & Terenzini, 1983)

Sex. Murtaugh, Burns, and Schuster (1999) studied the predictive value of ten pre-entry characteristics at Oregon State University between 1991 and 1996 which included age at first enrollment, sex, ethnicity, residency, college at first enrollment, high school GPA, SAT scores, first quarter GPA, participation in educational opportunities program, and enrollment in freshmen orientation. Of the ten characteristics sex was the only variable that was not significantly related to persistence. Although a direct

relationship may not exist between sex and persistence, indirect effects did exist. Social integration appeared to be a stronger influence on female persistence than academic integration with the opposite true for males. Initial goal commitment was stronger for females than males. The female goal commitment measure had a direct influence on social integration and persistence and was the only pre-entry attribute that had an influence on persistence. Conversely, male persistence was directly related to academic integration and subsequent goal commitment and only indirectly through pre-entry attributes (Murtaugh, Burns, & Schuster, 1999). Other studies indicate that gender differences have an influence on first semester GPA which is positively correlated with persistence (Mattson, 2007).

Stratton, O'Toole, and Wetzel (2007) found that there is little difference in the persistence rate of males and females but as the age of matriculation increases, males are less likely to depart than females. Other studies however, indicate that sex does influence the educational experience differently for males and females. Females typically have greater first semester departure rates than males (Boyer, 2005). Other studies indicate sex differences are indirect through other factors. For example, both males and females have higher persistence rates when they participate in informal academic discussions with faculty but male persistence increases when informal interactions deal with career choices and female persistence increases when these interactions center on campus issues (Pascarella & Terenzini, 2001). These findings reinforce the findings of other researchers that academic integration is important for males and social integration is important for females and that sex by itself does not hold predicative value; instead, the way in which

males and females perceive and operate within their college environment influences persistence (Murtaugh, Burns, & Schuster, 1999).

Family Background. The educational background of a student's family influences the educational attainment of student (Choy, 2001; Collier & Morgan, 2008; Hertel, 2002; Pascarella, Pierson, Wolniak, & Terenzini, 2004). Students whose parents did not attend college are less likely to enroll in college and for those who do enroll, persistence and graduation rates are lower than non-first generation students (Choy, 2001). Ishitani (2003) reports that first-generation students are 71% more likely to depart than students with parents who are college educated. First-generation students are more likely than non-first generation students to be 24 years or older and those who matriculate at a younger age are more likely to come from low SES households (Choy, 2001). They are also more likely to work while enrolled, identifying themselves as employees who attend school rather than a student who works.

The transition to college is a stressful time in a student's life (Hertel, 2002). When the student is a first-generation college student, defined as a student who is the first in his or her family to attend college, this stress is often higher than that of non first-generation students (Hertel, 2002; Wang & Casteneda-Sound, 2008). First-generation students have less knowledge of college life, social and familial support, and fewer financial resources (Hertel, 2002). Often, they have lower academic self-efficacy which places them at risk of higher stress levels and lower persistence (Wang & Casteneda-Sound, 2008). Stratton, O'Toole, and Wetzel (2007) found that students were less likely to persist if their parents had a high school education or less. Parental financial status also played an important part in student departure rates. Students from households at or

below the poverty level were twice as likely to dropout as those students from more affluent households. Financial support as well psychological support for an education was a significant predictor of departure (Stratton, O'Toole, & Wetzel, 2007). Other research shows that first-generation students may not know how to navigate the collegiate systems or understand social cues or the college student role in the same way as their non first-generation peers (Collier & Morgan, 2008).

In a longitudinal study of first-generation students using the National Study of Student Learning, Pascarella, Pierson, Wolniak, and Terenzini (2004) found that first-generation students were less likely to attend highly selective schools, were less likely to live on campus, were more likely to work off campus, and completed significantly less credit hours. Pascarella et al. (2004) also found that first-generation students were less-likely to have an educational degree plan indicating a low-goal commitment that may lead to lower persistence. Jamelske (2009) found that first generation students were less-likely to return for a second year when compared to non-first generation students. Prospero and Vohra-Gupta's (2007) research indicates that there were no differences in motivation or integration between first-generation and non-first generation students. However, intrinsic motivation was more important to academic integration for first-generation students than non-first generation and this contributed more than any other variable studied for academic achievement. Prospero and Vohra-Gupta concluded that motivation and integration are important contributors for the success of first-generation students

Prior Educational Experience. The educational background of a student includes high school performance measures such as GPA and ACT/SAT scores and other

factors such as college preparatory curriculum offerings. Students with low high school GPA have higher departure rates (DeBerard, Spielmans, & Julka, 2004). Jamelske (2009) found for every one point increase in ACT, there was a 0.018 increase in college GPA. He also found that as high school rank increased 10%, college GPA increased by 0.22 points. Furthermore, students who matriculated with college credits added 0.151 to their college GPA (Jamelske, 2009). Prior educational experiences play a role in the initial commitment a student has toward their education and ultimately their academic and social integration and form the basis for models of persistence (Jamelske, 2009; Johnson, 2008; Murtaugh, Burns, & Schuster, 1999; Pascarella, Duby, Miller, & Rasher, 1981; Sanders & Burton, 1996).

Pre-entry factors such as ACT scores have a positive impact on persistence through academic performance as measured by first-year GPA (DeBerard, Spielmans, & Julka, 2004; Gifford, Briceno-Perriott, & Mianzo, 2006). However, in a study of a large public research university, Johnson (2008) found that high school GPA was not significantly related to persistence. Johnson's research indicates that the completion of college preparatory curricula increased the odds of persistence by 1.16 times. Students from high schools that were located within 60 miles of the university were 1.22 times more likely to persist than student who lived further away and students whose high schools had high percentages of free and reduced lunch were less likely to persist than their peers whose schools had low percentages of free and reduced lunch (Johnson, 2008). Johnson's (2008) research indicates that the highest percentage of students who were more likely to persist were from schools where 50-70% of the students took the SAT. Delayed college entrance also increases persistence as students who matriculated

immediately after high school were more likely to depart than those who delayed college entrance (Stratton, O'Toole, & Wetzel, 2007).

A meta-analysis of college persistence research by ACT shows that high school GPA is the most predictive of college persistence followed by socioeconomic status and then ACT assessment scores which were considered to be of moderate practical strength in determining persistence (Lotkowski, Robbins, & Noeth, 2004). Other factors such as academic-related skills (study skills, and habits), academic self-confidence, and academic goals, as reported in the first year of college, were measured as strong in terms of predicting persistence. When these factors were combined their predictive strength was considered to be much greater for both persistence and college GPA indicating that pre-entry characteristics alone may not provide the best predictions of persistence (Lotkowski, Robbins, & Noeth, 2004). Pascarella and Terenzini (1983) concur by stating that "the influence of student pre-enrollment characteristics…were indirect, their effects on persistence being largely mediated by the freshmen year experience" (p. 225).

Summary of Pre-entry Characteristics. Students are more likely to persist past their first year of college if they have high GPAs from high school, educated parents, and are academically and socially integrated. Sex may influence persistence but usually indirectly through other factors. Academic integration appears to be most predictive of male persistence and social integration is predictive of female persistence. Both sexes benefit from faculty interactions although the types of interactions are not the same for males and females. Prior educational experience such as ACT and high school GPA may also be positively correlated with persistence for most students but generalizations cannot always be made across institutions.

Affective Domains

Traditional college students are emerging into an adult life with new choices and experiences (Lau, 2003). College-age adults are allowed, perhaps for the first time, to choose their environmental influences (Wintre, et al., 2008). Gerdes and Mallinckrodt (1994) define three areas of adjustment to college life: academic adjustment, which includes academic skills and motivation, social adjustment, and personal adjustment. In their study at a large northwestern public university, first-year students were surveyed to determine their level of adaptation to college life. Academic and social adjustment were overestimated by students whereas personal adjustments were underestimated. As students may not be aware of their adjustment challenges, the authors conclude that all students, not just those who are academically challenged, may benefit from interventions to improve persistence.

In a meta-analysis of psychosocial and study skill factors and the predictive value on college outcomes, Robbins, et al. (2004) found that several affective characteristics were positively correlated with persistence. Academic self-efficacy, a measure of a student's evaluation of his or her academic success, was positively correlated with persistence and was only slightly less than the top predictor of academic-related skills. Other affective characteristics that were moderately correlated with persistence were social involvement, measured by how connected the student feels to the college environment and social support which is a perception of the support networks available. Robbins et al. suggest that psychosocial factors are more predictive of persistence than they are for GPA. In terms of predicting overall college outcomes of persistence and

GPA, the only factors in their analysis that were consistent predictors of both were those related to self-expectancy constructs such as achievement motivation.

According to Tinto (1993), expectations of one's education and motivational level to succeed are important factors influencing persistence. Motivation is a measure of goal commitment and may be operationalized in an academic context as the desire to finish college (Allen, 1999). Some universities are using locus of control metrics to measure the potential motivation factors that influence both student choices as they relate to engagement and academic success that lead to successful college completion (Gifford, Briceno-Perriott, & Mianzo, 2006). Locus of control is classified as internal or external with the former as to accepting responsibility for one's actions and outcomes and the latter blame others or outside forces (Gifford, Briceno-Perriott, & Mianzo, 2006). In their study of a large public university, Gifford, Briceno-Perriott, & Mianzo found that students with internal loci of control had higher GPAs than students with external locus of control. Students with internal loci of control were also more likely to return for their sophomore year.

In a study designed to validate the Student-University Match questionnaire which was designed to predict attrition based on psychometric properties, 28% of students who left after their first year attributed their leaving to incongruence with the school's environment (Wintre, et al., 2008). Academic achievement, attachment to the university, and social integration scores were essentially the same for persisters and departers. Overall, departers had lower Student-University Match scores than persisters indicating that students who are satisfied with their educational experience including academic and

social aspects are more likely to have a higher congruency with the institution and thus persist (Wintre, et al., 2008).

Academic satisfaction is the key predictor of overall satisfaction followed by social life satisfaction (Sanders & Burton, 1996). Following Tinto's retention model, satisfaction with academic and social aspects of an institution leads to integration and increases persistence. Satisfaction with the educational experience can be measured by student engagement. Studies show that student engagement, the amount of time and energy a student puts toward activities that enhance their education is positively linked to persistence (Pascarella & Terenzini, 2005; Tinto 2006). Student engagement can be further defined as those activities that lead to academic and social integration, an integral part of persistence models.

Using the National Survey of Student Engagement (NSSE), Kuh, Cruce, Shoup, Kinzie, and Gonyea (2008) studied the effects of student engagement on first-year grades and persistence. Although precollegiate factors accounted for 29% of the variance in first-year grades, adding student engagement to the model increased the variance for first-year grades to 42% (a 13% increase). Once student engagement variables were added to the analysis, the effects of precollegiate factors were decreased in magnitude and parental educational levels became negligible. Compensatory effects of student engagement were also noted as students with lower pre-entry academic performance indicators benefitted more in terms of academic achievement than those students with high ACT scores or other pre-entry indicators of academic background. The authors conclude that "*who students are when they start college*…is associated to a non-trivial degree with what they do in the first year of college" (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008, p. 546).

Models of persistence, Tinto's model of student departure in particular, emphasize the importance of student involvement in the persistence process. Even though Tinto's model is based on the perception of students and their behaviors as they progress through their academic environment, little research attention has been focused on what specific behaviors are predictive of academic and social integration and thus persistence (Berger & Milem, 1999). Berger and Milem assert that there is a cycle of student perception and behavior that is driven by the level of involvement on campus. Behaviors that promote positive campus involvement, academic and/or social, lead to a positive perception of the educational experience and ultimately, as Tinto's model predicts, increased persistence.

First-year students at the University of Kentucky were surveyed to determine if dispositional and academic optimism and motivation were positively related to persistence (Solberg, Evans, & Sergerstrom, 2009). Both types of motivation were positively correlated with performance as measured by GPA. The more optimistic a student is, the better the academic performance. Motivation was positively related to both dispositional and academic optimism and thus GPA. Overall, this research found that students who are generally and academically optimistic and who are motivated and experience little distress are more likely to persist and have positive academic outcomes.

Students attend college for different reasons and according to Stage (1989), these reasons can be divided into motivational categories. In her study, the following three were the most common:

1. Cognitive subgroup who attend college for academic reasons such as the desire to gain knowledge,

2. Certification subgroup who attend college for practical reasons such as to earn a degree or to get a job,
3. Community service subgroup who attend college to learn skills to enable them to help others.

Each of these motivational subgroups exhibit distinct persistence patterns. Students who were motivated to go to school for the sake of learning (Cognitive) were the most divergent from Tinto's model of student departure. Students in this group were more likely to depart even though they were academically integrated. For the Certification group, a one unit change in academic integration increased their odds of persisting by 1.86 but a one unit change in institutional commitment increased the probability of persisting by 21.42 (Stage, 1989). Academic integration was the least influential factor for persistence of the Community subgroup but social integration, especially for males was the most influential. These results indicate that the affective characteristics of a student may greatly influence the applicability of Tinto's model in predicting the persistence of college students.

Summary of Affective Domains. Some research indicates that affective characteristics may be more predictive of persistence then prior educational experience, family background, or academic achievements. Students are more likely to persist if they have high academic self-efficacy and possess an internal loci of control. Social support, as well as social involvement and engagement are important persistence factors that lead to higher satisfaction and persistence. Finally, students who are optimistic have higher academic motivation and persistence.

Enrollment Profile

Enrollment intensity or load has an impact on persistence. As defined in Stratton, O'Toole, & Wetzel (2007), enrollment intensity may be thought of as an indicator of behavior that relates to persistence factors. It may also be a result of cost-benefit analysis on the part of a student. Stratton et al. (2007) also indicate that enrollment intensity may be related to institutional characteristics as some universities foster part-time programs while others are not as amenable to part-time status especially for those who are employed. Within any construct, part-time students are less likely to persist than full-time students (Boyer, 2005; Stratton, O'Toole, & Wetzel, 2007). Economic changes, such as those in the job market and personal changes such as marital or parental status affect the persistence of part-time students differently than full-time students. Grades earned also have a differential effect on part-time students as compared to full-time students. Part-time students may not view first-year grades as valuable for graduation because their lower academic load lowers the probability of graduation within a particular time frame (Stratton, O'Toole, & Wetzel, 2007). Overall however, part-time status is a risk factor in attrition with nearly a three-fold increase in the dropout rate of part-time students as compared to full-time students (Stratton, O'Toole, & Wetzel, 2007).

