College Student Persistence in the Two-year Setting: Identifying Risk Early to

Guide Early Integration.

A Dissertation
SUBMITTED TO THE FACULTY OF
UNIVERSITY OF MINNESOTA
BY

Margo Keys

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Advisor: Dr. Shari Peterson

May 2013

Abstract

College student persistence is examined. The unique nature of the students and environment of the two-year college setting warrant concentrated research effort. The purpose of the study is to examine student variables associated with persistence and program completion to develop a pre-entrance risk assessment in the two-year college setting. Identifying student risk early to triage students toward interventions such as counseling, tutoring and developmental education courses may lead to answers to student integration, eventually leading to improved student retention. Definitions and limitations of the study are outlined. A literature review includes the theoretical underpinnings surrounding the study of student persistence. Relevant research related to risk factors of attrition pre-matriculation and post-matriculation are included. Ex post facto research will be completed to examine entering students in the 2008-09 academic year at a two-year technical college in the Midwest who participated in the voluntary intake assessment program (n=1127). Student entrance variables readily available at the time of enrollment were used. Variables studied included: Placement exam scores, age, enrollment status, gender, financial aid as independent variables. Student persistence and program completion serves as the dependent variables. Binary logistic regression was used. The independent variables did not have a notable relationship with student persistence or program completion for this two-year college population.

Table of Contents

List of Tables

CHAPTER 1

Introduction

Mortenson (2005) described student persistence as a student-initiated decision to stay in college. For over 70 years, scholars and practitioners have studied student persistence, seeking to understand why students leave college. Over the last 45 years, volumes have been written in an attempt to unravel the complexity of the persistence mystery (Astin, 1971, 1975, 1993; Astin & Panos, 1969; Bean & Eaton, 2001-2002; Johnson, 2012; Pascarella & Terenzini, 1991, 2005; Sedlacek, 1984, 2003; Seidman, 2005; Singell & Waddell, 2010; Tinto, 1975, 1987, 1993). While much has been written on the subject, especially in the four-year college setting, important questions remain unanswered as to why students leave before attaining their degree. Differences between four-year and two-year college experiences call for different approaches to the study of, and interventions to improve, student persistence. Understanding the variables associated with student persistence is the first step toward preventing attrition. For the purpose of this study, the term *student persistence* is defined as a student's re-enrollment in the following term; the term *program completion* is defined as a student's completion of program requirements.

The U.S. Department of Education reports total expenditures (i.e., operations, maintenance) at public degree seeking institutions to be $273 billion for 2008-09, with $225 billion directed to four-year and $47 billion directed to two-year institutions. This figure represents a 43 percent increase in the past decade leading up to 2008, with similar projections expected in the next decade. Average total expenditures by institution, per full-time student for 2008-09 include $36,000 for public four-year and $12,000 for public

two-year institutions, reported in current dollars (National Center for Education Statistics, 2011). Funding sources for public four-year and two-year institutions are primarily federal, state and local taxes, along with student contributions through tuition. As expenditures rise, public pressure for increased accountability of academic institutions to retain their students is expected to follow because billions of dollars are invested in a system to provide a college education in the U.S (Johnson, 2012).

The value of a college education is well documented (College Board, 2010, Bureau of Labor Statistics, 2010). The College Board publishes a periodic report outlining the value of a college education from both an economic and sociologic perspective. This report described the value of a college education to the individual and society as evidenced in increased income, reporting individuals with a bachelor's degree earning nearly twice the income of those with only a high school diploma (College Board, 2010). The U.S. Bureau of Labor Statistics (2010) also provided data to support the notion that a college education improves economic status by noting that earnings increase and unemployment risk decreases incrementally with increased education. For example, individuals with a high school diploma had a weekly earning average of $626 and an unemployment rate of 10.3 percent compared to individuals with a bachelor's degree who earned a weekly average of $1038 with an unemployment rate of 5.4 percent (Bureau of Labor Statistics, 2010).

Research also suggests that college impacts students in other positive ways as well. For example, Pascarella and Terenzini (2005) found that through changes in cognitive skills and intellectual growth, many students transformed themselves during their college experience. They reported statistically significant evidence of increased

critical thinking outcomes among four-year college students; they also reported that college graduates fare better than non-graduates on quality of life indices, tending to have better overall health, increased ability to make more efficient consumer decisions, and tended to save more of their income.

Student persistence and program completion is of concern in the community college environment. In the year 2000, the Department of Education reported that only 66 percent of community college students attained a credential within three years of entering (NCES, 2005). There is some evidence that retention rates are beginning to shift for both two-year and four-year institutions. American College Testing (2011) reported two-year public institution first year to second year retention rate to be 55.4 percent and four-year public institution first year to second year retention rate to be 65.6 percent. This finding reflects the highest rate for two-year public institutions in the past 27 years. Since 2005, the two-year public institution first year to second year retention rate rose 3 percent while the four-year public institution first year to second year retention rate declined by 3 percent (ACT, 2011). This shift in college student retention suggests positive change in the two-year setting is possible.

The U.S. government invests billions of dollars (NCES, 2011) to provide post-secondary education opportunities for students in four-year and two-year institutions but too many students enroll and leave without ever attaining a degree, having consumed resources without reaching their goal. Schneider (2010) reported that state and federal taxpayers spent $9 billion through appropriations to institutions and grants directly to students on first year college students who did not return for their second year during the five years between 2003 and 2008. Johnson (2012) estimated total institutional costs (i.e.

instructional and related expenditures) on average per student who leaves without finishing his/her degree at $18,125, equating to 19.5% of all education and related costs by institution. Given the institutional and societal costs associated with student attrition, institutions of higher education must increase their understanding of student persistence and the contributing variables, especially in the two-year college sector.

The student population in the two-year college setting is substantial, growing in volume and diversity. Technical and community college enrollments in the United States for fall 2008 totaled 12.4 million. Between the year 2000 and 2010, public two-year college enrollments increased 49% with an 11% increase between 2009 and 2010 (Hurlburt & Kirshstein, 2012). This population is a heterogeneous mix, both in age, race, and academic preparedness. The average student age is 28, and 60 percent are considered to be over the traditional college age (18-22). Women make up 58 percent of the student population with 45 percent minorities, 42 percent first generation, and 13 percent single parents (American Association Community Colleges, 2011). This diverse population creates a learning community characterized with high-risk factors (e.g. race, ethnicity, parental education, and age).

These at-risk student populations require early assessment and intervention to impact student retention (Seidman, 2005). Students in the two-year college setting are strong candidates for early assessment and intervention. Identifying risks early in the four-year college experience has led to early intervention and improved levels of persistence (Glynn, Sauer, & Miller, 2003).These promising results in the four-year college setting suggest pre-entrance student attributes are important to early understanding of student risk factors. Researchers at the University of Oregon used

readily available pre-entrance variables a priori to identify at-risk students (Singell &

Waddell, 2010). This research confirmed the ability to measure attrition risk with student

attributes and classified students by probability to persist, leading to actionable triage in

the four-year setting. Student risk factors need to be measured in the two-year setting to

determine the extent to which assessing risk factors early can direct preventative

interventions, influence student goal attainment, and guide two-year institutions with

resource allocation.

Summary of the Problem

As noted, approximately 55 percent of students enrolled in two-year public

colleges advance from their first year to their second (ACT, 2011) and, according to the

AACC, only 38 percent of entering community college students attain their Associate

Degree (AACC, 2011). Student attrition is expensive with taxpayers spending an

estimated $9 billion on first year four-year and two-year college students who do not

return (Schneider, 2010).

The unique nature of the students and environment of the two-year college setting

warrants concentrated student persistence research (Hirschy, Bremer, & Castellano,

2011). This diverse population is a heterogeneous mix, both in age, race, and academic

preparedness (AACC, 2011) ripe with student risk factors for attrition. Assessing student

attrition risk early in the college experience can direct interventions to influence goal

attainment and guide institutions with resource allocation.

Purpose of the Study

The purpose of the study was to examine student variables associated with

persistence and program completion to develop a pre-entrance risk assessment in a

specific two-year college setting, using student information readily available to the

admission office. This assessment could be used to triage students to appropriate

interventions. Research suggests student integration and involvement in the college

setting leads to increased retention (Astin, 1984, Tinto, 1987). Along those same lines,

Seidman (2005) suggested early identification and early intervention lead to increased

retention; however, the impact on at-risk student populations was unclear. The results of

the current study will be used to inform administrators responsible for college admission

policy and resource allocation in the two-year college setting.

The Research Questions

1. What is the relationship between student attributes known at the time of
    enrollment and persistence?

2. What is the relationship between student attributes known at the time of
    enrollment and program completion?

3. Is there a difference in the persistence of at-risk students who participate in early
    integration programming and at-risk students who do not participate in early
    integration programming?

4. Is there a difference in program completion of at-risk students who participate in
    early integration programming and at-risk students who do not participate in early
    integration programming?

Need for the Study

A college education is a valued asset. Graduates can expect to gain cognitive

skills, grow intellectually, and develop a moral grounding as they transform themselves

during their college experience (Pascarella & Terenzini, 2005). They can expect a better

quality of life and increased earnings compared to those without a college degree. Attaining a degree can improve social status and wellbeing (Bureau of Labor Statistics, 2010). Improving college student persistence rates has the potential to also improve economic conditions for communities and the nation.

Because college student persistence is the goal, understanding the factors contributing to attrition is an important first step (Astin, 1975; Munt & Merydith, 2011-12; Pascarella & Terenzini, 2005; Singell & Waddell, 2010; Tinto, 1987;). If greater knowledge can be gained, programs can be designed to remedy those factors proactively.

The diverse population of the two-year college setting creates a learning community characterized with high-risk factors. The volume of nontraditional age students, high minority populations, first generation college students, and high rate of employment, is fertile ground for student persistence challenges, (AACC, 2011). Administrators strive to create environments to meet an assortment of needs in the two-year college setting (Parnell, 1985).

The unique population served in the two-year college environment warrants concentrated study of student persistence (Hirschy, Bremer, & Castallano, 2011). Helping this vulnerable population reach their goals can improve economic conditions for students and their communities. Increased understanding of student risk factors pre-term or early in the term can lead to actionable triage in the four-year setting (Singell & Waddell, 2010). The value of this approach in the two-year setting is not clear.

Assessing student persistence risk at enrollment in the two-year college setting can be used to triage students toward interventions such as counseling and tutoring and may lead to answers to student integration, eventually leading to improved student

retention. This study seeks to bring clarity to these important questions and may contribute to the general body of literature in this area. Results may inform administrators responsible for college admission policy and resource allocation in the two-year college setting.

Definition of Terms

Drawing from the literature on college student persistence, the following definitions are used in this study:

At-risk college student:

An at-risk college student is a student who is unlikely to persist to complete their academic program requirements (Seidman, 2005).

Career commitment:

Career commitment refers to the degree of confidence a student has in his/her chosen program (Perry, Cabrera, & Vogt, 1999).

Degree commitment:

Degree commitment refers to the extent of determination a student has to complete his/her degree (Sorey & Duggan, 2008).

Early integration:

Early integration refers to studentsøfirst term use of college support services, such as counseling, tutoring, or developmental education (Chippewa Valley Technical College, 2012).

Program completion:

Program completion is achieved when all academic program requirements have been met (Chippewa Valley Technical College, 2012).