The academic load of a full-time student varies and may also be a factor in persistence. Research on students at Stephen F. Austin State University indicates that the higher the academic credit load, the higher the GPA and the higher the persistence regardless of academic major (Szafran, 2001). These results also apply to students who took developmental courses as a condition of their enrollment. Students were also more likely to return for a second year if they were enrolled in difficult courses and earned a

high GPA in their first year. Szafran (2001) found that the more difficult the course load, the higher the GPA and this had a positive direct effect on persistence whereas prior educational experience did not have an effect on academic load or success. Students with high course loads have to manage time and view education as high priority (Szafran, 2001).

Choice of academic major has been shown to be correlated with persistence. Students who are satisfied with their academic major, as measured by fulfilled expectations of the program are more likely to persist with no differences among males or females (Cor, Suhre, Jansen, & Harskamp, 2007). St. John, Hu, Simmons, Carter & Weber (2004) found that students majoring in social sciences or who were undecided in their program of study were less likely to persist as those in what they consider to be high demand and high income potential major fields such as business, health, and engineering. St. John, et al. hypothesize that lower persistence rates for students who were undecided in their major may be a result of low goal or institutional commitment as well as low academic and social integration. Satisfaction with a degree program is also associated with higher subsequent enrollment intensity and grades (Cor, Suhre, Jansen, & Harskamp, 2007).

Summary of Enrollment Profile. Enrollment intensity is positively associated with persistence with full-time students and those taking higher course loads experiencing lower attrition. Part-time students are affected by common persistence risk factors such as grades and economics differently than full-time students. Degree satisfaction is associated with higher persistence through higher grades and enrollment

intensity. Finally, certain degree programs appear to be correlated with increased persistence especially those that lead to highly valued and high income professions.

Academic Performance

The outward measure of academic success is reported as first-year GPA which offers a tangible and comparable assessment. Students who are academically successful are more likely to persist and as a result, GPA is a focus of persistence research (Szafran, 2001). In Johnson's (2008) study, first semester GPA has the greatest impact on persistence. A one point increase in first-year GPA increases the odds of persistence by three times (Johnson). The model presented in this research also indicates that high school GPA and SAT scores were not significantly correlated with persistence when college GPA was added to the model. Gender differences are evident as females are less likely to depart due to academic circumstances than males. Johnson (2008) also found that college GPA was positively associated with graduation and thus persistence. Several other studies indicate that first-year GPA is correlated with persistence (Kern, Fagley, & Miller, 1998; St. John, Hu, Simmons, Carter, & Weber, 2004; Szafran, 2001). Students with below C average GPAs are less likely to persist (St.John, Hu, Simmons, Carter, & Weber, 2004). High GPAs are also correlated with departure indicating students may not feel academically challenged and may choose to transfer to another institution (St. John, Hu, Simmons, Carter, & Weber, 2004).

Motivation to learn has a positive impact on GPA which has been shown to be positively correlated with persistence. Kern, Fagley, & Miller (1998) found that motivation has an indirect relationship to attrition through a direct relationship to GPA. Motivation in this study was influenced by the effectiveness of a student's time

management skills, the effective use of test-taking strategies, and the ability to concentrate. Kern, Fagley, & Miller (1998) suggest that because students can be taught to effectively manage time and use test-taking strategies, such interventions could ameliorate student departure. The authors of this study note that this in an important finding because traditional learning support services for at-risk students often involves enhancing basic study skills when increasing motivation may be more appropriate.

DeBerard, Spielmans, & Julka (2004) found that of 10 potential predictors of academic performance and persistence, nine of the 10 were correlated with first year GPA accounting for 56% of the variance in academic performance but only one was correlated with persistence. These predictors included affective and behavioral attributes. The results also show that first year GPA is more predictive of persistence than high school GPA or SAT scores. The authors conclude that because only one predictor out of 10 was positively correlated with persistence, persistence is not easy to predict but in general low first year GPA is negatively associated with persistence (DeBerard, Spielmans, & Julka, 2004).

Summary of Academic Performance. First-year GPA is positively associated with persistence. Generally, the higher the first-year GPA, the greater the probability of persistence and graduation. Gender differences are evident in this association with the GPA exhibiting greater impact on the persistence on males than females. This finding is supported by other research on gender differences in academic and social integration. Motivation affects persistence through GPA and is often an indication of the ability of student to manage time and use effective test-taking strategies.

Institutional Actions

Not all students who enter college will persist past the first year or persist to graduation. With persistence and graduation rates decreasing, institutions of higher education are faced with the task of retaining students and ensuring they graduate. The question becomes one of perspective; should universities expect students to adapt to the institution or should changes in institutional culture be implemented to answer to student needs in order to increase persistence (Longden, 2006). With a decline in applicant pools, greater competition for students due to economic circumstances, and a decrease in many admission budgets, universities are often unable to select students who will be an easy fit to the university; instead, the institutional climate is often altered or marketed to meet the needs of interested students (Holley & Harris, 2010). In order to meet the needs of students and to increase student satisfaction, universities often implement initiatives designed to create environments that promote academic and social integration (Jamelske, 2009). These include first-year programs such as learning communities, classroom enrollment and management strategies that optimize learning experiences, and student advising that goes beyond course scheduling (Lau, 2003).

First-Year Programs. Pascarella and Terenzini (2005) report that 95% of four-year institutions in the United States have some form of first-year programs. Whether a first year seminar, set of courses, or living learning communities, the goal of these programs is to extend freshmen orientation, increase first-year academic performance and aid in the transition to college (Jamelske, 2009; Lau, 2003; Murtaugh, Burns, & Schuster, 1999). The curriculum often includes navigating the college's academic and social programs and is intended to increase student integration in both these areas and thus

persistence (Jamelske, 2009; Pascarella & Terenzini, 2005). Barefoot (2000) lists the following objectives for first-year programs:

1. ncrease student-to-student interaction,
2. Increase student-faculty interaction outside of class,
3. Increase student involvement,
4. Link curriculum and co-curriculum,
5. Increase academic expectations and engagement,
6. Provide assistance for students with insufficient academic preparation.

Pascarella and Terenzini (2005) found that persistence into the sophomore year and graduation rates are higher among first-year seminar participants. Data suggest that participation in first-year programs provides numerous interactions with faculty and peers leading to positive perceptions of the ability to learn and increase in overall student satisfaction through both academic and social integration (Starke & Sirianni, 2001; Zhao & Kuh, 2004). Benefits from first-year experiences are experienced by all types of students including both males and females, minorities and non-minorities, traditional and non-traditional students, residents and commuters, and academically prepared and at-risk students (Goodman & Pascarella, 2006).

First-year programs may have a significant positive impact on GPA (Jamelske, 2009). In a study of a large Midwestern public college, students who enrolled in a first-year program had a 0.122 higher GPA than students who did not (Jamelske, 2009). However, first-year programs do not necessarily increase student academic achievement as measured by first-year GPA. Zhao and Kuh (2004) found that first-year GPA was significantly lower for students who voluntarily participated in first-year programs

compared to students who did not. The students who participated in these programs had lower SAT/ACT scores and by the time they were seniors, there was no significant difference in their GPAs as compared to those students who were not part of learning communities in their first year. Students who may have been at-risk of attrition because of low pre-entry educational measures benefitted from first-year programs and were more likely to matriculate (Zhao & Kuh, 2004). Jamelske's (2009) research supports this. In his study, below average males who were not enrolled in a first-year experience had a retention rate of 69.4% but when enrolled in a first year experience, their retention rate increased by 6.1%. Below average females had a retention rate increase of 7.7% if enrolled in a first year experience (Jamelske, 2009).

First-year programs vary from institution to institution but generally, the intent is to provide a transition from high school to college, enhance academic skills needed for success, engage students academically and socially, and provide opportunities for learning communities (Jamelske, 2009). Porter and Swing (2006) derived five common learning outcome measures in a cross-institutional study of first-year programs. These included study skills/academic achievement, campus policies, campus engagement, peer connections, and health education. Of these five, only study skills/academic achievement and health education had a significant impact on early intent to persist. These data were derived using student perceptions of how valuable each of the common outcomes were to their academic success. Health education was an important aspect of first-year programs may be related to a feeling of well-being which translates to increased motivation and self-esteem that are related to persistence (Porter & Swing, 2006).

Classroom Enrollment and Management. Student satisfaction, as it relates to persistence is influenced by classroom experiences. Classroom experiences in the first year are often introductory education classes. Many times, these classes are large with more than 100 students (Cuseo, 2007). These courses are often general education courses that are the foundational courses of major fields of study. With the average high school enrollment of 752 in 2000 (United States Department of Education, 2001), first-year students may see large classes as impersonal leading to feelings of anonymity. Many universities measure student satisfaction with academic experiences through course evaluations or ratings. Students are less likely to persist when enrolled in courses that consistently receive low ratings (Langbein & Snider, 1999).

Class size is often associated with particular classroom management. Large classes tend to rely on lectures, provide few opportunities for active learning, and reduce faculty-student interaction (Cuseo, 2007). Students are typically assessed through multiple choice tests and are not required to do a large amount of writing (Johnson, 2009). Attendance is less likely to be taken in large classes which may negatively affect student attendance (Johnson, 2009). Large classes are less amenable to student-centered activities that reduce the likelihood of student participation and increase the use of lecture formats (Cuseo, 2007). When students are given the opportunity to interact in classes, which occurs more often in small classes, they are more likely to undergo higher order learning such as synthesis and analysis which increases academic achievement and student satisfaction (Cuseo, 2007). Students report lower satisfaction with large-sized classes. Cueso (2007) recommends that first-year students be advised to take a seminar-

sized class (15 students) in conjunction with the large general education courses to allow first-year students the experience of a small class and the associated pedagogy.

In a study of class size and student performance Johnson (2009) considered the effects of class size on student grades. Her research indicates that large class size has a negative impact on obtaining high grades. For example, in pure hard-life courses, the probability of earning an A in a class of two was 0.85 and 0.11 in a class of 100 whereas the odds of earning a C were 0.99 in a class of two and 0.92 in a class of 100. She hypothesizes that large classes rely on behavioral learning strategies whereas smaller classes, in which the odds of earning a high grade were higher, rely on constructivist learning strategies. This study also supports other research that finds once a class reaches 50 students the effects of a large class size on student success and GPA do not continue to increase with an increase in class size. Because college GPA has been shown to be positively associated with persistence, class size indirectly affects persistence.

Advising. One of the most important aspects of the student-faculty relationship is that of advising (Lau, 2003). Advising not only includes course scheduling but also career counseling, mentoring, and identification of at-risk students (Campbell & Campbell, 2007; Lau, 2003). It also promotes the integration of student goals and institutional resources which increases student satisfaction and involvement (Metzner, 1989). According to Light (2001), students indicate that advising "may be the single most underestimated characteristic of a successful college experience" (p. 4). However, advising is often one of the lowest rated services on student satisfaction surveys (Steingass & Sykes, 2008). As diversity on campuses increases including the number of first-generation students, advising becomes more important to student success. Metzner

asked students at a large public Midwestern university to rate their advising experiences and found that students who perceived their advising as "good" were less likely to depart, had a higher GPA, were more satisfied as students, and perceived their education was valuable.

In a study of a formal faculty-student mentoring program at a large metropolitan university in California, students who were mentored by faculty had completed 7.7 more units of course credit than students who were not mentored (Campbell & Campbell, 2007). The first-year GPA of mentored students was 0.16 points higher than non-mentored students and departure rates of mentored students were almost 12% lower than for non-mentored students. Campbell and Campbell also found that the graduation rate of mentored students was approximately 6% higher than non-mentored students. Although graduation rates were not statistically significant, the number of mentored students who entered graduate programs was significantly higher than those of non-mentored students with a significant portion of the mentored students entering post baccalaureate teaching credential programs (Campbell & Campbell, 2007).

For some students, academic advising is the only contact with faculty outside of class (Steingass & Sykes, 2008). Students who meet with their advisors at least twice per semester are more likely to have positive academic success and to persist than students who meet less frequently with advisors (Steingass & Sykes, 2008). A trend in advising is to provide centralized advising that coordinates advisors and core curriculum faculty. In a study at the Virginia Commonwealth University, student satisfaction with academic advising increased with centralized advising and more students were able to make educational plans indicating that educational commitment and goals, an integral part of

student persistence increased (Steingass & Sykes, 2008). Other positive aspects of centralized advising included increased student engagement, higher academic performance, and increased persistence.

Intrusive advising is an initiative on some college campuses that takes a proactive role in retaining students who are at-risk (Smith, 2007). Proactively reaching out to students who have been identified as at-risk for academic failure has been associated with positive academic outcomes for these students which can lead to increased persistence. In a study of intrusive advising at a two-year college, Smith (2007) found that students who were identified as at-risk were those who were uninvolved on campus, were inadequately academically prepared, and were not meeting the expectations for studying outside of class. Students who were identified however, rated themselves as involved on campus and were motivated to learn. Some students were not receptive to the services provided to them to ameliorate their challenges but this study identifies the advantages to intrusive advising. Faculty were able to identify challenges that were unique to each student and provide interventions.

Summary of Institutional Actions. Institutional actions influence the culture of the university and this culture impacts persistence through the ability and willingness of students to academically and socially integrate. Persistence begins at the admission process in finding the students who have the best chance at congruency with the university. First-year experiences increase persistence through increased contact with faculty and campus involvement and are associated with increased persistence and graduation rates. Class size can affect student learning and satisfaction and may be negatively associated with persistence. Advising is an integral part of student persistence

and affords students contact with faculty. Advising that increases persistence includes course scheduling, identification and implementation of individual challenges, and career counseling.

Early Alert Programs

Universities may use early alert programs or systems to identify students who may be at risk for dropping out of college before matriculation. These pro-active programs may be in-house and consist of referrals of students who are failing or not attending classes, are not socially adjusting, or experiencing personal problems (Cuseo, n.d.). Many times, these referrals are sent to a central location where the appropriate action is taken to counsel the student or implement interventions aimed at reducing the risk of academic failure or attrition (Cuseo, n.d.).