Semester persistence:

Semester persistence is achieved when a student re-enrolls in the following term (Singell & Waddell, 2010).

Stop out:

Stop out refers to a student who has experienced temporary interrupted enrollment and voluntarily did not re-enroll one term (Pascarella & Terenzini, 2005).

Drop out:

Drop out refers to a student who has left voluntarily and does not return to the institution within a specific period of time (McDermott, 2007).

Limitations

This study was limited to a single rural, moderate sized, public two-year college in the Midwest, specializing in career and technical education. The type of students enrolled in this institution may vary from students at other two-year colleges, limiting the generalizability of these findings to other two-year college students in other institutions.

Student race and residency are often included in other studies of student persistence. However, these variables were not included in this study since 93% of the students were Caucasian and 97% were in-state residents.

This study is limited to incoming students who participated in the voluntary intake assessment program, resulting in 35.3 percent of the new 2008-09 program students participating.

Overview of the Study

Chapter 1 included an introduction to the study, summary of the problem, purpose of the study, research questions, need for the study, definition of terms, and limitations. Chapter 2, the literature review begins with literature differentiating between four-year and two-year college settings. The theoretical underpinnings are focused on Astin's *Theory of Involvement* (1969, 1971, 1975, 1984, 1999) and Tinto's *Theory of Individual Departure* (1975, 1987, 1993). Research associated with risk factors of attrition is included in the literature review, segmented by pre-matriculation risk factors and post-matriculation risk factors. Chapter 3 describes the research methodology and method for this study. Chapter 4 describes the statistical results. Discussion and analysis of the research findings, conclusions and recommendations for future research and practice are presented in Chapter 5.

Chapter 2

Literature Review

The purpose of the study was to examine student variables associated with persistence and program completion to develop a pre-entrance risk assessment in a specific two-year college setting, using student information readily available to the admission office. The literature on student persistence was reviewed to examine the issues germane to the present research. The literature that follows is organized and synthesized in relation to those issues presented in three major areas: (a) background information, (b) theoretical underpinnings, and (c) risk factors of attrition. Each section will include relevant studies in the four-year and two-year college setting and the final sub-heading of each of these areas is a summary of the literature covered within that sub-heading.

The majority of published research on student persistence has been focused in the four-year college setting (Pascarella & Terenzini, 2005). Evidence is noted in the sheer volume of studies and publications available on the subject, with research in the four-year setting far exceeding that of the two-year setting. The most recognized foundational researchers in this field, including: Tinto (1975, 1987, 1993), Pascarella and Terenzini (1991, 2005), and Seidman (2005) largely studied persistence in the four-year setting. Other foundational researchers have applied the four-year models to the two-year setting (Braxton, Sullivan & Johnson 1997) and others have offered modified models for the two-year setting (Bean & Metzner, 1985; Webb, 1989).

Research on student persistence in the two-year college setting has emerged with more frequency in the literature. The research quantity difference between four-year and

two-year college settings suggested an in depth knowledge base for the four-year setting

and much to be gained in the latter. The differences in student demographics and campus

life alone suggest unique environments among four-year and two-year settings, especially

as these environments relate to pre-matriculation variables and integration. A brief

discussion of those differences is warranted. Thus, the overview begins with that

background information.

Background Information

Student demographics and environmental conditions differ between the four-year

and two-year college sector (American Association Community Colleges, 2011). These

differences impact the risk of attrition and solutions to prevent it. Differences between

the four-year and two-year college sector are included in this literature review under the

sub-headings of: (a) student demographics, and (b) environmental conditions.

Student Demographics

In the last decade, notable differences in student demographics were seen between

two-year and four-year institutions; those differences continue to exist today. Drawing

from the 2001 National Center for Educational Statistics's Baccalaureate and Beyond

Longitudinal Study, differences were noted in race, ethnicity, parental education and age.

The study segmented public two-year and public four-year non-doctorate granting

institutions. Higher populations of Hispanic, Asian, Native American/Alaska Native, and

Native Hawaiian/Pacific Islander were seen in public two-year colleges compared to

public four-year colleges with the latter twice the volume in the two-year setting. Parental

education was also notably different between the populations. The two-year setting shows

parental education of high school or less to be 28 percent compared to the four-year

setting of 17 percent. Variation was also noted in the category of õsome postsecondary educationö, with the two-year setting to be 23 percent and the four-year setting 17 percent. Student age was also notably different between two-year and four-year student populations. Age at the postsecondary level was higher for the two-year setting with 41 percent of students who were 25 years of age or older compared to 15 percent in the four-year setting (NCES, 2001).

More recently, the 2008 Baccalaureate and Beyond Longitudinal Study illustrated a slight shift in race percentages between two-year and four-year institutions in the past decade. Four-year colleges still had a higher percentage of Caucasian students (66 percent white) compared to 59 percent white in two-year colleges. However, the gap has narrowed in the past decade. In 2008, four-year colleges had fewer Black students(11 percent) and Hispanic students (9 percent) compared to two-year colleges with Black students comprising 14 percent and Hispanic students comprising 16 percent. (NCES, 2011). This difference illustrates higher diversity in the two-year college setting, although the gap appears to be narrowing.

Environmental Conditions

Environmental conditions also varied between two-year and four-year college settings. Differences were noted in mission and campus life. From their inception, two-year institutions have provided local communities with access to postsecondary education. NCES (2001) grouped two-year institutions into three categories: *community development and career institutions* which primarily offer degrees and programs linked to workforce needs; *community connector institutions*, offering general education courses and academic preparation to support transition to baccalaureate level; *community mega-*

connector institutions, found in urban areas providing workforce readiness, career and transfer programs. Common to all categories was the focus on community. Community colleges are largely funded and governed by local communities, respond to the workforce needs of the local community and focus on engaging local communities in the new knowledge economy (Levinson, 2005). Two-year institutions have a reputation of being open access colleges and unfortunately, as Levinson states, õattending a community college is typically viewed as a last-chance option for those who cannot gain admittance into a more competitive institution.ö (p.25). Admission criteria were viewed as less stringent in the two-year setting. Two-year institutions are often funded and governed by the community they serve and have a sense of obligation to serve those individuals, leading to the open access reputation. This was not found to be the case for four-year institutions.

In contrast, four-year baccalaureate institutions, both general and liberal arts offer programs of study and related activities intended to meet broad educational objectives as defined by the institution (Integrated Postsecondary Education Data System, 2011). The fields of study most common for baccalaureate degrees include: business, social sciences, history, health professions, and related clinical sciences (NCES, 2011). The degrees generally include major courses along with general education courses to support the major for the purpose of preparing the graduates for entry-level employment. Admission selectivity is common in four-year institutions with ACT and SAT scores primary criteria for admission. This population generally represents portfolios highlighting academic and extracurricular accomplishments. Publicly funded four-year institutions receive funding from state and federal agencies along with private donations. These institutions may be

governed by a State Board of Regents far removed from the local community and their concerns. At times this structure may contribute to delays in decision making and a reduced ability to react to local community need.

Differences between two-year and four-year institutions also are related to campus life. Students in two-year institutions are older often balancing multiple commitments, thus they participate in fewer campus activity. Additionally, enrollment and employment status impacted student time on campus for the two-year setting. The American Association of Community Colleges reported enrollment to be 41 percent full-time and 59 percent part-time students (AACC, 2011). This coupled with the fact that 27 percent of their full-time students are employed full-time and 50 percent are employed part-time, results in less time on campus for the two-year college student. The nonresidential nature of most two-year institutions also gave students less time on campus than their four-year counterparts.

The differences in mission and campus life also suggested differences in environmental conditions between two-year and four-year institutions. These differences impact student interaction and involvement on campus.

Each category within this literature review will include relevant studies for both the four-year and two-year setting. A literature overview of the theoretical underpinnings of student persistence follows.

Theoretical Underpinnings of Student Persistence

Researchers have examined this subject from numerous directions. Of interest to this study, is the issue of studentsø involvement and interactions with the college environment. An understanding of Astin and Tintoøs work is needed. This work is

presented in three major sub-headings: (a) Theory of Involvement, (b) Theory of

Individual Departure, and (c) Variations for the Two-Year Setting.

Theory of Involvement (Astin, 1975)

In the 1960s Astin carried out a series of national studies on college freshman

from 246 institutions, the first of which was conducted in 1961 with follow up reports in

1962 and 1965 (Astin, 1969). His intent was to assess differences between institutions

using student, environmental and institution variables. He examined student

demographics and student intentions data in year one of the project and collected

environmental information about the institution in 1962. In 1965, he resurveyed the

sample population four years after they had entered college. The results of this study laid

the foundation in this important field of study. Astin found evidence to suggest that

educational outcomes stem from student personality characteristics and environmental

conditions. He identified two patterns of environmental conditions of greatest impact.

First, the pattern of interpersonal relationships was identified as key to linking the student

with the environment. Astin found students who were actively involved in extracurricular

activities and interacting with peers and professors, were less susceptible to attrition. The

second environmental pattern noted in Astinøs results is administrative influence on the

environment. Evidence suggested college environments with severe policies (i.e. grading,

course selection, behavior) were linked to higher incidences of attrition. However, his

findings suggested that differences in student characteristics were responsible for large

differences in institution attrition rates. After controlling the student input variables, he

found students most likely to drop out were those with: low high school GPA, no

intention of graduate school, low socioeconomic standing, and being married (either when entering college or while in college).

This early work influenced the development of Astinøs (1971) I-E-O model. Astinøs model categorized relevant components as student inputs (I), college environment (E) and student output (O). Student inputs included student talent, skills, and aspirations or, as Astin put it, õraw materialsö (p.225). College environment referred to conditions found on campus that may impact the student experience such as policies and instructional practices. Student outputs included measures of achievement, values, and attitudes. This model provided structure for his continued interest in student persistence and helped to explain the complexity of this phenomenon (Astin, 1971). Results from Astinøs 1975 longitudinal study of college drop-outs confirmed the value of the I-E-O model and led to the development of his Theory of Involvement.

Astinøs Theory of Involvement developed as a result of his work with the 1975 longitudinal study. Through this study, Astin identified important factors linked to increased student persistence including: living on campus, the importance of social group memberships and involvement in extracurricular activities, and part-time employment on campus. Drawing from these results, he proposed the Theory of Involvement in an attempt to explain the relationship between õthe amount of physical and psychological energy that the student devotes to the academic experienceö (p.518) and student attrition (Astin, 1984).

In its early form, the theory of involvement included five tenets: (a) involvement referred to students investment of their õphysical and psychological energy in various objectsö (p.519); (b) student involvement occurred on a continuum; (c) involvement can

be measured in quantity and quality; (d) student learning corresponds to their

involvement in the educational program; and (e) policy and practice effectiveness did

impact student involvement (Astin, 1984).

According to the theory, students gain more if they invest more in their learning

experience. Students actively involved in their learning experience spend more time on

campus, participate in campus activities and are engaged in conversations with their peers

and campus staff. The uninvolved student may avoid student life activities, avoid

extended time on campus and does not interact frequently with staff or peers. Astin

linked his theory to the idea of *time-on-task* or the concept of *effort*, suggesting an

investment of time on task or extra effort, resulted in involvement with the learning

experience leading to increased student persistence.

His approach directed attention to student behavior and motivation rather than

subject matter or instructional strategies, and influenced others to follow this line of

research toward student interaction and engagement in the college environment. Tinto is

another prominent researcher early in this field of study.

Theory of Individual Departure (Tinto, 1975)

Tinto's theory (1975) suggested college student outcomes are linked to the

interplay between student pre-entry attributes, goals, and commitments, and their

institutional experiences (i.e. academic and social), suggesting increased interactions

between the student both socially and academically may positively impact their college

experience and willingness to persist to their intended outcome. Tinto suggested a portion

of students who terminate the student-institution relationship may leave just the college,

while others leave the academic system completely. According to Tinto, students may

leave voluntarily, while others are forced out due to academic performance, behavioral, familial, or health reasons (Tinto, 1987).

Tinto's *Theory of Individual Departure* has been studied extensively in the past 40 years. Tinto's theory of student departure draws from the field of anthropology and sociology through Van Gennep and Durkheim's work. Van Gennep's *Rite of Passage*, specifically the stages of separation, transition, and incorporation are used by Tinto as a comparison to the stages the student passes through during their college experience (Tinto, 1987). As students enter the college setting, they separate from previous experiences at home and other academic settings. In the transition stage students begin to experience the new environment and interactions with the individuals within it. During this phase, students learn new rules, roles, and expectations. Finally, the phase of ‑incorporation' included acceptance and adoption of those new rules and roles, becoming a member of this new community. The rite of passage from one stage to the next signified the student had adjusted to the change and could manage in the new environment.

Influencing Tinto's theory was Spady's (1971) adaptation of Durkheim's classic work on suicide, specifically the category of egotistical suicide. Durkheim described egotistical suicide for cases when individuals do not integrate into society socially or intellectually (Tinto, 1987). Tinto posited similarities between Van Gennep and Durkheim with student departure from college. Students who do not successfully move through each stage are at risk of departure and those who do not integrate socially or intellectually are at risk of departure. Tinto suggested academic institutions have formal and informal social and intellectual environments with differences noted between academic institutions, impacting the individual student uniquely. The student disposition,

comprised of their family background, skills, ability, prior schooling, intentions and goals played a key role in student-institution compatibility (Tinto, 1993).

Tinto's T*heory of Individual Departure* depicted the interplay between student pre-entry attributes, goals, and commitments, and their institutional experiences both academic and social, suggesting increased interactions between the student both socially and academically may positively impact their college experience and willingness to persist to their intended outcome. Tinto emphasized the importance of understanding both the student role and the institution's role in creating and supporting the interactive environment. "An institution's capacity to retain students is directly related to its ability to reach out and make contact with students and integrate them into the social and intellectual fabric of institutional life" (Tinto, 1987, p.180).

Tinto has been described by other scholars of college student departure, as one creating "paradigmatic status" (Braxton, et.al, 2004) because of the considerable consensus among scholars in this field concerning the probable certainty of his theory. Tinto's theory suggests academic and social integration is an influence to a student's subsequent commitment to the institution and graduation (Tinto, 1987). Tinto's theory has been tested numerous times which are described in the next section.

Tinto's theory was the focus of numerous empirical investigations in the traditional four-year college setting between 1977 and 1997 (Baumgart & Johnstone, 1977; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1979b, 1980; Terenzini & Pascarella, 1977, 1978), validating its use for the four-year setting.

Braxton, Sullivan and Johnson (1997) assessed the empirical validity of Tinto's theory and determined that revisions were warranted for residential and commuter

college settings. From Tinto⊘s model, they were able to identify 13 testable propositions to be used in a variety of institution types (four-year, two-year, commuter and residential). Results for residential universities showed support for five of the thirteen propositions. These results led to their revised model for residential institutions which include four of Tinto⊘s propositions: (a) student entry characteristics, (b) initial institutional commitment, (c) level of commitment to the goal of graduation, (d) subsequent institutional commitment and (e) expansion of social integration into six influences (i.e., student welfare, communal potential, institutional integrity, proactive social adjustment, psychosocial engagement, and ability to pay).

Commuter universities, in contrast, only showed support to two of the 13 propositions; student entry characteristics, and initial level of institutional commitment. For two-year colleges, they found only one of Tinto⊘s propositions (student entry characteristics directly affect the likelihood of students⊘ persistence in college) that showed robust empirical affirmation. Braxton, Sullivan and Johnson (1997) offered a revision of Tinto⊘s theory as it relates to commuter institutions emphasizing the following: (a) student entry characteristics, (b) external environment, (c) campus environment, (d) academic communities, and (e) implications for minority students. This revision omitted the subgroup of two-year commuter institutions although Braxton, Sullivan and Johnson do recommend further scholarship in each sector (four-year or two-year commuter, four-year or two-year residential).

Variations to Tinto's theory.

Terenzini and Reason (2005) offered a conceptual framework integrating the work of Astin (1985, 1993), Tinto (1975, 1993) and Pascarella (1985). This

comprehensive model was intended to identify the factors and influences surrounding

studentsø first year experiences and outcomes. The model included influences on student

learning and persistence specifically: (a) student precollege experiences and

characteristics, (b) organizational context, (c) peer environment, and (d) outcomes. Their

framework suggested students arrive at college with varying experiences and

characteristics that can improve or impede their interactions with the organization (i.e.

internal structure, policy, practice, faculty culture) and their peer environment (i.e.

classroom, curricular and extracurricular activities), impacting the final outcome

(learning, development, change, persistence).

　　　　While still considered a *college impact model* with an emphasis on environmental

and inter-individual origins of change, this model introduced the idea of organizational

behavior toward student persistence. The model identified organizational features such as

curricular configurations, policies on course size, practices for assigning faculty to

introductory courses which can illustrate the organizations approach to student

persistence. As Terenzini and Reason suggested õIt is more a function of what

organizations do, than what they areö (p. 8).

　　　　Reason (2009) suggested the comprehensive model framework provided the path

to reframe thinking about persistence, both in research and practice. He stated,

õinfluences on studentsø persistence decisions and behaviors are not uni-dimensional; our

solutions cannot be eitherö (p.675). Reasonøs view illustrated the evolution in thinking

about persistence over the past forty years. Early models and theories examined student

involvement and interaction in the college setting (Astin, 1971; Tinto, 1975) and Reason

directed researchers to examine how the student engaged and what the organization did to encourage it.

Other models proposed by Bean and Metzner (1985) and Webb (1989) for use in the community college setting were created since it was suggested Tinto's model failed to consider unique characteristics of community college populations, specifically age, gender and racial/ethnic diversity. These are discussed in the following segment.

Variations for the Two-Year Setting

Both Tinto and Astin's model and theory have significantly influenced the study of student persistence in the college setting, although evidence of their work is more commonly seen in the four-year environment. Bean and Metzner (1985) proposed a conceptual model for student attrition of nontraditional undergraduate students. They objected to the emphasis placed on student socialization as noted in the work of Tinto (1975) and suggested the older, part-time, commuter nontraditional student did not socialize to the same degree as the traditional aged college student and therefore proposed an alternate model, one that included environmental factors, student background characteristics and psychological factors (Bean & Metzner, 1985).

Bean and Metzner (1985) described four primary variables that influence student attrition for this population, including students with poor academic performance, intent to leave fueled by psychological factors, student background characteristics and environmental variables such as finances, hours of employment and outside encouragement. This model emphasized the importance of utility, satisfaction, goal commitment and stress (Bean & Metzner, 1985).

While Bean and Metzner's model had merit, empirical evidence of its value is small. Webb (1989) discussed the value for use in the two-year college setting, but expressed concerns the data collection for the psychological factors would consume critical time, time students could already be using to plan their departure. The battery of assessments needed to collect each of the variables (i.e. stress, utility, satisfaction) was viewed a deterrent.

Halpin (1990) applied a variation of Tinto's model to the community college setting. Studying first-time, full-time students in a rural community college in New York, Halpin confirmed the value of Tinto's model in this setting. Building on the previous work of Pascarella and Terenzini (1980), Halpin surveyed 291 students about their experiences and perceptions on college three weeks before the end of their first term. Using variables associated with student background, environmental conditions, social and academic integration, Halpin found indicators related to social integration to be less powerful for community college students. He found the key component of social integration (Peer Group Relation Scale) did not enter as a discriminant function, suggesting community college students have "communities" of association outside of the college setting lessening the need for the college experience. Halpin found 74.5 percent of the variance in academic and faculty themes suggesting a primary importance of academic integration.

Webb (1989) also proposed an alternative to Tinto's model for use in the community college setting, suggesting Tinto's model failed to consider unique characteristics of community college populations, specifically age, gender and racial/ethnic diversity. To test the model, Webb used ASSET placement test scores and

ASSET educational planning data related to background and educational plans to study Los Angeles Community College district freshmen during the period of 1983 to 1985. The study included students persisting to second term as the dependent variable and 29 independent variables ranging from demographic information to certainty of major and degree intent. Using correlation and step-wise regression Webb found evidence to support use of this model for the community college student population. Webb found primary effects with variables associated with ASSET scores, external environment, goal commitment, academic intent and expected student college-fit. Webb found secondary effects with variables associated with background characteristics (race, sex, ESL status) and academic confidence (need for academic help). Webb revised Tinto's model in an attempt to fit the two-year college setting. He included additional academic self-confidence and expected student-college fit factors and eliminated psychological outcomes. He recommended his model superior for the community college setting.

Voorhees (1987) studied a variation of Tinto's model by investigating the influence of demographic variables and academic integration in the community college setting. Voorhees performed logit modeling and found measures of academic integration (GPA, hours studying, frequency of interactions with faculty) to be independent of persistence in the community college setting. The subjects for his study included 369 new and continuing students in a suburban community college. Using the American College Testing program's Student Opinion Survey (Two-Year College Form) he determined academic integration of less importance in explaining persistence for community college students than noted in four-year settings. Voorhees subjects included a heterogeneous mix of entering students, rather than limiting his study to first time community college

students, suggesting this may explain why his results contrast similar studies. He

suggested community college students may have other commitments that prevent them

from interacting informally with their instructors and less time to study.

Peterson (1993) investigated a variation to Tinto's work by introducing career

decision-making self-efficacy as an influence of student integration for academically

underprepared students. Studying 418 full-time and part-time students of a degree

granting unit within a large urban, commuter public university, Peterson found a

relationship between career decision making self-efficacy and student integration. These

underprepared students had characteristics similar to students in community colleges.

Results also revealed that career decision making self-efficacy contributed the most to

explaining the variance in student goals, commitments, and intent to persist.

Summary of Theoretical Underpinnings

Two specific theories are most germane to this study: Astin's Theory of

Involvement indicated a student will gain more if he or she invests more in the learning

experience, leading to increased student persistence. Similarly, Tinto's Theory of

Individual Departure suggested the more students integrate and interact with the college

environment, the higher the chance they will remain. Tinto implied increased

interactions, both socially and academically, may positively impact students' college

experiences and willingness to persist to their intended outcome. Both theories have

prominence in the literature and have spawned significant threads of study since their

inception, largely in the four-year college setting.

Terenzini and Reason (2005) offered a conceptual framework integrating the

work of Astin (1985, 1993), Tinto (1975, 1993) and Pascarella (1985). This

comprehensive model identified factors and influences surrounding studentsø first year experiences and directs researchers to consider what organizations do, rather than focus on what they are.