Several commercially available programs use student academic records, referrals from faculty, and student surveys to characterize students and their attrition risk. Based on student persistence theory, these programs enable a university to identify at-risk students and provide faculty and administrators tools to communicate with students and implement programs for student success (Giordana, 2006). These include Student Tracking Early Alert Retention System (STEAR), Student Early Alert System (SEAS©), Noel-Levitz, Inc.'s, Retention Management System *Plus*™, and Educational Benchmarking, Inc.'s, Making Achievement Possible-Works® (MAP-Works) each of which are designed to increase persistence efforts (Educational Benchmarking, Inc., 2010a;Giordano, 2006; Noel-Levitz, 2011; STEAR-Retention, 2010).

Similar in goals, each of these programs uses slightly different approaches to help universities increase persistence. STEAR Retention uses a university's existing programs

to create a retention plan tailored for an individual institution (STEAR-Retention, 2010). Once students are identified as at-risk through referrals or student data, STEAR prepares individual student action plans. SEAS uses student data to identify at-risk students and reports and tracks the interventions such as advising contacts and student services activities (Giordano, 2006). Noel-Levitz, Inc. uses their College Student Inventory to measure strengths and weaknesses for each individual student (Noel-Levitz, 2011). Using data collected from the student inventories as well as student academic records, the Retention Management System *Plus* can predict a retention risk for the student population and allow institutions to create persistence plans. Educational Benchmarking Incorporated's (EBI) Making Achievement Possible Works (MAP-Works) uses student surveys and academic data to create an institutional level overview of at-risk students and provides communication of risk to academic advisors and other stakeholders such as athletic coaches, student life, and administrators (Educational Benchmarking, Inc., 2010a).

MAP-Works is based on student development and learning theories research and identifies students who may be at risk of not returning for the next term (Educational Benchmarking, Inc., 2010a). Freshmen are surveyed in the third week of the first semester through the *MAP-Works Transition Survey*. This survey asks students questions that characterize their academic and affective attributes. It also analyzes their commitment to the institution, courses, and overall education. Academic areas include assessing study skills, time management, and a rating of the quality of courses and instruction. Student development or the affective characteristics include self-efficacy, self-motivation, residential life, and peer interactions. The results of *The MAP-Works*

Transition Survey, including an individual risk indicator as low (green status), medium (yellow status), or high (red status), are provided to the student, advisors, and other pertinent parties such as residential and student life or athletic coaches. The results of the survey allow administrators and advisors to plan intervention and support for an individual or cohort and allow the students to see what areas may put their success in college at risk. A *Map-Works Check-up Survey* is given to students in the second semester of the first year. The check-up survey is a shortened version of the transition survey. Academic and affective attributes of the students are updated after students have completely one semester of college. The check-up survey assesses the students' satisfaction with the institution and their education through their perceptions of their academic and social experiences.

Several colleges and universities report higher persistence rates and student academic success with the implementation of MAP-Works. Casper College reports a 39% higher fall-to-spring persistence rate and a 6% higher fall term completion rate since the implementation of MAP-Works. Higher student GPAs and higher completion of attempted hours were also reported as a result of the use of MAP-Works (Educational Benchmarking, Inc., 2011). Iowa State University reported similar increases in GPA and statistically significantly higher GPAs for students who viewed their student reports (Educational Benchmarking, Inc., 2011). Universities also report increased annual retention revenue with the implementation of MAP-Works. Hastings College reports a $1,000,000 gain over four year, Ball State $634,996 over three years, University of Illinois at Chicago's College of Business Administration projects a four-year gain of

$1,006,000, and Slippery Rock University projects a four-year gain of $2,568,552 (Educational Benchmarking, Inc., 2011).

Summary

In today's higher education climate, persistence is an important issue. The term "persistence" as viewed from the student's point of view is a measure of student success that leads to a desired outcome, most notably graduation. A review of the literature of first-year persistence reveals that persistence is a complicated issue synergistically influenced by many variables. Models of persistence are based on the level of fit or congruency between a student and the institution. This fit is influenced by several factors such as student background, academic programs, student life, and other institutional characteristics such as location. Tinto's (1993) model of student departure explains the longitudinal process that students go through as they enter and experience college. The literature generally supports Tinto's model but makes it clear that not all students or institutions fit perfectly into the model.

Placing students at the center of the persistence process by characterizing their backgrounds allows researchers to identify what specific characteristics have important influences on persistence for specific types of students or specific institutions. Pre-entry characteristics are fixed with each student and help to determine the fit to the institution. The experiences a student has once on campus are more predictive of persistence than the pre-entry characteristics (Pascarella & Terenzini, 1983; Tinto, 1993). These experiences are influenced by the institutional culture and are amenable to interventions.

Entering college is an important time in a college student's life. The ability of a student to adjust to this new environment may be related to several affective domains

such as motivation, locus of control, and satisfaction. Students' perceptions of their collegiate experiences, both academic and social are important factors in their decision to persist. Even when students attend college for different reasons, career choices, the pursuit of knowledge, or more altruistic reasons, persistence patterns reveal that students need to be engaged and involved.

The most successful students, in terms of persistence, are those who have are academically prepared as evidenced by high school GPA and ACT scores, and who have a successful first-year academic experience. Choice of major may influence this success as it relates to motivation and perceived important of academic outcomes. Enrollment intensity is an important influence on persistence. Generally, the higher the course load, the higher the GPA and thus persistence, regardless of academic preparedness upon entry to college.

Finally, the culture created by the institution through institutional actions is important in the process of persistence. A review of the literature indicates that first-year experiences such as freshmen seminars have a positive impact on persistence and academic success. First-year programs encourage students to interact with each other and with faculty increasing academic and social integration. Other aspects of institutional culture such as large class sizes may be detrimental to persistence by reducing student satisfaction and learning. Advising is considered to be one of the most important tools for persistence (Lau, 2003; Light, 2001). Pro-active early alert systems can aid universities in identifying at-risk students and provide tools to increase persistence and increase retention revenue.

CHAPTER THREE: RESEARCH METHODS

The purpose of this study was to determine what factors may affect first-year persistence of Marshall University freshmen. This determination was accomplished by characterizing students who persisted to their sophomore year (Fall 2010) and those who departed and did not return for their sophomore year of college (Fall 2010). This chapter describes the population, instrumentation, data collection and statistical analysis.

Design

This descriptive research was a case study to determine what factors influence persistence or departure in the 2009 Marshall University freshmen class. Descriptive research is used to examine the current status of a situation (Key, 1997). Case studies focus on the dynamics of a single setting and can be used to describe a situation, test theories, or generate theories (Eisenhardt, 1989). The relationship of the independent variables (pre-entry characteristics, student satisfaction, enrollment profile, and academic performance) to the dependent variable (persistence) was measured by the responses on the MAP-works *Transition* and *Check- Up surveys* and enrollment and academic performance data from Marshall University's academic management program BANNER.

According to Tinto (1993) "it remains for each institution to discern for itself the particular events which shape student departure from its campus" (p. 6). Astin (1970) stated over 40 years ago that the principle concern of research on the impact of college on a student is to assess the relationships between the student inputs, the college environments, and the student outputs. Astin's ideas in 1970 are still relevant in today's research. In order to evaluate the factors or group of factors that have an impact on the decision to persist or depart, variables related to those in Tinto's model of student

departure were used to evaluate the differences in persisters and departers of the 2009 Marshall University freshmen cohort. These data were used to predict factors that influence persistence in freshmen at Marshall University.

Population and Sample

The population of this study consisted of freshmen at Marshall University in Huntington, West Virginia who were admitted and enrolled in the 2009 freshmen class at Marshall University (n=1,958). The population included all students who were enrolled in UNI 101 course in the Fall of 2009. Consistent with the literature, a student was considered a persister if they returned for the 2010 fall semester and departers were those students who did not return for the Fall 2010 semester (Leppel, 2005; Tinto, 1993).

The population for this study included the 1,958 freshmen enrolled in the Fall 2009 semester. Of this population, 1,340 students completed the *MAP-Works Transition* survey, 362 students completed the *MAP-Works Checkup* survey in November, 281 students completed the *MAP-Works Checkup* survey in February, and 176 students took both check-up surveys. Students were included in the data analysis if they took the *MAP-Works Transition* survey and one of the *MAP-Works Check-up* surveys. For those students who took two *MAP-Works Check-up* surveys, the February check-up data was used. Using these criteria, a sample of 467 students were included in this study (n=467). The sample used in the data analysis represents 23.8% of the total 2009 freshmen population.

Data Sources

Data analyzed in this case study were extant and were collected from three MAP-Works surveys administered in the Fall 2009 and Spring 2010 semesters and existing student academic data for the Fall 2009 freshmen class obtained from Marshall University's enrollment management system BANNER. The data source for research question one was the MAP-Works Transition survey and the data source for research question two was the two MAP-Works Check-up surveys (Appendix A). The student academic data source for research questions one, two, three and four was from BANNER (Appendix B). Individual student data were deidentified and no keycode was available to the researcher. The deidentified student survey answers and enrollment and academic data were merged into one data set for analysis in Statistical Package for the Social Sciences 19.0 (SPSS) for statistical analysis.

Instrumentation

The two surveys that provided data to be used in this study included the *MAP-Works Transition* survey, administered during the UNI 101 courses in September and October of 2009 (n=1,340) and two identical *MAP-Works Check-up* surveys, given in November of 2009 (n=414) and February 2010 (n=316). The survey results were collected using self-reported questionnaires and were administered through the MAP-Works website. Self-reported data have been shown to be accurate in predicting retention among college students (Anderson-Rowland, 1997).

The instruments that were used to collect data were Educational Benchmarking, Incorporated's MAP-Works *Transition* and *Check-up Surveys*. The research questions were developed to align with the survey items and the current literature on student

persistence including Tinto's model of student departure. Educational Benchmarking, Incorporated, the developer of MAP-Works, validated MAP-Works in 2009 in 47 institutions (Educational Benchmarking, Incorporated, 2010b). Seventeen of the institutions provided persistence and grade point averages (GPA) for their fall cohorts. Results from these 17 institutions indicate that MAP-Works accurately predicted fall to spring term persistence as based on the assigned risk factor. Low-risk students had a fall-to-spring persistence rate of 98.8% and medium - risk students returned at a rate of 97.1%. High-risk students were almost 25% less likely to return for the spring semester (73.5%). Students who had previously been identified as low-or medium-risk and who at the check-up survey were identified as high risk only had an 83.1% to 85.7 % persistence rate to spring semester. Conversely, a student whose at - risk indicator changed from high to low or medium returned for spring semester at a rate of 97.7 % to 95.7%. These data provide support for the usefulness of this program in predicting first-year retention. Both surveys contained questions that provide information on the first two research questions described in Chapter 1. The two instruments are discussed in detail in the following sections.

Transition Survey

The *MAP-Works Transition Survey* was comprised of 154 questions grouped into 23 sections. The *Transition Survey* responses will be used to address Research Question one and align with Tinto's model of student departure as shown in Figure 2. The Student Characteristic section addressed demographic, family background, and prior educational experiences and the Financial Means section asked respondents to characterize their

current financial status. These sections relate to the pre-entry characteristics as described in Tinto's model of student departure (Tinto, 1993).

The remaining 21 sections of the *Transition Survey* related to the affective domains, including variables such as motivation and academic self-efficacy. Educational and institutional commitment variables were addressed in the Academic Goals and Commitment sections. Respondents were also asked to self-assess their academic abilities including writing, reading, and math skills and their ability to manage time and create and implement study plans in the Self-Assessment of Academic Skills and Management Skills sections. The rating of stress and healthy lifestyle which included sleep and exercise patterns were assessed in Stressors and Self-Assessment of a Healthy Lifestyle sections. Academic Experiences, Class Attendance, Academic Self-Efficacy, Basic Academic, and Advanced Academic sections asked students to assess their initial commitment and performance in courses, rate their study habits, and predict their academic success. Initial social interactions were evaluated in the Campus Involvement and Peer Connections sections and the degree to which residence status and its effects on social and academic involvement were assessed in the Current Residence, Academic Adjustment, and Sense of Belonging. Finally, the last section, Overall Evaluation of the College/University asked students if they would recommend this institution to others and if they would choose to come to this university if they had to do it over. These sections relate to the initial goals and commitments section (prior to institutional experiences) of Tinto's model of student departure (Tinto, 1993).

Internal consistency of the *MAP-Works Transition* survey was determined using Cronbach's alpha coefficient during data analysis. Internal consistency was analyzed for the whole instrument as a whole and for each of the instrument's sections.

Check-Up Survey

The *Check-Up Survey* had six sections and a total of 30 questions. The responses to this survey were used to answer Research Question two and align with Tinto's model of student departure as shown in Figure 2. This survey included questions intended to assess academic and social integration. Students were asked in the Academic Performance and Academic Integration sections to predict their term grades, their ability to succeed in what they perceive as their hardest course, and to rate their study habits. The Social Integration and Financial Means sections asked students to evaluate the degree to which they are involved in student activities, their satisfaction with their financial and living situations, and status of peer relationships. Finally, the Commitment, Overall Adjustment, and Overall Evaluation of the College/University sections asked students to what degree they planned to return for a second term and whether they would recommend the institution to others. The questions in this survey align with the integration and subsequent goals and commitment section of Tinto's model of student departure (Tinto, 1993).