Bean and Metzner (1985) proposed a model for student attrition of nontraditional undergraduate students, however little empirical evidence was found to support use of the model. Other researchers such as Halpin (1990), Webb (1989), and Voorhees, (1987) tested Tintoøs model in the community college setting with inconsistent results. Webb (1989) found external environment, goal commitment, and academic intent factors had primary effects on persistence and found academic self-confidence and background characteristics had secondary effect in the community college setting. Halpin (1990) confirmed the value of Tintoøs model in this setting. Halpinøs results indicate variables related to social integration to be less powerful for community college students, suggesting community college students have ÷communitiesø of association outside of the college setting, lessening the need in the college experience. Voorhees (1987) determined academic integration of less importance in explaining persistence for community college students than noted in four-year settings. Halpin and Voorhees both confirmed academic self-confidence and social integration less powerful in predicting student persistence in the community college setting.

Risk factors impact attrition for the community college student. The unique nature of the community college population with a high volume of nontraditional age students, high minority populations, first generation college students, and high rate of employment, would suggest risk. Several variables are associated with risk. Other researchers have investigated this important question.

Risk Factors of Attrition

Identifying student risk of attrition early is a preliminary step to intervention. Researchers have investigated student risk both pre and post-matriculation. Related research is reviewed beginning with pre-matriculation risk assessment followed by post-matriculation risk assessment.

Student Pre-matriculation Risk Assessment

Measuring student risk pre-enrollment has shown promising results in the four-year setting and may have value for the two-year setting. Researchers in the four-year setting have assessed student attrition risk using pre-matriculation variables with promising results.

Singell and Waddell (2010) developed a student retention model to identify student risk for attrition at the University of Oregon. Using student data readily available in the college intake process, they sought to create a model for early risk identification. Using only standard student information at the time of enrollment (i.e., gender, High School. GPA, SAT score, race, private High School, age, financial aid, residence, major) they developed models of student attributes to reveal differences in probability to return to the University of Oregon in the second quarter, second year and to graduation. Singell and Waddell found differences in probability to persist among these attributes: gender, residency, SAT scores, Financial aid, and race, indicating ̵personal attributes matter with regard to retention, but the pattern of effects is complex.ö (p 554). They found female residents less likely to return. They also found regardless of residency, students with high SAT scores and African American students were more likely to return.

Singell and Waddell (2010) admitted retention is a difficult outcome to predict and recommend their econometric analysis be used to identify student risk and to guide treatment of students below a given percentile ranking. Adding observed performance in college (GPA) strengthened the model's ability to predict retention. During phase two, they examined GPA and found student performance in each term contributes to the re-enrollment decision with first term student performance being the best predictor. Results indicated at-risk students can be identified early and observed performance increased the predictive power of their model with current college performance a predictor for retention. Singell and Waddell recommended admission offices consider these factors in making admission decisions. Implications include that colleges interested in meeting desired thresholds for retention, might admit students with less risk. While this approach may have merit for a selective university, adaptations are needed for the open access mission of the two-year college.

Glynn, Sauer and Miller (2003) also found pre-matriculation data useful in identifying student risk for attrition with incoming freshman. Their research included incoming freshman (n=5221) and examined student background variables of age, gender, parental education, residency, parental marital status, high school GPA. Phase two added student survey data collected early in the college experience which increased the predictive strength of their model. Results indicated student background variables along with goal commitment variables from the student attitude survey revealed a predictive validity of 83 percent: (83 percent of students were correctly classified). The intent of their work was to develop a model to provide early warning of at-risk students, those in danger of dropping out, and to direct those students toward institutional resources.

Application of their formula resulted in increased retention rates for this private urban university. The researchers reported a six percent increase in freshman retention for the initial cohort, followed by ten percent for cohort two and seven percent for cohort three, indicating continued benefit with the use of the model and triage system.

Porchea, Allen, Robbins, and Phelps (2010) examined predictors of long-term enrollment and degree outcomes for community college students. The sample (n = 4481) included fall 2003 students who participated in the Student Readiness Inventory (SRI) both pre-matriculation and at matriculation from 21 community colleges. The SRI included 108 Likert-type self-report questions. The researchers used three factors from the SRI: motivation (Academic Discipline and Commitment to College), social engagement (Social Activity and Social Connection), and self-regulation (Academic Self-Confidence and Steadiness). Academic preparation data included ACT, SAT, COMPASS test scores and self-reported High School GPA. Results revealed that the likelihood of degree attainment and transferring to a four-year university increase with better academic preparation (i.e. higher test scores). Two psychosocial factors were significantly predictive of degree attainment including: Academic Discipline and Commitment to College. They also found older students more likely to obtain a degree and male students less likely to obtain a degree.

Student Post-matriculation Risk Assessment

A common approach in assessing student risk of attrition is to study student variables once students are enrolled and interacting with the college environment (Bean & Metzner, 1985; Braxton, Hirschy, McClendon, 2004; Pascarella & Terenzini, 2005; Tinto, 1975, 1987, 1993;). Academic and nonacademic variables are commonly studied

post-matriculation, either as separate variables or in combination. Key research was selected to be included in this review.

Academic variables.

The use of academic performance variables to predict college success has been widely studied and debated for decades (Larson & Scontrino, 1976; Lavin, 1965; Pascarella & Terenzini, 1991, 2005; Weitzman, 1982) and continues to be a polarizing topic. Part of the concern is inconsistencies with measurements. Yet grades are central to the academic experience and often proxy to success. Pascarella and Terenzini (2005) claimed õcollege grades may well be the single best predictor of student persistence, degree completion and graduate school enrollmentö (p.396). Research to support the use of academic performance variables in the study of student persistence in the four-year college setting is included in this review. Related studies for the two-year setting are rare.

In the 1960s Astin studied college freshman from 246 institutions, investigating student attrition and its association to multiple variables, including academic variables. His intent was to assess differences between institutions using student, environmental and institution variables. After controlling the student input variables, he found students most likely to drop out were those with: low high school GPA, no intention of graduate school, low socioeconomic standing, married (either when entering college or while in college).

Since that time, empirical evidence has accumulated indicating college GPA is a consistent predictor of persistence and success (Adelman, 1999, 2006; DesJardins, Ahlburg and McCall, 1999; Friedman & Mandel, 2011-2012; Murtaugh, Burns & Schuster, 1999). Key studies were selected for this review.

Adelman (1999) used the longitudinal data from the High School and Beyond/Sophomore study to examine educational attainment. This national sample tracked students from 10th grade in 1980 to age 30 in 1993. Adelman studied eleven key academic and demographic variables and found the two most important explanatory variables were Academic Resources (i.e. ACT/SAT, HS class rank, HS GPA and Academic curriculum intensity) and continuous enrollment. Adelman found Freshman GPA and trend GPA statistically significant predictors of degree completion for students in four-year institutions.

Adelman (2006) again examined this issue in a replication study. This national sample tracked eighth graders in 1988, scheduled to graduate high school in 1992 and were followed to December 2000. Results indicated Academic Resources is still the strongest pre-college indicator and Freshman GPA a strong positive contributor toward bachelor degree completion. Adelman noted other patterns associated with high degree completion. Results indicate students with 20 or more credits in the first calendar year of enrollment tend to persist at a higher rate. Results also indicated a low ratio of course withdrawals and no-credit repeats is associated with higher student persistence. In addition, he found a strong correlation between students who earn credits in summer term and bachelor degree completion.

Murtaugh et al. (1999) also confirmed first-quarter GPA predictive of persistence from year one to year two. Drawing from the Oregon State University data warehouse, researchers examined 8,867 first-time freshmen in fall quarters from 1991 through 1995. Murtaugh et al. developed a proportional hazards regression model comprised of demographic and academic variables to predict student probability of leaving. A

proportional hazards regression model allowed each independent variable (risk factor) value to be multiplied by the regression coefficients (estimated by the data) through maximum likelihood method. Using multi-variate analysis, the research team found strong association of student retention with age, residency, high school and first quarter college academic performance, specifically, statistical significance for high school GPA, first quarter college GPA and participation in freshman orientation.

DesJardins, Ahlburg and McCall (1999) found students with high academic performance in college were indeed less likely to stop out, although the strength of this association weakened over time. Using event history modeling at the University of Minnesota, DesJardins, et al. (1999) examined 4100 students entering as freshman (i.e. less than 39 transfer credits) in the fall of 1986. Independent variables included race, gender, home location, enrollment age, high school indicators and financial aid. Results revealed variation by race and by year of stop-out which was consistent with many variables (gender, disability, home location, enrollment age). Of particular interest was the variable of GPA and its association with stop-out. DesJardins, et al. reported, õStudents who perform well in college (as indicated by higher GPAs) are less likely to stop out over the seven years observed but the strength of this relationship tends to dissipate over timeö (p. 383). While the researchers acknowledged the limitations of this single institution study, its implications cannot be overlooked as it relates to GPA as a predictor of student persistence.

Friedman and Mandel (2011-2012) studied academic variables and the relationship to student motivation predictors. The sample included freshman students entering a state college in New York during 2006-2007 (n=1372) to determine if

motivational predictors (i.e. student achievement, affiliation, autonomy and dominance) as measured by Needs Assessment Questionnaire (NAQ) could predict academic performance and retention beyond traditional academic measures (i.e. HSGPA, SAT). They found a positive relationship between motivational factors (i.e. achievement, affiliation, autonomy and dominance) and high GPAs during the first year of college. Only HSGPA predicted cumulative GPA at the end of the first year. They found SAT scores, HSGPA, and motivational needs were related to student retention.

Two-year college sector.

Published research on student persistence in the two-year setting is sparse. However, some evidence was found to support the predictive power of academic variables in the two-year setting.

Webb (1989) used academic indicators and educational planning data to study Los Angeles Community College district freshmen. This study was described previously under the section of *Variations to Tinto's Theory in the two-year setting* and is again briefly mentioned here. The study examined student persistence and 29 independent variables ranging from demographic information to certainty of major and degree intent. Webb found evidence that external environmental, goal commitment, and academic intent factors had primary effects on his model. Environmental factors included; financial aid, hours working, and day or evening enrollment status. Goal commitment factors included: educational goal, certainty of major, and full-time or part-time enrollment status. Academic intent factors included vocational program status and the presence of a two-year degree plan. Webb found a combined approach of academic (first term GPA)

and key variables (i.e., external environment, goal commitment, academic intent) explained 31 percent of the variance in degree persistence (i.e. Freshman year retention)

Sorey and Duggan (2008) examined academic and nonacademic predictors of persistence in the two-year setting. Emphasis was placed on differences between adult and traditional aged students. In a large public community college in the Southeast, they studied 700 students, divided between traditional aged and adult student populations. The analysis examined differences between the groups on 18 variables, including but not limited to: degree type, employment, dependents, financial support, degree utility, intent to leave, goal commitment, academic and social integration. Discriminant function coefficient comparisons between the two groups revealed differences. The indicator of ─encouragement and supportø was the strongest predictor of persistence for traditional-age students with a correlation of .609, followed by academic integration correlation of .446 and Fall GPA correlation of .417. They did find that a larger number of persistence predictors had a significant influence on the adult population with the correlations for the top three indicators: social integration (.821), institutional commitment (.804), and degree utility (.632). These same indicators were less associated with persistence for the traditional aged students: (.050), (.223), (.289) respectively. While the response rate was low (17.6), the results are intriguing, specifically the high correlation of social integration (.821) for the adult population, as this is counter to early work by Metzner and Bean (1987). Differences between institutions may account for this variation as Metzner and Bean studied the adult population in a four-year commuter university and Sorey and Duggan studied it in the two-year setting.

Attewell, Heil and Reisel (2010) also examined this topic. Using the Beginning Postsecondary Students Longitudinal Study, they examined the predictive power of competing explanations of college non-completion. Variables studied included: race, gender, socioeconomic status (parent income, parent education), high school preparation (GPA, highest math), financial aid, work hours, remediation, and nontraditional college traits (delayed enrollment, married, single parent) with the dependent variable of college completion in six years from any institution. Analyzing data from 1996-2001, they employed a sheaf coefficient method to understand the explanatory strength of variable sets. Within the two-year college subset, they found family socioeconomic status predicts graduation. High school preparation (i.e. GPA, SAT, highest math) was statistically significant in Model 2 (i.e. race, gender, parent SES, preparation), though it was moderately associated with other background characteristics. Model 3 added factors of financial aid, integration and work, increasing the R^2 to .201, up from .084 in Model 2. However, these additional covariates reduced high school preparation and remediation to not significant predictors in Model 3. This suggested academic preparation is õnot a significant predictor of degree attainment for students entering community or two-year colleges, after other factors are controlled.ö (p.550). Attewell, et al. found financial aid dollar amounts to be high predictors of completion. In addition nontraditional student profiles (delayed college entry, part-time status) were associated with low graduation rates in the two-year college setting (Attewell, et al., 2010).

Non-academic variables

A wide array of nonacademic variables have been used to study student persistence post-matriculation (Astin, 1969; DeBarard, Spielmans & Julka, 2004; Munt &

Merydith, 2011-2012; Pascarella & Terenzini, 1997; Seidman, 2005; Sorey & Duggan, 2008; Tinto, 1975; Webb, 1989) in both the four-year and two-year college setting. Relevant studies involving four-year and two-year institutions have been selected for inclusion and are reviewed within the categories of student characteristics and goal commitment.

Student characteristics.

Astin (1969) and Tinto (1975) both examined numerous student characteristics elements in their foundational studies as previous stated in this report. Both studies examined post-matriculation student data, including student integration and involvement in the college environment. Pascarella and Terenzini's (1997, 1980 and 1991) work to validate Tinto's model included student characteristics collected post-matriculation. The results of their studies set a direction for this field of research

DeBarard, Spielmans, and Julka (2004) examined psychological predictors of academic achievement and retention in college freshman post-matriculation. A sample of 204 undergraduate freshmen in an introductory psychology and sociology course from a private west coast university participated in their study. Data was collected through three instruments: Multidimensional Social Support Scale (MPSSS), Ways of Coping Checklist-Revised (WOC), Short-Form Health Survey-36 (SF-36). Students completed the surveys during the first week of class. They found statistically significant correlations for several nonacademic variables to GPA (year1) including: *Escape avoidance coping*, *Acceptance-focused coping, Total social support, SF-36 Physical composite.* They found a number of variables were associated with cumulative GPA including: female gender, HS GPA and SAT scores. Results indicated their model was statistical significant and

accounted for 56 % of variance in cumulative GPA, however the model could not predict student retention (i.e. remained enrolled three terms).

Munt and Merydith (2011-2012) examined the relationship of studentsø personality traits and psychosocial characteristics with academic retention post-matriculation. A sample of 216 students from a private four-year career-focused, technical institute in New York were used to investigate differences between academic non-achievers and academic achievers. Data was collected over three years (spring 2005-spring 2008). Using the 16PF-5 Personality Questionnaire developed by Cattell, Cattell, and Cattell and a local instrument (College Student Questionnaire) designed to measure student self-perceptions of academic behaviors and psychosocial factors, the researchers noted differences between groups. Results indicated non-achievers (not academically retained) scored lower on *Tough-Mindedness,* and *Self-Control* with *Emotional Stability* significantly lower for non-achievers. The two groups did not differ in the variables of *Interpersonal relationships* and *Academic belonging*, which surprised the researchers.

College student persistence research using post-matriculation, nonacademic variables in the two-year college setting is important to include in this literature review.

Two-year college sector.

Webb (1989) studied the unique characteristics of community college populations. Webb used academic, nonacademic indicators, and educational planning data collected both pre and post-matriculation. The study examined student persistence and 29 independent variables ranging from demographic information to certainty of major and degree intent. Webb found evidence that external environmental, goal commitment, and academic intent factors had primary effects on his model.

Environmental factors included; financial aid, hours working, and day or evening enrollment status. Goal commitment factors included: educational goal, certainty of major, and full-time or part-time enrollment status. Academic intent factors included vocational program status and the presence of a two-year degree plan. Webb found a combined approach of academic (first term GPA) and key variables (external environment, goal commitment, academic intent) resulted in 31 percent of variance in degree persistence.

Cofer and Somers (2001) carried out multi-institution research of two-year colleges. Using the National Postsecondary Student Aid Survey (NPSAS) dataset from 1995-96 and 199two-93, Cofer and Somers examined student debt-load and other variables to within-year persistence for the two-year college setting. Their model included a number of factors such as: background (gender, age, income, marital status, parental education); aspiration and achievement (degree level aspiration, SAT/ACT); and college experience (type of institution, GPA, class rank, residence, hours worked). Regression techniques revealed significant persistence variables for each cohort. The 1993 cohort included race (other), aspiration (to college degree) and financially dependent as positively associated with persistence. Negatively associated with persistence were the variables of low GPA, freshmen status, and working full-time. The 1996 cohort included degree aspiration, sophomore status, and full-time status as positively associated with persistence. Similarities between the two cohorts were seen in the positive association between degree aspiration and student persistence. This provided another example of the value of these nonacademic variables in the study of student

persistence for the two-year college setting and illustrated the variety of variables under study.

Goal commitment is another important nonacademic variable with relevance to this study and worthy of inclusion in this review.

Goal commitment variables.

Student commitment to an educational goal or to a specific institution is a nonacademic variable of interest to researchers (Seidman, 2005; Tinto, 1993;). Evidence has suggested studentsø aspirations do positively correlate to persistence (Astin, 1975; Pano & Astin, 1968;Tinto, 1993). Tinto placed significant emphasis on this category of variables suggesting õThe higher the level of oneøs educational or occupational goals, the greater the likelihood of college completionö (p. 38). Goal commitment variables are important indicators of student retention and can be found in the form of intentions, educational goals, degree aspiration, and academic goals. (Robbins, Le, Davis, Lauver, Langley, Carlstrom, 2004; Sorey & Duggan, 2008; Tinto, 1993). Two recent studies with an emphasis on goal commitment are worthy of inclusion in this review.

Harackiewicz, Barron, Tauer and Elliot (2002) examined student goals and ability measures as predictors of academic success in college. A total of 471 first-semester students participated through enrollment in an introductory psychology course at a large Midwestern university. This study included a long term follow-up seven years later. To measure student goals and interest measures, data was collected at two intervals. Students completed a self-report questionnaire measuring adoption of mastery, performance-approach and work avoidance at week three of term and near the end of term completed a student interest in psychology survey. Using a series of regression analyses, results

indicate achievement goals (i.e. adopted goals from introductory psychology course) has an effect in the short term. Students with performance goals in the introductory course did achieve a higher grade in the class. However, the effects of goal setting were smaller with the seven year follow up.

Robbins, Le, Davis, Lauver, Langley and Langley (2004) completed a meta-analysis to examine if psychosocial and study skill variables predict college outcomes. The meta-analysis included 109 studies and examined nine separate constructs with the psychosocial and study skill factor category including academic achievement, academic goals, institutional commitment, social support, social involvement, academic self-efficacy, general self-concept, academic related skills, financial support, size of institution and institutional selectivity. Most of the psychosocial and study skill factors did indeed correlate positively to student retention. The three constructs with the strongest predictive value for college retention were academic goals, academic self-efficacy and academic-related skills. Results also revealed a relationship between psychosocial factors and GPA. Of note, Robbins, et.al, limited this meta-analysis to studies of full-time students at four-year institutions in the United States. While the value of these constructs in the four-year setting is noted, further investigation in the two-year setting is needed.

Summary Post-matriculation Risk Assessment

A common approach in assessing student risk of attrition is to study student variables once students are enrolled and interacting with the college environment. Post-matriculation variables in the form of both academic and nonacademic variables are common indictors studied.

Early studies by Astin (1969) examined academic variables post-matriculation. Astin found students most likely to drop out were those with: low high school GPA, no intention of graduate school, low socioeconomic standing, married (either when entering college or while in college). Adelman (1999) found Freshman GPA and trend GPA statistically significant predictors of degree completion for students in four-year institutions. Again in 2006, Adelman results indicated *Academic Resources* as the strongest pre-college indicator and Freshman GPA a strong positive influence of bachelor degree completion. DesJardins, Ahlburg and McCall (1999) found students with high academic performance in college were indeed less likely to stop out.

In the two-year college sector, Webb (1989) found a combined approach of academic (first term GPA) and key variables (external environment, goal commitment, academic intent) resulted in 31 percent of variance in degree persistence. More recently, Sorey and Duggan (2008) found academic integration and Fall GPA to be strong predictors of student persistence. However, Attewell, Heil and Reisel (2010) found academic preparation not a significant predictor of degree attainment for the two-year college population.

Student characteristic variables and those related to goal commitment have proven useful in understanding student persistence post matriculation. DeBarard, Spielmans, and Julka (2004) found statistically significant correlations for several nonacademic variables to GPA (year1). Munt and Merydith (2011-2012) found differences between nonachievers (not academically retained) for nonacademic variables with *Tough-Mindedness,* Self-*Control, Emotional Stability* significantly lower for nonachievers. Cofers and Somers (2001) also found value in post-matriculation nonacademic variables

of student persistence, finding degree aspiration, sophomore status, and full-time status positively related to persistence.

Post-matriculation goal commitment variables were used by Harackiewicz, Barron, Tauer and Elliot (2002) who found achievement goals (i.e. adopted goals from introductory psychology course) had an effect in the short term. However, the effects of goal setting were smaller with the seven year follow up. Robbins, Le, Davis, Lauver, Langley and Langley (2004) found three constructs with the strongest predictive value for college retention to be: academic goals, academic self-efficacy and academic-related skills.

Chapter 3

Research Methodology and Method

The purpose of this study was to examine student variables associated with persistence and program completion to develop a pre-entrance risk assessment in a specific two-year college, using student information readily available to the admission office. The research questions were as follows: (1) *What is the relationship between student attributes known at the time of enrollment and persistence?* (2) *What is the relationship between student attributes known at the time of enrollment and program completion?* (3) *Is there a difference in the persistence of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?* (4) *Is there a difference in the program completion of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?*

This chapter will include the following topics: population, instrumentation, data collection, variable specification, and data analysis used in this study.

Population

The population for this study was entering program students for the 2008-09 academic year at a two-year technical college in the Midwest. The population includes all incoming students who participated in the voluntary intake assessment program (n=1127). For the 2008-09 academic year, 3194 new program students entered with 35.3 percent completing the intake survey. Data from the 1127 students was used for research question one and two. For research question three and four, a subgroup of *at-risk* students was used. Student risk was measured with *The Inventory of Student Success*

instrument. Of the 1127 students completing the survey, 485 (43%) were deemed *at-risk* as a result of low survey scores. The data from this at-risk group was used to answer research question three and four.