Figure 2. Alignment of Research Questions and Data Sources with Tinto's Model of Student Departure

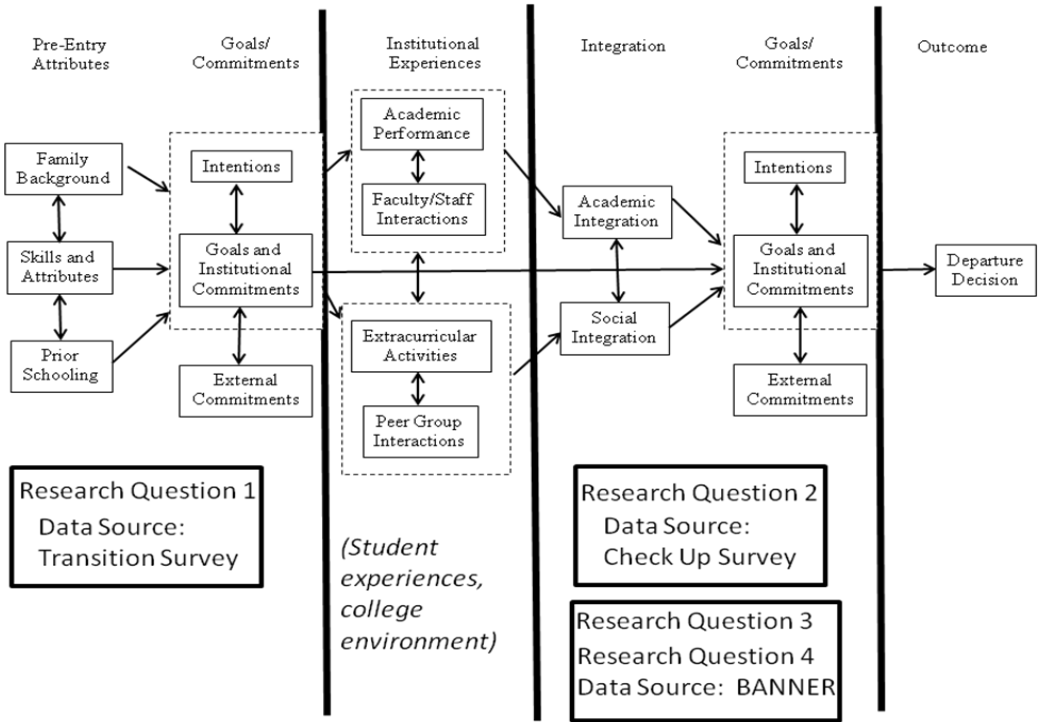

Figure 2. Alignment of Tinto's Model of Student Departure with Research Questions and Data Sources (adapted from Tinto, 1993).

Internal consistency of the *MAP-Works Check-up* survey was determined using Cronbach's alpha coefficient during data analysis. Internal consistency was analyzed for the whole instrument as a whole and for each of the instrument's sections.

Data Analysis

Each of the identified independent variables (sex, first semester GPA, goal commitment, etc.) was analyzed to determine if any have significant influence on the binary dependent variable of persistence. Logistical regression was used to determine the probability that each independent variable will result in the persistence or departure of student.

Summary

The research methods in this chapter were designed to determine what factors may affect first-year persistence of the 2009 Marshall University freshmen class. Extant data from the MAP-Works *Transition* and *Check-up* Surveys and BANNER was used to characterize students who persisted to their sophomore year and those who departed. Logistical regression was used to determine which independent variables influence persistence or departure. Findings of this study are presented in Chapter 4.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF THE DATA

The primary purpose of this study was to investigate first-year persistence in a Marshall University freshmen cohort. The study sought to validate the use of MAP-Works data to measure persistence of freshmen at Marshall University and to validate Tinto's model of student departure within this cohort. This chapter presents the data collected for this study and provides a statistical analysis of the data. The chapter is divided into the following sections: (a) population and sample; (b) respondent characteristics; (c) major findings for each of the four research questions addressed in this study; (d) ancillary findings; and (e) a summary of the chapter.

Population and Sample

The population for this study included the 1,958 freshmen enrolled in the Fall 2009 semester. Of this population, 1,340 students completed the *MAP-Works Transition* survey, 362 students completed the *MAP-Works Checkup* survey in November 2009, 281 students completed the *MAP-Works Checkup* survey in February 2010, and 176 students took both check-up surveys. Students were included in the data analysis if they took the *MAP- Works Transition* survey and one of the *MAP-Works Check-up* surveys. For those students who took both *MAP-Works Check-up* surveys, the February check-up data was used. Using these criteria, a sample of 467 students were included in this study (n=467). The sample used in the data analysis represents 23.8% of the total 2009 freshmen population.

Data Sources

Three data sources were used in this study. Data were obtained from Marshall University and were deidentified with no key code. The first data source was the *MAP-Works Transition* survey administered to freshmen in the UNI 101 course in September and October of 2009. The *MAP-Works Transition* survey contained questions related to pre-entry characteristics of students. The second data source was the *MAP-Works Check-up* survey which was available to students in November of 2009 and February of 2010. The *MAP-Works Check-up* survey contained questions that are related to student satisfaction. These surveys relied on self-reporting by students and were administered on a voluntary basis. The third data source was BANNER, Marshall University's student data management system. BANNER data used included sex, ACT composite score, credits earned, GPA, and persistence. BANNER data were deidentified with no key code provided to the researcher.

Respondent Characteristics

Of the 467 students in the sample, there were 316 females (67.7%) and 151 males (32.3%). Most (98.3%) students were enrolled full-time in the Fall 2009 semester. When considering their mother's or father's highest level of education, the majority (32.3% and 42.0%, respectively) of students were considered first generation college students (n=151, n=196, respectively). One hundred and five (22.5%) students' mothers and 98 (21.0%) fathers had some college. Sixty-two (13.3%) students' mothers and 19 (4.1%) students' fathers had associates degrees while 89 (19.1%) mothers and 90 (19.3%) fathers completed bachelor's degrees. Graduate degrees were held by 12.4% (n=58) of mothers and 12.8% (n=60) fathers. The educational attainment of two mothers (0.4%) and four

fathers (0.9%) was missing. A little over half (56.7%) of students lived in campus housing (n=265). One hundred ninety-four (41.5%) students were commuters with eight (1.7%) students not reporting current residence. Of the 467 students, 79% (n=369) persisted to the Fall 2010 semester and 21% (n=98) did not return for the Fall 2010 semester. Respondent characteristics are summarized in Table 1.

Table 1 Respondent Characteristics (n=467)

Characteristic	N	%
Gender		
Female	316	67.7
Male	151	32.2
Enrollment Status		
Full Time	459	98.3
Part Time	5	1.1
Missing	1	0.2
Mother's Highest Level of Education		
High School Diploma or less	151	32.3
Some College	105	22.5
Completed an Associate's Degree	62	13.3
Completed a Bachelor's Degree	89	19.1
Completed a Graduate Degree	58	12.4
Missing	2	0.4
Father's Highest Level of Education		
High School Diploma or less	196	42.0
Some college	98	21.0
Completed an Associate's Degree	19	4.1
Completed a Bachelor's Degree	90	19.3
Completed a Graduate Degree	60	12.8
Missing	4	0.9
Current Residence		
On Campus	265	56.7
Off Campus	194	41.5
Missing	8	1.7
First Year Persistence		
Persist	369	79.0
Depart	98	21.0

Major Findings

The major findings of each research questions are discussed in the following section. Findings that were ancillary to the research questions are presented in the last section.

Logistic regression analysis was performed on each of the identified independent variable predictors with the dichotomous dependent variable of persistence. Logistic regression was used to predict the odds of a student persisting based on each of the predictors. Data were reported as the odds ratio of persistence occurring over departure so that an odds ratio of 1.70 was interpreted to mean that the odds of a student persisting based on the independent variable tested was 1.7 times greater than that of a student departing based on that same independent variable. Internal consistency of the MAP-Works *Transition* and *Check-up* surveys was validated through Cronbach's alpha coefficient tests.

RQ1: To what extent, if any, do selected pre-entry characteristics as measured by the Map-Works Transition Survey predict persistence of Marshall University freshmen?

Data presented in the following sections include the results of logistic regression analysis of the relationship between pre-entry characteristics as reported on the *MAP-Works Transition* survey and whether students persisted until the Fall 2010 semester. The *MAP-Works Transition* survey contained questions related to pre-entry characteristics.

Student Characteristics. In the Student Characteristics section of the MAP-Works Transition survey, the relationship of the educational level of a student's mother was statistically significant ($p < 0.024$) with persistence. As the educational level of a

student's mother increased, the odds of persistence increased by 1.208. The relationship between the educational level of a student's father was statistically significant ($p< 0.008$). As the educational level of a student's father increased, the odds of persistence increased by 1.247. The relationship between persistence and high school GPA was statistically significant ($p<0.000$). The odds of persistence decreased 0.541 times for every one-point increase in high school. The relationship between the number of AP or dual credit course was statistically significant ($p<0.001$). Students were 1.237 times more likely to persist as the number of AP or dual credit classes. Table 2 summarizes Student Characteristics data.

Table 2 Student Characteristics Odds Ratios

Variable	Odds Ratio	Intervals
Mother's education	1.208	**1.025-1.424***
Father's education	1.247	**1.060-1.466***
Marshall as a college choice	0.963	0.696-1.333
Average high school grade	0.541	**0.431-.679****
AP or dual credit classes	1.237	**1.089-1.406***
Native English speaker	0.664	0.204-2.164

*Significance level of $p<0.05$
**Significance level of $p<0.000$

Academic Goals and Commitment. Three independent variables were significant in predicting persistence in the Academic Goals and Commitment section. The relationship with the level of education aspired was statistically significant ($p<0.032$) with persistence. As the level of education aspiration increased, the odds of a student persisting increased 1.215 times. There was a statistically significant relationship ($p<0.041$) between commitment to completing a college degree and persistence. Students

who reported they were committed to completing a college degree were 1.406 times more likely to persist. The relationship between the intention to persist and persistence was significant ($p<0.009$) with an odds ratio was 1.285. Data for Academic Goals and Commitment are presented in Table 3.

Table 3 Academic Goals and Commitment Odds Ratios

Variable	Odds Ratio	Intervals
Highest level of education goal	1.215	**1.016-1.452***
Declared a major	1.199	0.970-1.481
Commitment to completion of first year of college	1.236	0.840-1.817
Commitment to completion of college degree	1.406	**1.015-1.947***
Commitment to completion of college degree at Marshall University	1.157	0.878-1.525
Intention to return spring term	1.157	0.878-1.525
Intention to return Fall 2010	1.285	**1.064-1.552***

*Significance level of $p<0.05$

Financial Means. Three independent variables were significant predictors of persistence in the Financial Means section. The relationship between confidence in paying for social activities and persistence was statistically significant ($p<0.007$). As the confidence in paying for social activities increased, the odds of persistence increased 1.190 times. The results of logistic regression analysis yielded a statistically significant relationship ($p<0.022$) between the degree to which a large expense would result in leaving school and persistence. As the degree to which a large expense would result in leaving school decreased, the odds of a student persisting increased by 1.149 times. There was a statistically significant relationship ($p<0.024$) between degree to which a

financial situation would result in leaving school and persistence. As the degree to which a financial situation would result in a student leaving school decreased, persistence increased by 1.185 times. Data for Financial Means are summarized in Table 4.

Table 4 Financial Means Odds Ratios

Variable	Odds Ratio	Intervals
Confidence in paying tuition	1.103	0.959-1.267
Confidence in paying monthly living expenses	1.075	0.938-1.232
Confidence in paying major everyday expenses	1.076	0.935-1.239
Confidence in paying for social activities	1.190	**1.048-1.352***
Degree to which a large expense would result in leaving school	1.149	**1.020-1.295***
Degree to which financial situation would result in leaving school	1.185	**1.023-1.373***
Degree to which family finances impact ability to stay in school	1.050	0.945-1.168

*Significance level of $p<0.05$

Self-Assessment of Academic Skills. The results of logistic regression analysis for independent variables in the Self-Assessment of Academic Skills section yielded two significant relationships. The higher a student rated himself or herself in writing comprehension, the odds of persistence increased 1.234 times. Math ability was a significant predictor of persistence with a 1.212 increase in persistence ($p<0.006$). Table 5 summarizes the Self-Assessment of Academic Skills data.

Table 5 Self-Assessment of Academic Skills Odds Ratios

Variable	Odds Ratio	Intervals
Writing composition	1.234	**1.045-1.456***
Reading comprehension	1.166	0.988-1.376
Ability to verbalize ideas	1.147	0.961-1.370
Public speaking	1.054	0.913-1.218
Math ability	1.212	**1.056-1.390***
Computer skills	1.030	0.858-1.236
Problem solving	1.047	0.860-1.275

*Significance level of $p<0.05$

Self-Assessment of Management Skills. Of the thirteen predictors in the Self-Assessment of Management Skills, only one, "dependability" had a significant relationship with persistence. The odds of persistence increased 1.339 times the higher a student rated himself or herself as dependable ($p<0.019$). Self-Assessment of Management Skills data analyses are presented in Table 6.

Table 6 Self-Assessment of Management Skills Odds Ratios

Variable	Odds Ratio	Intervals
Self-discipline	1.138	0.931-1.392
Self-starter	1.190	0.982-1.442
Follows through	1.137	0.915-1.413
Dependability	1.339	**1.049-1.710***
Shows up on time	1.229	0.987-1.531
Works before playing	1.044	0.883-1.235
Plans out time	0.997	0.849-1.169
Sticks to time plan	0.976	0.833-1.143
Makes "to-do" lists	1.046	0.932-1.173
Balances time between classes and other activities	1.091	0.911-1.308
Optimistic	1.089	0.920-1.288
Easily adapts to new environments	0.922	0.842-1.170
Quickly adapts to new circumstances	1.034	0.875-1.220

*Significance level of $p<0.05$

Stressors. Four predictors of persistence were statistically significant in the Stressors section. The odds of persistence increased 1.241 times as the amount of stress related to finding time for non-academic activities decreased ($p<0.003$). As the degree to which students had to choose between two activities decreased, persistence increased 1.176 times ($p< 0.011$). Students who feel able to keep up with their obligations were 1.185 times more likely to persist ($p<0.010$). Students who report experiencing low stress were 1.173 times more likely to persist ($p<0.033$). Data for Stressors are summarized in Table 7.

Table 7 Stressors Odds Ratios

Variable	Odds Ratio	Intervals
Non-academic activities	1.241	**1.076-1.432***
Choosing between academics and social activities	1.176	**1.038-1.332***
Lack of time during week	1.078	0.955-1.216
Ability keep up with obligations	1.185	**1.042-1.347***
Knowing what is expected to succeed in classes	1.095	0.919-1.306
Allocation of time to meet obligations	1.115	0.937-1.327
Experiencing low stress	1.173	**1.013-1.357***

*Significance level of $p<0.05$

Self-Assessment of a Healthy Lifestyle. The Self-Assessment of a Healthy Lifestyle section contained two items, one of which, adequate amount of exercise had a statistically significant relationship ($p<0.030$) with persistence. As the amount of exercise increased the odds of a student persisting increased by 1.163 times. Data for Self-Assessment of a Healthy Lifestyle are summarized in Table 8.