The 2008-09 academic year was selected due to the timeframe needed for program completion. Two-year Associate degree students are expected to complete all program requirements within a three year timeframe, (i.e. 150%). This population represents a wide spectrum of occupational programs offered at the two-year technical college (e.g. Accounting, Business Management, Nursing, Information Technology).

Instrumentation

The research was based on existing institutional data. Student data included: (a) standardized college entrance and placement test scores, and (b) results from *The Inventory of Student Success.* The standardized college entrance and placement test scores included The ACT and COMPASS tests. The ACT test is a standardized college entrance test used to evaluate student skill level in English, math, reading and science reasoning. The COMPASS (Computer Adaptive Placement Assessment and Support System) test is a college placement test used to evaluate student skill level in math, writing and reading. Both ACT and the COMPASS test were developed by the American College Testing, (ACT) and are widely used for college admissions. COMPASS testing at this institution occurs in a controlled proctored assessment center.

Student data from the *Inventory of Student Success* (ISS) included scores for: Degree commitment and career commitment variables. These perception questions were measured on a six-point Likert-type scale (1=not true at all, 2=somewhat untrue, 3=slightly untrue, 4=slightly true, 5=somewhat true, 6=completely true). A mean score

was calculated from questions related to degree commitment and converted to percentile ranking within a previous cohort of program students; specifically the mean score of accounting students were ranked with other accounting students, resulting in a score for degree commitment. The same process occurred with questions related to career commitment, thus resulting in a score for career commitment. There were nine perception questions for degree commitment and four perception questions for career commitment as identified in Table 1. These two variables were taken from the fifty-eight item *Inventory of Student Success*, a local instrument used and validated by personnel from the study institution only. The reliability score using Cronbach's Alpha for the *Inventory of Student Success* instrument was .89. The reliability score using Cronbach's Alpha for Career Committment was .84 and .76 for Degree Commitment. Degree Commitment was adapted from the work of Sorey and Duggan (2008) and Career Commitment was adapted from the work of Perry, Cabrera, Vogt (1999).See Appendix A for a copy of the 58 item instrument.

Variable Specifications

This research included two dependent variables both of which were dichotomous (1=yes; 2=no). The variable titled *Semester persistence* indicated that a student re-enrolled each fall and spring term in academic years 2008-09, 2009-10, 2010-11. The variable *Program completion* indicated a student met all program course requirements within three years. A student was categorized a *Drop out* if they voluntarily did not return during the academic years 2008-09, 2009-10, 2010-11.

This research included independent variables as identified in Table 2. Of the 1127 students, 274 (24%) took the ACT test of academic achievement and 853 (76%) took the Computer-Adaptive Placement Assessment and Support System (COMPASS) test,

Table 1

Degree and Career Commitment Questions from the Inventory of Student Success (ISS)

Question	Type
I have found a potential career that strongly attracts me.	Career commitment
My thinking goes around in circles when I try to choose a primary long term occupation.	Career commitment
I have made a firm decision to enter a certain occupation and have begun planning my life around that decision.	Career commitment
I am very confused about what occupation to go into.	Career commitment
I dread the thought of going to school for several more years and there is a part of me that would like to give the whole thing up.	Degree commitment
I plan to transfer to another school sometime before completing a degree at this college or university.	Degree commitment
Of all the things I could do at this point in my life, going to college is definitely the most satisfying.	Degree commitment
I am deeply committed to my educational goals, and I∅m fully prepared to make the effort and sacrifices that will be needed to attain them.	Degree commitment
I am strongly dedicated to finishing college óno matter what obstacles get in my way.	Degree commitment
I have a very strong desire to continue my education, and I am quite determined to finish a degree.	Degree commitment
I wish that society did not put so much pressure on people to go to college, as I∅d really rather be doing other things at this point in my life.	Degree commitment
I can think of many things I would rather do than go to college.	Degree commitment
I often wonder if a college education is really worth all the time, money and effort that I∅m being asked to spend on it.	Degree commitment

designed to assess math, reading and writing skills. For students who took the ACT, a

predicted score was set using the concordance conversion to the COMPASS scale of 1-99

(ACT, 2010). The variable *Degree commitment* was a percentile ranking between 0-100

indicating the percent of cases falling at or below, for responses to perception questions

from *The Inventory of Student Success* (ISS). The variable *Career commitment* was a

percentile ranking between 0-100 indicating the percent of cases falling at or below, for

responses to perception questions from the same instrument. The variable *enrollment*

status indicated part-time or full-time credit load with full-time status equating to twelve

or more credits and part-time status equating to less than twelve credits. The variable

financial aid status indicated whether a student received financial aid assistance to attend

college. The variable *early integration* indicated if the student participated in college

support services during their first term of enrollment including counseling, tutoring, and

or developmental education.

Table 2

Independent Variables

Variable	Type	Coding
COMPASS score		
Pre-algebra	Interval	1-99
Algebra	Interval	1-99
Reading	Interval	1-99
Writing	Interval	1-99
ISS item		
Degree commitment	Interval	0-100
Career commitment	Interval	0-100
Demographic factors		
Student age	Interval	15-99
Gender	Dichotomous	1=male, 2=female
Situational factors		
Enrollment status	Dichotomous	1=fulltime, 2= part-time
Financial aid status	Dichotomous	1=yes, 0=no
Early integration	Dichotomous	1=yes, 0=no

Data Collection

This research used an existing dataset. Data were retrieved from the student information system within the enterprise system by college personnel. Permission to access the data was granted by the Institutional Review Board (IRB) at the study institution (see Appendix B). The IRB from the research institution also approved the study (see Appendix C). Student identification was coded removing personal identifiable information, preserving student confidentiality. Data were stored within the institution's information network following standard operating procedures.

Data Analysis

All statistical operations were conducted using SPSS statistical software version 20 (2012). To answer the research questions in this study, data analysis included descriptive statistics (n, mean, standard deviation). To answer research questions (1) *What is the relationship between student attributes known at the time of enrollment and persistence?* and (2) *What is the relationship between student attributes known at the time of enrollment and program completion?,* binary logistic regression was used. Because the two dependent variables (i.e. semester persistence, program completion) are dichotomous (yes/no), binary logistic regression was used (Pedhazur, 1997). In the present study, the independent variables were either interval and dichotomous. Beginning with the dependent variable persistence, each independent variable was added to the model to determine if the variable increased the ability to predict persistence. This process was repeated for program completion as the second dependent variable.

Odds comparisons were used to answer research question (3*) Is there a difference in the persistence of at-risk students, who participate in early integration programming,*

and at-risk students who do not participate in early integration programming? and

research question (4.) *Is there a difference in program completion of at-risk students, who*

participate in early integration programming, and at-risk students who do not participate

in early integration programming? Kirkwood and Sterne (2003) recommended the use

of odds in measuring differences in groups. Specifically, odds identifies whether or not

there is a difference in the odds a student will persist or complete, for those that

participate in early integration and those that do not. The odds were drawn from binary

logistic regression analysis.

Chapter 4

Results

The purpose of this study was to examine student variables associated with persistence and program completion to develop a pre-entrance risk assessment in the two-year college setting, using student information readily available to the admission office. These results are separated into two sections under the sub-headings: (a) Persistence and Completion, and (b) Participation in Early Integration. The sub-heading (a) Persistence and Completion presents the results of research questions (1) *What is the relationship between student attributes known at the time of enrollment and persistence?,* and research question *(2) What is the relationship between student attributes known at the time of enrollment and program completion?* These results are drawn from the total population (n=1127) of this study. The population was entering program students for the 2008-09 academic year at a two-year technical college in the Midwest. The population includes all incoming students who participated in the voluntary intake assessment program (n=1127). For the 2008-09 academic year, 3194 new program students entered with 35.3 percent completing the intake survey.

The sub-heading (b) Participation in Early Integration presents the results of research questions (3) *Is there a difference in the persistence of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?,* and research question (4) *Is there a difference in program completion of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?* These results are drawn from a subgroup of at-risk students (n=485). This subgrouping occurred

because the results of research question one and two were not as expected and an

alternate method was used to measure student risk of attrition.

First, descriptive statistics for the independent variables are identified in Table 3.

The academic variables for this study included four categories: PreAlgebra, Algebra,

Reading, and Writing. Each category ranges from 1-99 with the mean (*M*) average score

presented. Students may, or may not, have a recorded score for each academic category

resulting in differences in the *n* for each category. Variables from the *Inventory of*

Student Success included: Degree commitment and Career Commitment. These two

variables were taken from the fifty-eight question college entrance survey. The mean

score was 46.75 for Degree Commitment and 45.68 for Career Commitment. Student

demographic variables included age and gender. The mean age for this population was 27

years. The gender mix included 38.5% male and 61.5% female. Situational factors

included enrollment status, and financial aid status. Results indicate this cohort included

65.8% part-time students and 34.1% full-time students. Financial aid was issued to 77.7%

of the students with 22.2% not receiving any aid. Student outcomes for this study include

four categories. Student persistence was defined as a student's re-enrollment in the

following term. Results revealed 17 % of the students continued as semester persisters.

Program completion was defined as students' completion of program requirements.

Results revealed 21.1% of the students completed their program within the three year

timeframe. Stop out referred to students who experienced temporary interrupted

enrollment. Results revealed 10.2% of the students stopped out. Drop out referred to

students who left voluntarily and did not return to the institution within three academic

years. Results revealed 61.8% of the students dropped out. Student outcome categories

were not mutually exclusive as a student could be classified as a stop out and a semester

persister, or a program completer. These results are depicted in Table 3.

Table 3

Descriptive Statistics

Variable	*n*	%	*M*	*SD*
Academic preparation				
PreAlgebra	989		55.56	20.62
Algebra	514		32.72	15.31
Reading	971		83.71	12.67
Writing	805		70.86	25.28
ISS variables*				
Degree commitment	1127		46.75	27.85
Career commitment	1127		45.68	25.96
Demographic factor				
Age	1127		27	8
Gender				
Male	434	38.5		
Female	693	61.5		
Situational factor				
Enrollment status				
Full time	385	34.1		
Part time	742	65.8		
Financial Aid status				
Yes	876	77.7		
No	251	22.2		
Student outcome				
Semester persistence	192	17.0		
Program completion	238	21.1		
Drop out	697	61.8		

Note. *ISS variables denotes items from the Inventory of Student Success (ISS) voluntary intake survey

Persistence and Completion

The total population (n=1127) of this study was used to answer research question

one and two. This population included all incoming students who participated in the

voluntary intake assessment program (n=1127).

Research Results for Question 1

The first research question was: *What is the relationship between student attributes known at the time of enrollment and persistence?* Binary logistic regression was used to examine the relationship between variables, specifically to determine if any one of the independent variables, or combinations, is attributed or associated to student persistence. To evaluate the amount of explained variance (i.e. association to student persistence), Cox & Snell's pseudo R-square value was used. The alpha level was held to the $p \le .05$ level. The alpha level is the statistical probability that the size of the effect observed could be due to chance or Type I error. Persistence was introduced as the dependent variable and all academic independent variables (i.e. Pre-Algebra, Algebra, Writing, and Reading) were introduced into the model. Next, nonacademic variables (i.e. degree commitment, career commitment, age, gender, enrollment status, financial aid status) were examined to determine their association with persistence.

The results in Table 4 reveal each predictor variable along with: (a) the Chi-square value (x^2), (b) the p value associated with the test; (c) the Cox & Snell pseudo R-square, giving an indication for the amount of explained variance (i.e. association to persistence) for each. Results indicate the Algebra and Reading variables were statistically significant but the amount of variance was relatively small (.024, .010) respectively. So, while statistically significant, Algebra scores explained 2% of the variance and Reading scores explained less than 1 % of the variance in persistence. The Nonacademic variables of Degree Commitment, Career Commitment, and Financial Aid status were statistically significant with the amount of explained variance small (.012, .008, .011) respectively. Table 4 illustrates these results.

Research Results for Question 2

The second research question was: *What is the relationship between student attributes known at the time of enrollment and program completion*? Binary logistic regression was used to examine the relationship between variables, specifically to determine if any one of the independent variables, or combinations, was attributed or associated to program completion. To evaluate the explained variance (i.e. association to student persistence), Cox & Snell pseudo R-square value was again used. The alpha level was held to the p Ö.05 level. Program completion was introduced as the dependent variable and all academic independent variables (i.e. Pre-Algebra, Algebra, Writing, and Reading) were introduced into the model. Next, nonacademic variables (i.e. degree commitment, career commitment, age, gender, enrollment status, financial aid status) were added to the model. The results in Table 4 reveal each predictor variable along with: (a) the Chi-square value (²), (b) the *p* value associated with the test;

Table 4

Binary Logistic Regression Results

Predictor	Persistence			Program completion		
	²	*p*	Cox Snell R²	²	*p*	Cox Snell R²
PreAlgebra	1.526	.217	.002	.664	.415	.001
Algebra	27.754	.000***	.024	1.159	.282	.001
Writing	2.562	.109	.003	4.735	.030*	.005
Reading	10.298	.001***	.010	.000	.993	.000
Degree Commitment	13.356	.000***	.012	.000	.984	.000
Career Commitment	8.810	.003**	.008	.060	.807	.000
Age	2.139	.144	.002	.071	.790	.000
Gender	.044	.834	.000	1.462	.227	.001
Enrollment status	.283	.595	.000	.519	.471	.000
Financial aid status	11.947	.001***	.011	5.504	.019*	.005

* p < .05. ** p < .01. ***p < .001.

(c) the Cox & Snell pseudo R-square, giving an indication for the amount of shared variance.

The results in Table 4 reveal differences in the probability for program completion. The academic variable of Writing was statistically significant though the amount of variance was small (.005). The variable of Financial Aid status was the only statistically significant nonacademic variable, however the amount of variance was small (.005).

<div align="center">

Participation in Early Integration

</div>

A subgroup of the total population was used to answer research question three and four. These results are drawn from a subgroup of at-risk students (n=485). This subgrouping occurred due to the results of research question one and two being not as expected and an alternate method was applied to measure student risk of attrition.

Research Results for Question 3

The third research question was: *Is there a difference in the persistence of at-risk students who participated in early integration programming and at-risk students who did not participate in early integration programming?* To answer research question 3, a subgroup of at-risk students was used (n=485). This subgrouping occurred due to the results of research question one and two being not as expected and an alternate method was applied to measure student risk of attrition, thus risk was measured with *The Inventory of Student Success* instrument. There were 485 students deemed *at-risk*. Of those *at-risk* students, 160 students participated in the early intervention program. Thirty-two (32) who participated in early intervention subsequently persisted (i.e. re-enrolled the

following term). The difference in odds is used for research question 3. Specifically, is

there a difference in the odds a student will persist for the students that participate in

early integration, and those that do not. The odds were drawn from binary logistic

regression analysis. The student groups are illustrated in Table 5.

Table 5

At-Risk Student Group with Early Integration Persistence

Group	n	%
Student cohort	1127	
At-risk students	485	43.0
Participants with early integration	160	32.9
Participants without early integration	325	67.0
Early Integration Persisters	32	20.0

It was expected that participation in the early intervention would improve the

overall chance of persistence. However, the expected value (i.e., expected cell frequency)

was 36 (or 35.96) students would have persisted but only 32 persisted. Participation in

early intervention did not have the impact expected as noted in Table 6.

Of the at-risk students, 325 did not participate in the early intervention program.

Two hundred and forty eight (248) students chose not to participate in the early

intervention program and did not subsequently persist. However, the expected value, is

that 252 students would not be expected to persist. The odds of persisting were .4156 or

41.5% (32/77) for those participating in the intervention group. The odds of persisting

and participating in the early intervention were less than fifty percent. In contrast, the

odds of persisting for those not participating in the early intervention were .5161 or

51.6% (128/248). However, the two-tailed Fisher Exact Probability value was not

statistically significant x^2 (1 *df*) = 2.34, significant p. = 0.418. These results are depicted

in Table 6.

Table 6

Odds of Semester Persistence with Early Integration

Category	Non Risk	At-Risk	Total	Odds
	n	*n*		
Persistence				
Actual	77	32	109	.4156
Expected	73	36		
No Persistence				
Actual	248	128	376	.5161
Expected	252	124		
Actual total	325	160	485	

Note. Expected values are rounded to the nearest whole number.

Research Results for Question 4

The fourth research question was: *Is there a difference in program completion of*

at-risk students who participate in early integration programming and at-risk students

who do not participate in early integration programming? To answer research question

4, a subgroup of *at-risk* students was used (n=485). This subgrouping occurred due to the

results of research question one and two being not as expected and an alternate method

was applied to measure student risk of attrition, thus risk was measured with *The*

Inventory of Student Success instrument. There were 485 students deemed *at-risk* in this

study sample. Of those, *at-risk* students, 160 students participated in the early

intervention program. Twenty nine (29) who participated in early intervention

subsequently completed their program. The difference in odds is used for research

question 4. Specifically, is there a difference in the odds a student will complete for the

students that participate in early integration, and those that do not. The odds were drawn

from binary logistic regression analysis. This is illustrated in Table 7.

Table 7

At-Risk Student Group with Early Integration Program Completion

Group	n	%
Student cohort	1127	
At-risk students	485	43.0
Early integration participants	160	32.9
Early Integration Program completers	29	18.1

It was expected that participation in the early intervention would improve the

overall chance of program completion. However the expected value (i.e., expected cell

frequency) was 33 students would have completed their program but only 29 completed.

Table 8 illustrates these findings.

Table 8

Odds of Program Completion with Early Integration

Category	Non Risk n	At-Risk n	Total	Odds
Complete				
Actual	71	29	100	.4085
Expected	67	33		
Did not complete				
Actual	254	131	385	.5157
Expected	258	127		
Actual total	325	160	485	

Note. Expected values are rounded to the nearest whole number.

Participation in early intervention did not have the impact expected. Of those at-risk students, 325 did not participate in the early intervention program. Two hundred and fifty four (254) students chose not to participate in the early intervention program and subsequently did not complete. However, the expected value is that 258 students would not be expected to complete. The odds of completing were .4085 or 40.8% (29/71) for those participating in the intervention group. The odds of completing for those not participating in the early intervention were .5157 or 51.5% (131/254). The two-tailed Fisher Exact probability value was not statistically significant x^2 (1 df) = .340, significant p. = 0.403. Table 8 illustrates these findings.

CHAPTER 5

Discussion

The purpose of the study was to examine student variables associated with persistence and program completion to develop a pre-entrance risk assessment in a specific two-year college setting, using student information readily available to the admission office. Therefore the research questions were as follows:

1. What is the relationship between student attributes known at the time of enrollment and persistence?

2. What is the relationship between student attributes known at the time of enrollment and program completion?

3. Is there a difference in the persistence of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?

4. Is there a difference in program completion of at-risk students who participate in early integration programming and at-risk students who do not participate in early integration programming?

A discussion of findings for each research question is included in this chapter. This chapter is divided into four subject areas: (a) Discussion of findings, (b) Implications for practice, (c) Implications for research, (d) Recommendations.

Discussion of Findings

The most salient finding of this study was that student attributes known at the time of enrollment did not have a notable relationship with student persistence or program completion for this two-year college population.. The results of this study

identified five variables that were statistically significant in contributing to the variance in persistence and two that were statistically significant in contributing to the variance in program completion.

Results from research question one reveal Algebra and Reading variables, along with the Academic omnibus test (i.e. all academic variables) were statistically significant for persistence. Algebra and Reading account for 3% of the variance in persistence. The variables of Degree Commitment, Career Commitment, and Financial Aid status were statistically significant; however, these variables only explained a small amount of the variance in persistence (i.e. 1% each). Results indicate the likelihood of persisting increases with better academic preparation, however these variables only account for 3% of the variance in persistence. Similarly results indicate the likelihood of persisting increases with higher scores in Degree Commitment, Career Commitment and for those students with Financial Aid; however, these variables explain a small amount of the variance in persistence (i.e. 1% each). Results for research question two also revealed a small predictive power for academic variables.

Results from research question two indicate the Writing variable was statistically significant for program completion, however accounted for less than 1% of the variance. Similar to the outcome of persistence, the Academic omnibus test was significant though only accounted for 1% of the variance. The variable of Financial Aid status was the only statistically significant nonacademic variable and accounted for less than 1% of the variance. Results indicate the likelihood of program completion increases slightly with better academic preparation, accounting for 1% of the variance. Similarly results indicate the likelihood of program completion increases for students receiving Financial Aid,

accounting for 1% of the variance. Unfortunately, no other combination variables yielded a stronger model. These results were not as expected. It was expected that academic and nonacademic variables would account for a higher percent of the variance for persistence and program completion.

Findings from research question one and two were consistent with the literature. Attewell, Heil and Reisel (2010) also found academic preparation (HS GPA, SAT, highest math) was not a significant predictor of degree attainment for students entering community or two-year colleges, as confirmed in this present study. DesJardins, Ahlburg and McCall (1999) found the strength of academic variables as predictors to persistence weakens over time with weaker association in year two, three, four and five. While the academic variables may have predictive power for first term persistence, the association with long term persistence as noted in this present study, is less.

Findings from research question one and two were counter to prior research in the two-year college setting which indicated academic preparation was associated with long-term enrollment and degree outcomes. Porchea, Allen, Robbins, and Phelps (2010) found evidence indicating the likelihood of degree attainment and transferring to a four-year university increased with better academic preparation (i.e. higher test scores). They also found Academic Discipline, Commitment to College and age were significantly predictive of degree attainment. These findings are counter to the present study and could be attributable to differences in populations. While Porchea, et al. did examine the two-year college setting, their multi-institutional study included a mix of 78% community college and 22% technical college. This difference in distribution could account for the difference in results with the present study.

The findings from this study indicate isolating predictors of student persistence and program completion in the two-year college setting is more complex than expected. This complexity is attributed to the population served in this setting. Risk assessment strategies that work for the four-year setting may not have an application in the two-year setting.

Results for research question one revealed five variables were statistically significant in contributing to the variance in persistence and results from research question two revealed two variables were statistically significant in contributing to the variance in program completion. However, these variables accounted for a small amount of the variance. Based on these results, pursuing the development of a pre-entrance risk assessment was not of value for this specific two-year college setting. In light of this, an alternate measure of risk was adopted to pursue research question three and four. The alternate risk measurement was gleaned from the local *Inventory of Student Success* instrument used since 2007 at this institution with 71 percent accuracy in measuring attrition. Analysis in 2012 confirmed the instrument was 71 percent accurate in predicting student who attrite according to Phil Palser, Assessment Manager (personal communication, January 7, 2013).