Table 8 Self-Assessment of Healthy Lifestyle Odds Ratios

Variable	Odds Ratio	Intervals
Adequate sleep	1.082	0.931-1.259
Adequate exercise	1.163	**1.015-1.332***

*Significance level of $p<0.05$

Academic Experiences. No independent variables were significant predictors in the Academic Experiences section. Data are presented in Table 9.

Table 9 Academic Experiences Odds Ratios

Variable	Odds Ratio	Intervals
Anticipated grades in first term	1.046	0.930-1.177
Degree struggling in a difficult course	1.146	0.921-1.428
Meeting with instructors	0.988	0.841-1.160
Turned in homework	1.038	0.828-1.301
Completed required readings	1.049	0.889-1.238
Anticipated grade in difficult course	0.789	0.657-0.947

Class Attendance. The variable Class Attendance had a statistically significant relationship with persistence. As class attendance increased, the odds of persisting increased 1.769 times ($p<0.000$). The data analysis for Class Attendance is summarized in Table 10.

Table 10 Class Attendance Odds Ratios

Variable	Odds Ratio	Intervals
Class Attendance	1.769	**1.302-2.404****

**Significance level of $p<0.000$

Academic Self-Efficacy. Of the four variables in the Academic Self-Efficacy section, two were significant predictors of persistence. There was a statistically significant relationship between the confidence to do well on all problems and tasks and persistence ($p<0.033$). As the degree to which a student reported confidence in doing well on all problems and tasks increased, the odds of persisting increased 1.211 times. As the degree to which a student reported he or she was confident of doing well on all problems and tasks increased the odds of persistence increased by 1.192 ($p<0.038$). Data analysis for Academic Self-Efficacy is presented in Table 11.

Table 11 Academic Self-Efficacy Odds Ratios

Variable	Odds Ratio	Intervals
Confidence to do the hardest work assigned	1.135	0.964-1.335
Confidence to do well on all problems and tasks	1.211	**1.016-1.444***
Confidence to do well in hardest course	1.192	**1.010-1.408***
Confidence to persevere on class projects	1.107	0.927-1.322

*Significance level of $p<0.05$

Basic Academic Behaviors. There were six predictors in the Basic Academic Behaviors section and two had significant relationships with persistence. As student reported class attendance increased, the odds of persistence increased by 1.764 times ($p<0.000$). As the degree to which a student reported they were likely to turn in homework increased, persistence increased 1.639 times ($p<0.001$). Data analysis for Basic Academic Behaviors is summarized in Table 12.

Table 12 Basic Academic Behaviors Odds Ratios

Variable	Odds Ratio	Intervals
Class attendance	1.764	**1.284-2.422****
Paying attention in class	1.228	0.943-1.598
Taking good notes in class	1.082	0.867-1.350
Turning in homework	1.639	**1.228-2.189***
Recording assignment and tests in calendar	1.039	0.917-1.777
Spending adequate time studying	1.127	0.942-1.349

*Significance level of $p<0.05$
**Significance level of $p<0.000$

Advanced Academic Behaviors. Only one of the 13 variables in the Advanced Academic Behaviors section had a significant relationship to persistence. The more a student reported he or she studied on a regular basis, the more likely he or she was to

persist. The odds ratio was 1.211 ($p<0.033$). Advanced Academic Behaviors data analysis is summarized in Table 13.

Table 13 Advanced Academic Behaviors Odds Ratios

Variable	Odds Ratio	Intervals
Participating in class	1.064	0.907-1.249
Meeting with instructor during office hours	1.007	0.888-1.143
Communicating with instructor outside of office hours	0.951	0.844-1.073
Studying in place without distractions	1.068	0.918-1.242
Studying on a regular basis	1.172	**1.029-1.334***
Studying in blocks of time greater than one hour	1.122	0.987-1.275
Studying during most productive hours of day	1.047	0.912-1.203
Conducting weekly reviews of class notes	1.005	0.889-1.135
Completing assigned reading within a day before class	1.010	0.883-1.155
Reviews lecture notes within a day after class	0.940	0.828-1.069
Works on large projects in advance of due date	1.031	0.889-1.194
Conducts multiple work periods to complete large projects	1.092	0.938-1.270
Finished long-term projects at least three days in advance	1.103	0.972-1.253

*Significance level of $p<0.05$

Campus Involvement. One of the four predictors in the Campus Involvement section had a statistically significant relationship with persistence. Students who reported they were interested in participating in a student organization were 1.126 times more likely to persist ($p<0.033$). Data for Campus Involvement are summarized in Table 14.

Table 14 Campus Involvement Odds Ratios

Variable	Odds Ratio	Intervals
Interest in playing intramural sports	0.992	0.896-1.099
Intention to attend student functions	1.088	0.957-1.238
Interest in participating in a student organization	1.126	**1.009-1.257***
Interest in holding a leadership position in student organization	1.049	0.936-1.176

*Significance level of $p<0.05$

Peer Connections

Four variables were analyzed for a statistical relationship between peer connections and persistence. None of the variables had a significant relationship with persistence. Data for Peer Connections are summarized in Table 15.

Table 15 Peer Connections Odds Ratios

Variable	Odds Ratio	Intervals
Meeting people with common interests	1.088	0.943-1.255
Inclusion in activities with other people	1.047	0.920-1.192
Enjoy spending time with peers	0.998	0.865-1.150
Having likable peers	1.019	0.872-1.190

Current Residence

One variable was analyzed for a statistical relationship between current residence (on campus or commuter) and persistence. Current Residence did not have a significant relationship with persistence. Data for Current Residence are summarized in Table 16.

Table 16 Current Residence Odds Ratios

Variable	Odds Ratio	Intervals
Current Residence	1.032	0.654-1.628

Academic Adjustment

Five variables were analyzed for a statistical relationship between academic adjustment and persistence. None had a significant relationship with persistence. Data for Academic Adjustment are summarized in Table 17.

Table 17 Academic Adjustment Odds Ratios

Variable	Odds Ratio	Intervals
Keeping current with academic work	1.139	0.916-1.416
Motivation to complete academic work	1.099	0.906-1.333
Performing well in classes	1.099	0.906-1.333
Learning	1.032	0.833-1.280
Satisfaction with academic life on campus	1.105	0.917-1.332

Sense of Belonging

There were no significant relationships between any of the variables in the Sense of Belonging section and persistence. Data for Sense of Belonging are presented in Table 18.

Table 18 Sense of Belonging Odds Ratios

Variable	Odds Ratio	Intervals
Sense of belonging	1.145	0.974-1.346
Fitting in	1.088	0.924-1.282
Satisfaction with social life on campus	1.058	0.917-1.219

Overall Evaluation of the College

There were no significant relationships between persistence and any variables in the Overall Evaluation of the College section. Data for Overall Evaluation of the College are summarized in Table 19.

Table 19 Overall Evaluation of the College Odds Ratios

Variable	Odds Ratio	Intervals
Choose Marshall University again	1.105	0.950-1.286
Recommend Marshall University to someone	1.122	0.938-1.343
Overall Rating of Marshall University	1.175	0.969-1.424

Pre-Entry Characteristics from BANNER

Logistic regression analysis of the relationship between pre-entry characteristics from BANNER and whether students persisted until the Fall 2010 semester was conducted on three predictors. Of the three, only ACT composite score was a significant predictor of persistence. For every one point increase in ACT, the odds of persistence increased 1.138 ($p< 0.000$). Data for BANNER Pre-entry Characteristics are summarized in Table 20.

Table 20 BANNER Pre-Entry Characteristics Odds Ratios

Variable	Odds Ratio	Intervals
Gender	0.847	0.546-1.399
ACT Composite Score	1.138	**1.066-1.216****
Number of credit hours prior to Fall 2009 term	1.089	0.954-1.242

**Significance level of $p<0.000$

Summary of Findings for RQ1

In order to determine to what extent if any pre-entry characteristics predicted the persistence of Marshall University freshmen, 102 independent variables (99 from the MAP-Works Transition survey and three from BANNER) were assessed to determine statistical significance. Of these 102 independent variables, 26 had a significant

relationship with persistence. The odds ratios ranged from 0.541 for average high school grade to a nearly 1:2 odds ratio (1.769) for class attendance. Overall, the highest odds ratios were found for the Basic Academic Behaviors of class attendance (1.769) and turning in homework (1.639). Data for all significant relationships are summarized in Table 21.

Table 21 Summary of RQ1 Significant Relationships

Variable	Odds Ratio	Intervals
Class attendance (Class Attendance section)	1.769	1.302-2.404**
Class attendance (Basic Academic Behaviors Section)	1.764	1.284-2.422**
Turning in homework	1.639	1.228-2.189*
Commitment to completion of college degree	1.406	1.015-1.947*
Dependability	1.339	1.049-1.710*
Intention to return Fall 2010	1.285	1.064-1.552*
Father's education	1.247	1.060-1.466*
Non-academic activities	1.241	1.076-1.432*
AP or dual credit classes	1.237	1.089-1.406*
Writing composition	1.234	1.045-1.456*
Highest level of education goal	1.215	1.016-1.452*
Math ability	1.212	1.056-1.390*
Confidence to do well on all problems and tasks	1.211	1.016-1.444*
Mother's education	1.208	1.025-1.424*
Confidence to do well in hardest course	1.192	1.010-1.408*
Confidence in paying for social activities	1.190	1.048-1.352*
Ability keep up with obligations	1.185	1.042-1.347*
Degree to which financial situation would result in leaving school	1.185	1.023-1.373*
Choosing between academics and social activities	1.176	1.038-1.332*

Table 21 Summary of RQ1 Significant Relationships (continued)

Variable	Odds Ratio	Intervals
Experiencing low stress	1.173	1.013-1.357*
Studying on a regular basis	1.172	1.029-1.334*
Adequate exercise	1.163	1.015-1.332*
Degree to which a large expense would results in leaving school	1.149	1.020-1.295*
ACT Composite Score	1.138	1.066-1.216**
Interest in participating in a student organization	1.126	1.009-1.257*
Average high school grade	0.541	0.431-.679**

*Significance level of $p<0.05$
**Significance level of $p<0.000$

RQ2: To what extent, if any, does student satisfaction as measured by the *MAP-Works Check-up Survey* predict the persistence of Marshall University freshmen?

Data presented in the following sections include the results of logistic regression analysis of the relationship between student satisfaction as reported on the *MAP-Works Check-up* survey and whether students persisted until the Fall 2010 semester.

Academic Performance. The results of logistic regression analysis yielded two significant relationships in the Academic Performance section. For every increase in letter grade that a student anticipated for the current term grade, the odds of persistence increased 1.965 times ($p<0.000$). As anticipated final grades increased, the odds of persistence increased by 1.749 ($p<0.000$). Data for Academic Performance are summarized in Table 22.

Table 22 Academic Performance Odds Ratio

Variable	Odds Ratio	Intervals
Anticipated grade current term	1.965	**1.388-2.768***
Anticipated final grades	1.749	**1.312-2.331***
Confidence doing well in hardest course	1.090	0.920-1.293

*Significance level of $p<0.05$

Commitment. Both variables in the Commitment section had statistically significant relationship with persistence. Students who reported they were likely to return the next term were 1.613 times more likely to persist and students who reported they were likely to return next year were 1.573 times more likely to persist. Data for Commitment are summarized in Table 23.

Table 23 Commitment Odds Ratios

Variable	Odds Ratio	Intervals
Likelihood return next term	1.613	**1.351-1.926***
Likelihood return next year	1.573	**1.361-1.871***

*Significance level of $p<0.05$

Academic Integration. One variable, class attendance had a statistically significant relationship with persistence in the Academic Integration section. As reported class attendance increased, the odds of persistence increased by 1.613 times ($p<0.000$). Data for Academic Integration are summarized in Table 24.

Table 24 Academic Integration Odds Ratios

Variable	Odds Ratio	Intervals
Class attendance	1.693	**1.285-2.231***
Spending adequate time studying	1.012	0.835-1.228
Studying in place without distractions	0.994	0.845-1.169
Works in large projects in advance of due date	1.055	0.941-1.185
Keeping current with academic work	1.205	0.978-1.486
Balances time between classes and other activities	1.129	0.948-1.344
Number of courses struggling in	0.976	0.778-1.224

*Significance level of $p<0.05$

Social Integration. Of the six variables in the Social Integration section, two were significant predictors of persistence. The relationship between experiencing stress and persistence was statistically significant ($p<0.043$). As the level of reported stress decreased, the odds of persistence increased 1.143 times. The more students reported they enjoyed spending time with their peers, the likelihood of persistence increased by 1.161 times ($p<0.033$). Data analysis for Social Integration section is summarized in Table 25.

Table 25 Social Integration Odds Ratios

Variable	Odds Ratio	Intervals
Involvement in activities	0.996	0.965-1.027
Satisfaction with living situation	1.001	0.982-1.019
Having problems with people living near	1.007	0.991-1.023
Experiencing stress	1.143	**1.004-1.301***
Think about going home often	1.003	0.998-1.008
Enjoy spending time with peers	1.161	**1.012-1.332***

*Significance level of $p<0.05$

Financial Means. None of the variables in the Financial Means section was a significant predictor of persistence. Data analysis for the Financial Means section is summarized in Table 26.

Table 26 Financial Means Odds Ratios

Variable	Odds Ratio	Intervals
Confidence in paying tuition	0.989	0.977-1.002
Degree to which financial situation would result in leaving school	0.995	0.975-1.016

Overall Adjustment. Both variables in the Overall Adjustment section had statistically significant relationships with persistence. As satisfaction with academic life increased, the odds of persistence increased 1.398 times ($p<0.000$). As the sense of belonging increased, students were 1.429 times more likely to persist ($p<0.000$). Data analysis for the Overall Adjustment section are summarized in Table 27.

Table 27 Overall Adjustment Odds Ratios

Variable	Odds Ratio	Intervals
Satisfaction with academic life	1.398	**1.183-1.652***
Sense of belonging at Marshall University	1.429	**1.237-1.651***

*Significance level of $p<0.05$

Overall Evaluation of the College. All three variables in the Overall Evaluation of the College had statistically significant relationships with persistence. Students who reported that they would choose Marshall University again were 1.350 times more likely to persist ($p<0.000$). As the degree to which a student would recommend Marshall University to someone increased, the odds of persistence increased 1.307 times ($p<0.001$). As the overall rating of Marshall University increased, the odds of persistence

increased 1.482 times ($p<0.000$). Data for Overall Evaluation of the College are summarized in Table 28.

Table 28 Overall Evaluation of the College Odds Ratios

Variable	Odds Ratio	Intervals
Choose Marshall University again	1.350	**1.178-1.548***
Recommend Marshall University to someone	1.307	**1.109-1.540***
Overall Rating of Marshall University	1.482	**1.205-1.824***

*Significance level of $p<0.05$

Summary of Finding for RQ2

Twenty-five predictors from the MAP-Works Check-up survey were assessed for statistical significance in order to determine to what extent if any student satisfaction had on persistence of Marshall University freshmen. Approximately one- half (12) of the predictors were statistically significant with persistence. The odds ratios ranged from 1.143 for experiencing stress to 1.965 for anticipated letter grade for current term. Academic Performance, Commitment, and Overall Evaluation of the College had the highest overall odds ratios and predictive value for persistence. Data analysis for the significant relationships for RQ2 is summarized in Table 29.

Table 29 Summary of RQ2 Significant Relationships

Variable	Odds Ratio	Intervals
Anticipated grade current term	1.965	1.388-2.768*
Anticipated final grades	1.749	1.312-2.331*
Likelihood return next term	1.613	1.351-1.926*
Class attendance	1.693	1.285-2.231*
Likelihood return next year	1.573	1.361-1.871*
Overall Rating of Marshall University	1.482	1.205-1.824*
Sense of belonging at Marshall University	1.429	1.237-1.651*
Satisfaction with academic life	1.398	1.183-1.652*
Choose Marshall University again	1.350	1.178-1.548*
Recommend Marshall University to someone	1.307	1.109-1.540*
Experiencing stress	1.143	1.004-1.301*
Enjoy spending time with peers	1.161	1.012-1.332*

*Significance level of $p<0.05$

RQ3: To what extent, if any, does enrollment profile predict the persistence of Marshall University freshmen?

Data, including credit hours earned per semester and academic major at enrollment were used to evaluate a student's enrollment profile and persistence. Logistic regression analysis yielded a statistically significant relationship for the number of Post Term 1 credits ($p<0.000$). For every one credit increase, the odds of persistence increases by 1.316. Post Term 2 credits had a significant relationship with persistence ($p<0.000$). For every one credit increase, the odds of persistence increases by a factor of 1.299. Data for Credits Earned are summarized in Table 30.

Table 30 Credits Earned Odds Ratios

Variable	Odds Ratio	Intervals
Post Term 1 Credits	1.316	**1.224-1.416****
Post Term 2 Credits	1.299	**1.226-1.377****

**Significance at p<0.000

Of the 63 academic majors represented in the population sample, only two had statistically significant relationships with persistence. Both Medical Technology and Biological Science had an odds ratio of 8.036. Data of academic major are summarized in Table 31.

Table 31 Odds Ratios of Academic Majors

Variable	Odds Ratio	Intervals
College of Business		
Accounting	1.714	0.357-8.232
Economics	1.039E9	0.000-0.000
International Business	1.039E9	0.000-0.000
Finance	1.039E9	0.000-0.000
Management	1.500	0.306-7.361
Marketing	1.039E9	0.000-0.000
Pre-Business	1.039E9	0.000-0.000
Undecided Business	0.900	0.217-3.726
College of Education and Human Services		
Early Childhood Education	1.039E9	0.000-0.000
Exercise Science	1.039E9	0.000-0.000
Physical Education	1.039E9	0.000-0.000
Athletic Training	2.571	0.246-26.851
Elementary Education	1.029	0.255-4.156
Secondary Education	3.214	0.899-11.492
Pre-Counseling	1.039E9	0.000-0.000
Undecided Education	1.286	0.194-8.534

Table 31 Odds Ratios of Academic Majors (continued)

Variable	Odds Ratio	Intervals
College of Fine Arts		
Music	1.039E9	0.000-0.000
Theater	1.929	0.173-21.540
Visual Arts	1.125	0.254-4.975
Undecided Fine Arts	0.643	0.036-11.631
College of Health Professions		
Medical Technology	8.036	**1.519-42.517***
Social Work	1.039E9	0.000-0.000
Pre-Communication Disorders	2.571	0.246-26.851
Pre-Clinical Lab Science	1.039E9	0.000-0.000
Pre-Dietetics	1.039E9	0.000-0.000
BSN/ASN	1.571	0.405-3.302
College of Journalism		
Communication Studies	0.000	0.000-0.000
Broadcast Journalism	1.039E9	0.000-0.000
Print Journalism	1.039E9	0.000-0.000
Public Relations	1.039E9	0.000-0.000
Undecided Journalism	1.929	0.173-21.540
College of Liberal Arts		
Anthropology	1.039E9	0.000-0.000
Communication Studies	1.039E9	0.000-0.000
Criminal Justice	1.607	0.255-10.132
English	5.143	0.547-48.365
History	1.929	0.173-21.540
International Affairs	1.286	0.101-16.340
German	1.039E9	0.000-0.000
Political Science	2.893	0.505-16.582
Psychology	1.671	0.443-6.310

Table 31 Odds Ratios of Academic Majors (continued)

Variable	Odds Ratio	Intervals
Undecided Liberal Arts	1.135	0.459-3.882
School of Extended Education		
Regents Degree	1.039E9	0.000-0.000
College of Science		
Biological Science	8.036	**1.519-42.517***
Biomedical Sciences	1.039E9	0.000-0.000
Cell and Molecular Biology	1.039E9	0.000-0.000
Ecology	1.039E9	0.000-0.000
Chemistry	7.071	0.774-64.575
Forensic Chemistry	1.039E9	0.000-0.000
Biochemistry	0.643	0.036-11.631
Environmental Science	1.039E9	0.000-0.000
Geology	1.039E9	0.000-0.000
Computer and Information Technology	1.929	0.173-21.540
Biotechnology	1.039E9	0.000-0.000
Mathematics	1.039E9	0.000-0.000
Physics	0.00	0.000-0.000
Pre-Science	3.729	1.052-13.220
College of Information Technology and Engineering		
Computer Science	0.643	0.036-11.631
Engineering	1.039E9	0.000-0.000
Safety	4.500	0.471-42.970
Pre-Engineering	1.039E9	0.000-0.000
Pre-Computer Science	1.039E9	0.000-0.000
University College		
Conditional International	0.00	0.000-0.000
Conditional Undecided	1.039E9	0.000-0.000

* Significance level of $p<0.05$.

Summary of Findings for RQ3

In order to determine if enrollment profile (the number of credit hours earned and academic major) was a predictor of persistence for Marshall University freshmen, three independent variables were evaluated for statistical significance. The number of credits completed either in term 1 or term 2 yielded odds ratios of 1.316 and 1.299, respectively. Of the 63 academic majors, only two were significant predictors of persistence. Students who majored in Biological Science and Medical Technology were eight times more likely to persist.

RQ4: To what extent, if any, does academic performance predict the persistence of Marshall University freshmen?

Academic performance included the GPA for each semester as well as cumulative GPA for the academic year. The results of logistical regression analysis yielded a significant relationship between Post Term 1 GPA and persistence. For every one point increase in Post Term 1 GPA, persistence increased 2.866 times with a confidence level of 2.225-3.692 ($p<0.000$). Post Term 2 GPA had a significant relationship ($p<0.000$) with persistence. For every one point increase in Post Term 2 GPA, persistence increased 3.050 times with a confidence level of 2.390-3.892. Cumulative GPA was significantly related to persistence. For every one point increase in Cumulative GPA, persistence increased 4.209 times with a confidence level of 3.085-5.743 ($p<0.000$). Data for Academic Performance and persistence are summarized in Table 32.

Table 32 Academic Performance Odds Ratio

Variable	Odds Ratio	Intervals
Post Term 1 GPA	2.866	**2.225-3.692****
Post Term 2 GPA	3.050	**2.390-3.892****
Cumulative GPA	4.209	**3.085-5.743****

**Significance level p<0.000

Summary of Findings RQ4

Three independent variables were assessed for a statistical significant relationship between academic performance and persistence. All three were statistically significant. The odds ratios ranged from 2.866 (Post Term 1 GPA) to 4.209 (Cumulative GPA).

Ancillary Findings

Internal consistency for the MAP-Works Transition and Check-up surveys was determined by using the Cronbach's alpha coefficient. The reliability of the *MAP-Works Transition* survey was 0.932 (M = 0.127, range = 1.377). The Cronbach's alpha coefficients ranged from 0.025-0.936. Individual *MAP-Works Transition* survey section scores are summarized in Table 33.

Table 33 Internal Consistency for *MAP-Works Transition* Survey

Section	n	M	Range	Alpha Coefficient
Student Characteristics	6	-0.12	0.937	0.025
Academic Goals and Commitment	7	0.240	0.682	0.324
Financial Means	7	0.432	0.561	0.832
Self-Assessment of Academic Skills	7	0.248	0.590	0.683
Self-Assessment of Management Skills	13	0.363	0.750	0.874
Stressors	7	0.337	0.501	0.809
Self-assessment of Healthy Lifestyle	2	0.266	0.000	0.418
Academic Experiences	6	0.019	0.598	0.373
Class Attendance	1	--	--	--
Academic Self-efficacy	4	0.760	0.146	0.936
Basic Academic Behaviors	6	0.403	0.291	0.756
Advanced Academic Behaviors	13	0.423	0.598	0.904
Campus Involvement	4	0.418	0.410	0.733
Peer Connections	4	0.787	0.130	0.936
Current Residence	1	--	--	--
Academic Adjustment	5	0.648	0.150	0.900
Sense of Belonging	3	0.729	0.149	0.886
Overall Evaluation of the College	3	0.652	0.090	0.844
Overall Transition Survey	99	0.127	1.377	0.932

The reliability of the MAP-Works Check-up was 0.335 (M = 0.073, range = 1.188). The internal consistency of each section ranged from 0.059-0.874. Data for the internal consistency of the *MAP-Works Check-up* survey as measured through Cronbach's alpha coefficient is presented in Table 34.

Table 34 Internal Consistency for *MAP-Works Check-up* Survey

Section	N	M	Range	Alpha Coefficient
Academic performance	3	0.349	0.548	0.171
Commitment	2	0.305	0.000	0.464
Academic Integration	7	0.191	0.909	0.102
Social Integration	6	0.045	0.618	0.241
Financial Means	2	0.260	0.000	0.389
Overall Adjustment	2	0.035	0.000	0.059
Overall Evaluation of the College	3	0.711	0.109	0.874
Overall Check-up Survey	25	0.073	1.188	0.335

Summary

The sample population for this study was 467 students out of the 1,958 Fall 2009 freshmen cohort. The sample was 67.7% female and 32.2% male with 98.3% of students enrolled full-time. The majority of the students were considered to be first-generation college students. More than half (56.7%) of students lived in campus housing. First-time freshmen are required to live on campus unless they live within a 50-mile radius of Marshall University. Seventy-nine percent of students in the sample population persisted to the Fall 2010 semester.

The four research questions were addressed by data obtained from the *MAP-Works Transition* and *Check-up* surveys and Marshall University's student data system,

BANNER. Logistic regression analysis produced statistical significance in 26 variables in the pre-entry characteristics including parent's education, average high school grade, number of AP or dual credit classes, highest level of education goal, commitment to completion of college degree, intention for return for next term, confidence in paying for social activities, degree to which a large expense or financial situation would result in leaving school, writing comprehension, math ability, dependability, amount of stress including that associated with non-academic events, social activities, and obligations, amount of exercise, class attendance, confidence in academic performance, turning in homework, studying on regular basis, interest in joining a student organization, and ACT composite score. Twelve variables were statistically significant for student satisfaction including anticipated grades, likelihood of returning to school, class attendance, amount of stress, enjoying time with peers, satisfaction with academic life, sense of belonging, choosing Marshall University again, recommending Marshall University, and overall rating of Marshall University. Four variables, Post Term 1, Post Term 2 credits, and majoring in Medical Technology, and Biological Sciences were statistically significant for enrollment profile. Finally, Post Term 1, Post Term 2 and cumulative GPA were statistically significant for academic performance.

CHAPTER FIVE: CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Purpose of the Study

The purpose of this study was to determine what factors may affect first-year persistence of Marshall University freshmen during the 2009-2010 academic year. This study was also an opportunity to validate Tinto's model of student departure as well as evaluate MAP-Works as an early alert persistence tool in a Marshall University setting. The study examined the possible relationships between selected variables and student persistence. The following questions were addressed in this study.

RQ1: To what extent, if any, do selected pre-entry characteristics as measured by *The MAP-Works Transition Survey* predict persistence of Marshall University freshmen?

RQ2: To what extent, if any, does student satisfaction as measured by the *MAP-Works Check-up Survey* predict the persistence of Marshall University freshmen?

RQ3: To what extent, if any, does enrollment profile predict the persistence of Marshall University freshmen?

RQ4: To what extent, if any, does academic performance predict the persistence of Marshall University freshmen?

Methods

This case study used descriptive research to determine what factors influenced persistence in the 2009 Marshall University freshmen class. Selected variables were used to determine if a statistically significant relationship existed with persistence in the first year. The population of the study was the 1,958 freshmen admitted and enrolled in the

Fall 2009 semester. The study sample of 467 students was obtained by collating data sources and identifying those students from which data were available from three extant data sources. The sources were the *MAP-Works Transition* survey, the *MAP-Works Check-up* survey, and Marshall University's student enrollment management system, BANNER. Data obtained through these sources were analyzed using the Statistical Package for Social Sciences (SPSS) 19.0. Logistic regression analysis was performed on each identified variable to investigate whether a statistically significant relationship at the 0.05 alpha level existed. Internal consistency for the two survey instruments was determined through Cronbach's alpha coefficient analysis. Data were provided by Marshall University and were deidentified with no key code provided to the researcher.

Findings

The sample consisted of 467 students for whom there were data from all three data sources. The sample population was 23.8% of the total 2009 freshmen population. Of the 467 students in the sample population, 369 returned for the Fall 2010 semester for a 79% fall to fall retention rate. Three hundred sixteen (67.7%) were females and 151 were males (32.3%). Nearly all students were enrolled full-time (98.3%) and more than half (56.7%) lived in campus housing. A summary of findings for each research question is presented below.

RQ1: To what extent, if any, do selected pre-entry characteristics as measured by *The MAP-Works Transition Survey* predict persistence of Marshall University freshmen?

Logistic regression analysis of pre-entry characteristics resulted in 26 significant relationships. Persistence was significantly related to four student characteristics including parental education level, average high school grade, the number of AP or dual credit classes, and ACT composite score. Setting a high educational goal, being committed to completing a college degree, and having the intention to return for the Fall 2010 semester were also significant predictors of persistence. Regarding financial means, the confidence to which a student could pay for social activities, the degree to which a large expense would result in leaving school and the degree to which a financial situation would result in leaving school were predictors of persistence.

Students were asked to assess their academic and management skills, their academic behaviors and experiences, and their academic self-efficacy. Students who persisted rated themselves high in writing composition and math skills. Persisters also rated themselves as dependable. When asked to rate their academic behaviors, persisters were more likely to attend class, turn in homework, and study on a regular basis. Finally, confidence to do well on all problems, tasks and hardest course work were all predictors of persistence.

Students who persisted reported low stress. Overall low stress and low stress associated with non-academic activities, choosing between academics and social activities, and ability to keep up with obligations were predictors of persistence. In rating

a healthy lifestyle, persisters reported that they received an adequate amount of exercise. Persisters also reported that they intended to participate in a student organization.

RQ2: To what extent, if any, does student satisfaction as measured by the *MAP-Works Check-up Survey* predict the persistence of Marshall University freshmen?

Logistic regression analysis of student satisfaction resulted in 12 significant relationships. Academically, persistence was statistically related to anticipated letter grade for current term and anticipated semester final grades. Students who reportedly attended most classes increased their odds of persisting by nearly 2:1. Persisters also report that they were more likely to return for the following term or year and were satisfied with their academic life. Socially, persistence was significantly related to low stress, having friends, and a sense of belonging. Overall, persisters would choose Marshall University again, would recommend Marshall University to someone, and rated Marshall University favorable.

RQ3: To what extent, if any, does enrollment profile predict the persistence of Marshall University freshmen?

For enrollment profile, the number of credit hours completed each semester and academic major for each student were analyzed to determine if a statistically significant relationship existed with persistence. The number of credits a student completed was a predictor of persistence. Only two of the 63 majors were significantly related to persistence: medical technology and biological science.

RQ4: To what extent, if any, does academic performance predict the persistence of Marshall University freshmen?

Data analysis for academic performance included Post Term 1 GPA, Post Term 2 GPA and Cumulative GPA. All three were significantly related to persistence and produced the highest odds ratios of all variables analyzed.

Conclusions

Analysis of the data provided evidence to support the following conclusions.

RQ1: To what extent, if any, do selected pre-entry characteristics as measured by *The MAP-Works Transition Survey* predict persistence of Marshall University freshmen?

The student characteristics data analyzed in this study included sex, parental education, high school performance, ACT composite score, choice of college, and native English speaking status. Of these characteristics, only ACT composite score and parental education were significant predictors of persistence. For every one point increase in ACT composite score, the odds of persisting increased 1.138 times. Research shows that the higher the ACT, the higher the GPA and thus a greater level of persistence (DeBerard, Spielmans, & Julka, 2004; Gifford, Briceno-Perriott, & Mianzo, 2006). ACT assessments are of moderate strength when predicting persistence, with an odds ratio just slightly above 1:1 in this cohort of students, which supports the findings of Lotkowski, Robbins, & Noeth (2004). The educational level of a parent was also a predictor of persistence. As the educational level of parents increased, so did the odds of persistence. The majority of parents of students in this study had a high school diploma or less and only approximately 19% of mothers and fathers had bachelor's degrees. Several studies show that first-generation students have high departure and lower graduation rates (Choy,

2001; Ishitani, 2003). The findings of this study suggest that the first-generation status would play an important part in the overall persistence of this Marshall University cohort. First-generation students may not have role models or someone to ask for advice in navigating all the changes that are entailed with entering college. The only experience some of these students may have with college prior to attending is what limited exposure was available in high school such as college transition programs or information passed along by teachers or guidance counselors. Although it remains to be seen if the first generation students in this study will have lower graduation rates than non-first generation students, research would indicate that this may be the case.

High school experiences were significant predictors of persistence in this study. The number of Advanced Placement or dual credit courses that a student reported taking was a predictor of persistence. As the number of AP or dual credit courses completed increased, the likelihood of persistence increased 1.237. This finding is supported by Johnson (2008) who found that students who complete college preparatory curricula increased their odds of persisting by 1.16 times. However, credits at the beginning of term 1 were not a significant predictor of persistence of Marshall University freshmen. Although students potentially received the educational benefits of dual credit or AP courses, such as being well-prepared for college-level coursework and increased academic self-efficacy, these credits might not have been transferred at the beginning of the term 1 which may explain why the self-reported data were significant and the BANNER data were not. Another explanation may be the difference in training that high school teachers receive for teaching dual credit college course versus AP courses resulting in differential student preparation between the two types of courses. Teachers

receive professional development for AP course that includes a detailed curriculum whereas for dual credit courses teachers may only have a syllabus and no training to guide them in teaching a college-level course--which may lead to a less rigorous curriculum than traditional college courses (Dr. Jeffrey Smith, personal communication, June 5, 2011).

A second high school experience that was a predictor of persistence was self-reported average high school grade. As the average high school grade reported by students increased, the odds of persistence decreased. For every increase in high school letter grade, the odds of persisting decreased 45%. One explanation of this finding may be that high school grades are either inflated by the self-reporting of the student or grade inflation may have occurred and students were not as academically prepared as they thought. According to ACT, Inc. (2005), in the 13-year period from 1991-2003, high school grades, as self-reported by students were inflated 6.25% when compared to a standard measure of achievement. ACT, Inc. also found that high schools gave fewer Ds and Fs which may contribute even more to overall grade inflation. As supported by several studies, another plausible explanation for the decrease in persistence with an increase in high school GPA for the cohort in this study is that students may not feel academically challenged choosing instead to transfer to another institution (St. John, Hu, Simmons, Carter, & Weber, 2004). Students who perceive that they are not receiving a rigorous education or who believe that they are not being adequately prepared for future courses or graduate programs may decide to leave the institution in search of an education that they believe to be congruent with their high expectations and educational aspirations.

Academic or educational goals and commitment also had a positive relationship with persistence. The higher the educational goal, the more likely a student was to persist. This finding suggests that students who persisted were committed to finishing their degrees and believed they could attain their educational goal at Marshall University. The declaration of a major was not a significant predictor of persistence but the early timing of data collection may have been a factor in this finding. Students may not have been academically integrated within their particular major perhaps because they were taking few courses in their major with most of their course load in general education resulting in a low identity with their major both academically and socially.

The commitment to complete a college degree and the intention to return for the next term were predictors of persistence but neither the potential completion of a degree specifically at Marshall University nor even completion of the first year of college was a predictor. Students responded to this survey early in the Fall 2009 semester and although they had set an educational goal of college completion, academic and social institutional experiences may have been limited so that a commitment and identity with Marshall University or even the first year of college may not have been formed. Additional evidence for this finding is that Marshall University as a first choice for students was not a predictor of persistence.

Students who persisted reported that their financial situations would not impact their ability to remain in school. The financial situations of students may not be a critical factor in attending or persisting because Marshall University is a relatively low-cost state-supported school. Additionally, students who have just left home for the first time may be unaware of their family's financial status or they may not recognize the true cost of

college beyond tuition and books which were most likely paid for by parents or though financial aid.

In Robbins et al. (2004), academic-related skills were the top predictor of persistence. Confidence in academic skills is related to motivation to learn and educational attainment. Only two academic skills, writing composition and math ability were significant for persistence with this cohort of students. The higher that students rated themselves in writing composition, the more likely they were to persist. This is an interesting finding because college writing tends to be different from typical high school writing. High school writing often lacks the critical analyses and research-based writing that is encountered in college (Brockman, Taylor, Kreth, & Crawford, 2011). College writing often involves intellectual challenges that may not have been encountered by a student so if persisters were confident in their writing composition skills, they were likely well-prepared to be successful in college writing. The high self-rating in math finding is also intriguing. Math is an academic area where students often have low self-academic efficacy (Kamalizarch & Kadivar, 2006). As the self-assessment of math skills increased for the students in this study, so did the odds of persisting. This finding may be a result of persisters having confidence in their math preparation resulting in successful performance. Succeeding in math and writing in the first year would increase academic self-efficacy in students which then would increase motivation and commitment to education. These findings are encouraging because the 2009 National Curriculum Survey found that two–thirds of high school teachers believed at least one-half of their students were prepared for college level writing and math as compared to only one-third of college instructors reporting college readiness in their students (ACT, 2009).

Students who persisted in this cohort were not experiencing high levels of stress. The results indicate that as stress decreased, persistence increased. As Hertel (2002) stated, the transition to college is a stressful time in a student's life. However, stress may be relatively lower at the beginning of the semester when these questions were asked of the students. Higher stress levels are often associated with lower academic self-efficacy in first-year students (Hertel, 2002; Wang & Casteneda-Sound, 2008). In this study, students who persisted reported that they were confident in their ability to do well on all problems and tasks and to do well in their hardest courses indicating that they had high academic self-efficacy. This finding supports that of Robbins, et al. (2004) who also reports that academic self-efficacy was a predictor of persistence. Wang & Castenedea-Song (2008) found that students with low academic self-efficacy were more likely to experience stress and to depart. For this cohort of students, the lack of stress was a predictor of persistence. It can be inferred, therefore, that overall, stress levels were low including stress that would normally be caused by low academic self-efficacy. Persistence in this cohort was also related to the desire to finish a college degree. Academic self-efficacy, the self-assessment of academic success, is related to educational goals and commitment within Tinto's model of student departure and appears to be an important aspect to the persistence of the students in this cohort.

Several student academic behaviors were related to persistence. Of all the questions asked on the *MAP-Works Transition survey*, class attendance resulted in the highest odds ratio. As the self-reported class attendance increased, the odds of persisting increased almost 2:1. Studies have shown that class attendance is the best predictor of academic performance and thus persistence (Crede, Roch, & Kieszczynka, 2010).

Furthermore, class attendance as it relates to an academic performance predictor may be more of a measure of motivation and not necessarily intellect. Although it may be that students answered this question in what they believed to be a socially desirable answer, frequent class attendance may also be an indication of commitment to one's education which was also a predictor of persistence with this cohort. Class attendance may have been high this early in the semester as freshmen may not have realized that unlike high school, attendance in class is not necessarily mandatory. Turning in homework was also a basic academic behavior that was a significant predictor of persistence and whereas it too may have been a socially acceptable answer, it may also be connected to high educational goals. As with class attendance, it may be that college freshmen are still in "high-school mode" in which they turn in homework because it is expected of them, not because they believe it will increase learning. Studying on a regular basis was another predictor of persistence. It is not surprising that students who say they study on a regular basis are more likely to persist. Studying on a regular basis is indicative of motivation to succeed, and a commitment to one's education. At the time of this *MAP-Works Transition* survey, the persisters in this cohort appear to exhibit basic academic behaviors that will ultimately benefit them not only in persisting but also in completing their education.

Two behaviors that were not predictive of persistence involved communicating with an instructor during or outside office hours. This finding is somewhat disturbing in that one of the most important relationships students can have is with instructors. Whereas persisters may be those students who do not necessarily need to have formal or informal conversations with instructors, Pascarella & Terenzini's (2001) research

indicates that persistence is greater when students interact with faculty. Having difficulty in a course was also not a predictor of persistence so it is possible that students did not have a need to communicate with an instructor or perhaps more likely, students did not know either how to approach an instructor or understand that it was even an option, especially as nearly one-third of this cohort was first-generation.

In terms of social integration, the intention to join a student organization was a predictor of persistence. According to Tinto's model of student departure, students need to experience the informal and formal social systems of the university in order to socially integrate. The early timing of this survey may have been a factor in the other campus involvement predictors not being statistically significant because students may not have had opportunities to become involved on campus. However, as the intention to join a student organization was a significant predictor, it would appear that social integration is of moderate importance for the persistence of this cohort. A somewhat surprising finding was the lack of statistical significance for whether a student lived on campus or was a commuter. Living on campus would provide students the opportunity to make connections, friends, and perhaps be more socially and academically integrated. However, this finding is a positive result for Marshall University as it appears that neither living situation is beneficial over the other. It is also interesting that students who reported they exercised adequately were more likely to persist than those students who did not. One factor for this finding is that Marshall University opened a state-of-the-art exercise facility that may have appealed to students in not only healthy lifestyle sense but also as a social activity.

Academic adjustment was not a predictor of persistence. Although the early timing of the *MAP-Works Transition* survey may have contributed to these findings, academic experiences should be the early focus of students. Satisfaction with academic life, at least at the time of the survey in the academic term, was not a predictor of persistence. This finding is contrary to Sanders & Burton (1996) who report that academic satisfaction is the key predictor of persistence. This finding is not necessarily an indication that students were not satisfied with their academic life but more likely, that they had not yet formed a strong opinion either way. Students may not have received feedback in courses at the time of the survey or may not have reached a point in their courses where the hardest work or the most interesting events were taking place.

The sense of belonging construct on the *MAP-Works Transition* survey measured social integration as defined by Tinto (1993). Sense of belonging, fitting in, and satisfaction with social life on campus were not predictors of persistence at the time of the survey in the academic term. The early timing of the survey again may have an impact as students were still in the process of navigating the social systems of the University and had not concluded whether they were fitting in or satisfied with their social lives. This finding is also evidenced by the fact that the overall evaluation of Marshall University, including whether or not a student would recommend Marshall University or would attend Marshall University again was not a predictor of persistence. It would appear that at this early point in the semester, students had not yet made connections to Marshall University that would lead to strong commitments to the University.

RQ2: To what extent, if any, does student satisfaction as measured by the *MAP-Works Check-up Survey* predict the persistence of Marshall University freshmen?

The *MAP-Works Check-up* survey, administered in November 2009 and February 2010, was intended to assess student satisfaction by asking questions related to academic and social integration. Many of the questions were follow-ups to those asked on the *MAP-Works Transition* survey given earlier in the academic year to the same students. The results provided an insight into the longitudinal process of the development of student satisfaction that influenced persistence.

The results of academic performance as it relates to student satisfaction varied slightly from the results of these same predictors when assessed as pre-entry characteristics. Anticipated grades were not predictors at the beginning of the academic year but once students took the *MAP-Works Check-up* survey, anticipated grades, both current term and final, were predictors of persistence. Likewise, doing well in the hardest course was a predictor in the earlier *MAP-Works Transition* survey but not the *MAP-Works Check-up* survey. These findings are similar to those found in other studies regarding academic performance, student satisfaction, and persistence (Johnson, 2008; Kern, Fagley, & Miller, 1998; St. John, Hu, Simmons, Carter, & Weber, 2004; Szafran, 2001). It may be that for the persisters in this study, overall confidence in academic performance increased as the semester progressed leading to academic integration which had a positive influence on persistence.

Students were almost twice as likely to persist if they had the intention to return for the next term or year. The odds of persisting as a result of the intention to return were higher on the *MAP-Works Check-up* survey as compared to the *MAP-Works Transition*

survey (1.6 and 1.3, respectively). The intention to return is related to motivation and commitment to education (Pascarella & Terenzini, 2001; Tinto, 1993, 1998). For this study, commitment to a college education and operationalized as the intention to return for the next term or year is likely a measure of academic and social integration and subsequent educational and institutional commitment for this cohort of students.

The persisters in this cohort appear to be academically integrated. As in the *MAP-Works Transition* survey, class attendance was a predictor of persistence. This is a positive result in that it appears that students who are committed to their education recognize that class attendance is an important academic behavior. In terms of social integration, the results suggest that students who persist are not stressed and have made meaningful connection with peers. Low stress was a predictor on the *MAP-Works Transition* survey but enjoying time with peers was not. This result would lead to the inference that students who persisted made social connections increasing social integration.

At the time that the *MAP-Works Check-up* survey was administered (either late in the fall semester or the beginning of the spring semester), students who reported that they were satisfied with academic life and had a sense of belonging at Marshall University had a higher likelihood of persisting. This outcome represents an important shift from the *MAP-Works Transition* survey in which satisfaction with academic life and sense of belonging were not predictors of persistence. This is an important finding because it suggests that as Tinto (1993; 1998) outlines in his model of student departure, integration is a longitudinal process that is amenable to institutional interventions though the academic and social systems. Students who returned for the Fall 2010 semester were

more likely to choose Marshall University again, would recommend Marshall University to someone, and give Marshall University a high overall rating. Interestingly, none of these predictors were statistically significant for the *MAP-Works Transition* survey. The results of the data analysis for the *MAP-Works Check-up* survey, which is a measure of student satisfaction, indicate that students who make a connection with Marshall University both academically and socially are more likely to persist. It appears that those students who persisted had progressed through the longitudinal process as suggested by Tinto's model of student departure.

RQ3: To what extent, if any, does enrollment profile predict the persistence of Marshall University freshmen?

Credits Earned. The number of credits earned in both Post Term 1 and Term 2 were significant predictors of persistence. The more hours students completed, the better the odds were that they would persist. This finding supports research of Boyer (2005) and Stratton, O'Toole, & Wetzel (2007) who found that enrollment intensity, or the number of hours attempted in a term, was positively associated with persistence. The relationship with persistence may be two-fold. First, as research indicates, students who have high enrollment intensity view their academic life as more of a job than a past-time. Additionally, many freshmen are likely to have had six to seven courses in their senior year of high school so that high enrollment intensity in their freshmen year of college would not be a new experience. Fewer courses may mean less time engaged in academic activities and reduce the relative importance to a student as compared to all the other new experiences at college such as new-found freedom and their social life. Second, completion of courses may be an indication of a high commitment to the completion of a

degree and a student's overall educational goals. Research indicates that students who are part-time may see the end-point of their education as unattainable if progress is slow because of low enrollment intensity (Szafran, 2001). Although nearly all the students in this study were full-time, low enrollment intensity may have resulted in an extended graduation timeline for those who took either minimum hours or who did not pass courses that led to fewer hours completed for a term.

Academic Major. Only two majors, medical technology and biological sciences were positively associated with persistence. This finding supports the research of St. John, Hu, Simmons, Carter, & Weber (2004) which showed that students in majors with high income potential, such as health sciences, business, and engineering were more likely to persist than students in fields such as social sciences. In this study, students who were medical technology and biological sciences majors were eight times more likely to persist than students of any other major. Both of these majors have the potential to lead to well-paying jobs in the health field which may be a factor in persistence through educational goal commitment constructs. Persistence as it related to academic major has also been shown to be a function of program satisfaction (Cor, Suhre, Jansen, & Harskamp, 2007). Students who are satisfied with their academic major as measured by fulfilled expectations of the programs are more likely to persist. It should be noted however, that several majors had very few students which may have precluded statistical significance based solely on a low *n* value.

RQ4: To what extent, if any, does academic performance predict the persistence of Marshall University freshmen?

Of all the predictors assessed for persistence, academic performance as measured by GPA was the most predictive. For every one point increase in Post Term 1 and Term 2 GPA, the odds of persisting increased approximately three-fold and as Cumulative GPA increased, the odds of persisting increased four-fold. These findings support the research of Johnson (2008) who found that first-semester and first-year GPA had the greatest impact on persistence. Persistence as it is related to GPA may be indicative of several things. The higher the GPA, the more academically integrated a student is when interpreted with Tinto's model of student departure (Tinto, 1993). High GPA may also be related to high education goal commitment and commitment to the University.

Ancillary Findings

Persistence for this cohort of students followed Tinto's model of student departure. As Tinto (1993) predicted, students who persisted began the fall 2009 semester committed to completing their college degree and had the intention to return for their sophomore year. As evidenced by the change in student responses with regard to academic satisfaction, sense of belonging, and overall evaluation of Marshall University between the *MAP-Works Transition* and *MAP-Works Check-up* surveys, it was not until students experienced the academic and social systems of the university that they became academically and socially integrated. This longitudinal process confirms Tinto's model of student departure in a Marshall University context.

A high level of reliability for the *MAP-Works Transition* survey as measured by a Cronbach's alpha coefficient of 0.840 indicates that this survey may result in similar findings with other groups of students. The reliability of 11 of the 18 individual sections

of the *MAP-Works Transition* survey had internal consistencies as measured by Cronbach's alpha coefficient that are considered reliable. However, the remaining six sections had either low Cronbach alpha coefficients or had only one question per section so that internal consistency could not be determined. Although the overall reliability of the instrument was acceptable, individual section reliability may bring certain sections of the findings of this study into question.

The reliability of the MAP-Works Check-up survey as measured by Cronbach's alpha coefficient indicates that this survey may not provide similar findings when administered to another group of students. Of the seven individual sections, only Overall Evaluation of the University had an internal consistency that would suggest that similar results would be obtained from other sample populations. Although the results of the internal consistency indicate that these survey instruments may not be reliable for other sample populations, this study consisted of a case study on one cohort and as Tinto (1993) indicates, these results may not be generalizable to other cohorts in any case.

Discussion and Implications

The results of this study indicate that the persistence of the 2009 Marshall University freshmen cohort was influenced moderately by pre-entry characteristics, student satisfaction, enrollment profile, and to a much higher degree, academic performance. The findings also support the salient research on first-year persistence with little divergence from other studies. Finally, it appears this cohort followed Tinto's model of student departure as a longitudinal process of academic and social integration which would allow for institutional interventions designed to increase persistence.

Ultimately, students who persisted past their freshmen year made connections to Marshall University, which is evidenced by the positive change in the sense of belonging and evaluation of the University from the *MAP-Works Transition* survey to the *MAP-Works Check-up* survey. It also appears that academic integration is more important for persistence than social integration. Social integration was not a major predictor of persistence on either the *MAP-Works Transition* survey or the *MAP-Works Check-up* survey whereas academic integration increased from one survey to the next. However, the *MAP-Works Check-up* survey did not directly ask students if they were satisfied with their social life as it did with academic life satisfaction. This deficiency in the *MAP-Works Check-up* survey was disappointing as it made measuring the change in social integration a matter of inference and not a direct measure of student ratings. The lack of data on social integration makes the design and implementation of interventions directed at increasing social integration difficult as it is not completely clear what, if any, needs should be addressed in this area.

Another issue concerning the usefulness of MAP-Works as an early alert system is the way in which data are used to directly benefit students. Its usefulness is limited by how and if it is used to counsel students, evaluate programs, or implement new programs that are designed to increase persistence. Ideally, each student in addition to getting a report from MAP-Works should receive individualized advising and mentoring based on the student's individual responses and identified needs and deficiencies. Light (2001), in his interviews with college students, found that advising was the most underestimated service to students. The data for each student from *MAP-Works* could be a valuable addition to each advising session that might lead to meaningful and constructive

discussions, career counseling, and identification of interventions that may aid the student in academic success and aid Marshall University in increasing first-year persistence and graduation rates.

MAP-Works as a persistence tool is limited by the accuracy of data received from students and how those data are used by University constituents. One of the issues regarding the data obtained through *MAP-Works* is the low return rate. This study represents less than one-fourth of the 2009 freshmen class because of the limited collated data among the three data sources. Almost 70% of the freshmen class took the *MAP-Works Transition* survey but only one-third of the class took either of the two *MAP-Works Check-up* surveys. Although all surveys were available to students online and could be taken at any time during a certain window of time, the *MAP-Works Transition* survey contained over 150 questions which may have influenced a student's decision to not take the much shorter *MAP-Works Check-up* survey.

Another issue regarding the usefulness of MAP-Works is the timing of its administration to students. The early timing of the *MAP-Works Transition* survey was appropriate because it inventories student characteristics, intentions, and behaviors as baseline data enabling its use in identifying students who may be at risk of early departure and to assess what impact, if any, the University's academic and social systems have on the student. In this study, the *MAP-Works Check-up* survey was available twice, once at the end of the fall semester and once at the beginning of the spring semester, potentially making the data inconsistent in measuring student satisfaction. The *MAP-Works Check-up* survey should be given once students have had the time to experience the academic and social systems of the university, ideally at the beginning of the spring

semester. The later the *MAP-Works Check-up* survey is given, the more revealing the data as students would have received final grades for their first semester, would have had the opportunity to meet with their academic advisor, and would be taking a different set of courses from their first semester adding to the academic integration data.

The highest odds ratios for persistence in this study were associated with academic performance, specifically, GPA, which were obtained not through MAP-Works but through BANNER. That GPA was the strongest predictor of persistence was not an unexpected finding but it does bring into question the usefulness of *MAP-Works* as an early alert system because nearly all the odds ratios obtained through MAP-Works data were just above 1:1. The highest odds ratios obtained through MAP-Works involved class attendance and academic self-efficacy which also were not unexpected findings based on published literature. The use of MAP-Works as an early alert system and persistence tool is expensive and the data obtained directly from the program do not appear to add insight beyond that which is discernable through what is already reported in the literature. MAP-Works appears to be a valuable tool for inventorying individual student strengths and potential weaknesses that may affect persistence. It does not appear, however, to be valuable as an institutional tool that could be used to evaluate attrition risk in order to plan and implement persistence interventions on a campus-wide basis.

Concluding Remarks

The findings of this study suggest that a commitment to education is the predominant influence on persistence. Students who persisted in this cohort exhibited academic behaviors and attitudes that were related to a commitment not only to

completing their college education but also to Marshall University. The initial commitment to completing a college degree was evident by the academic behaviors of persisters. Students who persisted attended class, turned in homework, and studied on a regular basis. These basic academic behaviors more so than nearly any other measure or assessment of academic attainment a student possessed upon entry that influenced the decision to stay past the freshmen year. The commitment to Marshall University increased as the academic year progressed. Persisters became satisfied with their academic life and developed positive relationships with peers. Their commitment to the completion of their freshman year and subsequent commitment to Marshall University were strengthened by the interactions with the university's academic and social systems making what happened once they were on campus the most influential aspect of first-year persistence.

Recommendations for Further Study

This study focused on the persistence of a cohort of the Marshall University 2009 freshmen cohort. Recommendations for further study include:

1. This study focused on one cohort of students. Using more than one freshmen cohort would potentially reveal trends of persistence of Marshall University freshmen.
2. A longitudinal study of a cohort of students though their graduation would be useful to help to identify factors that lead to attrition beyond the first year.
3. A study of faculty use of MAP-Works would potentially provide strategies to optimize its use in intrusive advising.

4. With the increasing number of online courses at Marshall University, it would be interesting to conduct a study on first-year persistence with students who are enrolled in large numbers of online courses.

5. Finally, because a large number of students are first-generation college, a study on this sub-set of students would enable Marshall University to isolate and potentially ameliorate the unique needs of this cohort.

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APPENDICES

Appendix A: Relationship of Research Questions 1 and 2 with MAP-Works surveys

Appendix B: Relationship of BANNER data with research questions 1,2,3, and 4

Appendix A. Relationship of research questions 1 and 2 with *MAP-Works* surveys

Research Question	Operational Definition	Alignment with Tinto's Model of Student Departure	*MAP-Works* Survey Category
1	Pre-Entry Characteristics *(MAP-Works Transition Survey)*	Pre-Entry Attributes	Student Characteristics
		Initial Goals and Commitments	Academic Goals and Commitments
		Pre-Entry Attributes	Financial Means
		Initial Goals and Commitments	Self-Assessment of Academic Skills Self-Assessment of Management Skills Stressors Self-Assessment of Healthy Lifestyle Academic Experiences Class Attendance Academic Self-Efficacy Basic Academic Behaviors Advanced Academic Behaviors Campus Involvement Peer Connections Current Residence Academic Adjustment Sense of Belonging Overall Evaluation of the University
2	Student Satisfaction *(MAP-Works Check-up Survey)*	Academic Integration	Academic Performance
		Subsequent Goals and Commitments	Commitment
		Academic Integration	Academic Integration
		Social Integration	Social Integration
		Subsequent Goals and Commitments	Financial Means
			Overall Adjustment

Appendix B. Relationship of BANNER data with research questions 1,2, 3, and 4.

Research Question	Data
RQ 1 Pre-entry Characteristics	Gender
	ACT Composite Score
	# of credit hours already earned at beginning of term 1
RQ 3 Enrollment Profile	Post Term 1 total Credits
	Post Term 2 Total Credits
	Academic Major
RQ 4 Academic Performance	Post Term 1 GPA
	Post Term 2 GPA
Outcome (dependent variable)	Fall to fall retention (yes or no)