Prior research in four-year public and private institutions did reveal relationships between student attributes known at the time of enrollment and student persistence supporting the development and use of a risk assessment. In a public four-year institution, Singell and Waddell (2010) did find differences in probability to persist associated with entrance attributes for first time, fall only entering students supporting the development of a risk assessment. They found several student attributes associated with persistence

including gender, SAT, and financial aid though admitted the strength of association for

SAT was greatly reduced for long term retention. In a private four-year institution Glynn,

Sauer and Miller (2003) also found pre-matriculation data useful in identifying student

risk for attrition with incoming freshman. They found student background variables (i.e.,

age, gender, parental education, residency, parental marital status, high school GPA)

along with goal commitment variables from student attitude survey revealed a predictive

validity of 83% (percent of students correctly classified).

In this present study, attributes known at the time of enrollment were not notably

associated with persistence or program completion and therefore did not support the

development of a risk assessment. The differences between the student population in a

four-year and two-year college setting (NCES, 2011) may be a possible explanation.

Public and private four-year universities have a selective admission process and can

adjust admission criteria creating a homogenous student population with similar attributes

found with incoming students. The present study examined the two-year college setting

with an open access mission, accepting all applicants regardless of student characteristics.

This diverse population is a heterogeneous mix in age, academic preparedness, financial

need and enrollment status, ripe with risk factors for attrition. With so many risk

variables, no single independent variable accounted for a notable portion of the variance

to persist or complete. No notable relationship was found between student attributes

known at the time of enrollment and persistence or program completion, eliminating the

pursuit of a risk assessment. I submit all students entering this two-year college have risk

for attrition at one level or another. Further support for this claim can be found in the 61.8

% drop out rate for this cohort. The notion of treating all incoming students entering this two-year college, as if a high risk for attrition exists, has merit.

Results from research question three revealed at-risk students who did participate in the early intervention program had lower odds for persistence. The odds of persisting were lower (i.e., 41.5%) for those participating in the intervention group, compared to the odds of persisting and not participating in the early intervention (i.e., 51.6%). The direction of the data is not as expected. The findings were not statistically significant.

Results from research question four revealed at-risk students who did not participate in the early intervention program had lower odds for program completion. The odds of completing were lower for those participating in early integration (i.e., 40.8%), compared to the odds of completing and not participating in the early intervention (i.e., 51.5%). These findings were not statistically significant.

The results for research question three and four were surprising and not as expected. Participating in the early intervention program did not increase the odds of persisting or completing. Participation was associated with lower odds of persisting and completing. The findings were not statistically significant, however still surprising. One possible explanation is the perceived barrier the early interventions represent to the student. During the interventions, students may realize the length and weight of the road before them. Their intervention plan may include extra developmental education courses, extra peer tutoring requirements and additional counseling sessions. Students may not view this as a support service; rather students may perceive this extra support as a burden. Students may view this requirement as a burden which consumes more of their precious time and financial resources. This realization may be a trigger for attrition.

The sample for this study was entering program students for the 2008-09 academic year at a two-year technical college in the Midwest. The cohort included all incoming students who participated in the voluntary intake assessment program (n=1127). For the 2008-09 academic year, 3194 new program students entered with 35.3 percent completing the intake survey. This limitation may account for the unexpected findings. Differences between this cohort and the 64.7% of incoming students who did not participate in the voluntary intake program should be explored in a future study to understand if differences between these groups may explain these unexpected findings.

Implications for Practice

As a practical matter, these results are relevant and pertinent to community college administrators. In general, results of this study illustrate the high risk of attrition community college studentsøface. Community College Administrators can use this information to enhance and expand attrition prevention programs for incoming students. Administrators can consider their entering students at-risk and triage them to support services proactively as a matter of standard practice. Administrators can assume the majority of the students are at-risk and could benefit from proactive support services such as mandatory orientation programs. In addition, continued student support through *Student Success Seminars* should continue as these venues allow student and staff to interact early in the college experience and builds awareness of the unique characteristics of this student population.

Results from research question one and two revealed weak predictive power for academic and nonacademic variables. While these variables are weak predictors for persistence and program completion, they have a practical value and should continue to

be used to triage students until future research can identify new variables with stronger

predictive value. While 2% of the explained variance is weak, it is the highest predictor

that is known at this time. Use of a weak predictor to triage students is better than random

selection to triage students until a stronger predictor can be isolated.

Existing student risk assessments, currently employed by colleges should continue to be

used until a pre-entrance risk assessment can be developed for the two-year college

setting. These existing assessments have a local value and benefit related to student

engagement.

      Findings from this study suggest college entrance scores have minimal association

with persistence or program completion in this two-year setting and therefore, should not

be used as a proxy for expected persistence or program completion. College admission

requirements with primary emphasis on college entrance exam scores are not valid

measures to solely determine college persistence or completion potential and should not

be used in that way.

      Results from research question three and four revealed a decrease in odds with

early integration for persistence and program completion. Implications for practice do

exist for research question three and four. First, early integration services should continue

while the design of the program is examined. The early integration experience is an

opportunity for students to engage in the college environment and the benefit may not be

measurable, but should continue. An analysis of the program design would determine if

student perceptions of the program are negative. If a negative perception exists, a new

design may be needed. In the case of developmental education, redesigning the course

sequence and length of the courses may have merit. Rather than placing a full term of

developmental education courses on the academic plan for a particular student, administrators could consider a compressed design (Bailey, 2009). A compressed design includes a cohort of students scheduled in an intensive eight week developmental course followed by the next general education course in their sequence also offered as an eight week course. This design allows the student to advance through their developmental education courses at a faster rate. This approach may influence student perceptions of the obstacles before them and reduce the risk of attrition.

Implications for Research

The need for a risk assessment for the two-year college setting still exists and therefore future studies are recommended. Future studies should isolate student subsets in an attempt to establish homogeneity within the cohort, such as examining only first time students or only full-time students. It is expected this may reduce the number of risk variables and strengthen the predictive power for those variables. Additionally, building on Adelman's (2006) research, future studies should include variables for course withdrawals, no-credit repeats, and summer credits as additional variables to examine student enrollment patterns and the association with persistence and program completion. It is recommended that future studies to develop a risk assessment include variables collected during the first term. While a pre-entrance risk assessment is ideal for triaging student support services early, assessing risk during the first term of college would also be beneficial. Additional variables during the first term, such as level of student engagement in course work, faculty interactions, and student attendance have proven beneficial in previous studies. Moving in the direction of Kuh's (2005) research to include these variables may have value in assessing risk of attrition during the first term.

Using this information to develop a first term risk assessment would allow time for directed intervention. Collecting and synthesizing this information early in the first term could direct student support services toward the student proactively. Glynn, Sauer and Miller (2003) did find student survey data collected early in the college experience increased the predictive strength of their model. This approach may benefit students in the two-year college setting.

Using the freshmen experience to gather more information would inform future research in other ways as well. This approach would also lend itself to include first term GPA as prior studies (Webb, 1989) do indicate this academic variable is associated with degree persistence in the two-year college setting. Friedman and Mandel (2011-2012) found student motivational predictors (i.e. student achievement, affiliation, autonomy and dominance) measured through the Needs Assessment Questionnaire (NAQ) held a positive relationship with retention in the first year of college in the four year setting. A first term student risk assessment encompassing variables outlined above may provide answers to student risk variables to inform and direct proactive student support services.

Results from research question three and four revealed a decrease in odds with early integration for persistence and program completion. Implications for research do exist for research question three and four. It is recommended that an analysis of the program design be undertaken to determine if student perceptions of the program are negative. If a negative perception exists, a new design may be needed, such as those proposed by Bailey (2009) to compress the developmental education courses. Additional research is also recommended for at-risk student involvement in early intervention programming. Accepting that all incoming students have some level of risk

in the two-year college setting, only 30% of this cohort participated in the early integration programing in the present study. Clearly this is a missed opportunity to interact with students.

It is recommended that future studies examine intervention effectiveness and at-risk student participation. Astin's (1975) *Theory of Involvement* and Tinto's (1975) *Theory of Individual Departure* suggest students actively involved in their learning experience, and those interacting with the learning environment are more likely to persist. However, if at-risk students are not interacting early by participating in the interventions during their first term, the effectiveness of the interventions is only half the problem.

Recommendations

It is recommended the *Inventory of Student Success* continue to be used as a risk assessment while other risk assessments are examined. Student perception questions such as those within the variables of Degree Commitment and Career Commitment found on *The Inventory of Student Success* have a student impact that is not easily measured, yet provides a practical significance. By completing a perceptions survey, students engage in an exchange with the college and its staff. This act of sharing their perceptions on particular topics can create a link between the student and the college. Students can sense the college is interested in their perceptions and intent to learn more about the student. As the student discusses their results with support staff, student engagement occurs and the relationship strengthens. Students learn about services available through these interactions and the bond between the student and college strengthens. This act has a value to both the student and the college and therefore, student perception question surveys should continue.

It is recommended that attention be placed on the development of a risk assessment for this two-year college setting to include variables collected during the first term. First term GPA, student attendance and student engagement should be included to examine their value in measuring student risk. If evidence does confirm a predictive power, it is recommended these element comprise a standard first term risk assessment to direct student support services to the student during the first term.

Results from research question three and four revealed a decrease in odds with early integration for persistence and program completion. While these results are not as expected, early integration should continue at this college. It is recommended that early integration services continue while the design of the program is examined. The early integration experience is an opportunity for students to engage in the college environment and the benefit may not be measurable, but should continue. A compressed design may be needed to reduce the perceived burden. A student perceptions survey of the early integration program is recommended in addition to program effectiveness research.

This study did bring clarity to these important research questions; however, more research is needed to further understand variables attributed to student persistence and program completion for this vulnerable population. Assessing student risk of attrition early will help to triage students toward interventions, a necessary action for this at-risk population. The need to develop a pre-enrollment, or first term risk assessment continues. Once developed, this early assessment will be key to triage students toward interventions.

References

Adelman, C. (1999). *Answers in the toolbox: Academic intensity, attendance patterns, and bachelor's degree attainment*. Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement. Retrieved from http://www2.ed.gov/pubs/Toolbox/Part4.html

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

American College Testing Program, (2011). ACT Brief. *National Collegiate Retention and Persistence to Degree Rates.* Retrieved from http://www.act.org. Concordant ACT, COMPASS, and ASSET scores, (2010). ACT Information Brief. Retrieved from http://www.act.org.

Astin, A.W. & Panos, R.J. (1969). *The educational and vocational development of college students.* Washington, D.C.: American Council on Education.

Astin, A.W. (1971). *Predicting academic performance in college*. New York, N.Y.: Macmillion.

Astin, A. W. (1975). *Preventing students from dropping out*. San Francisco, CA: Jossey-Bass.

Astin, A.W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel, 25*, 297-308.

Astin, A. W. (1999). Student involvement: A development theory for higher education. *Journal of College Student Development*, 40(5), 518-529.

Bailey, T. (2009). Challenge and Opportunity: Rethinking the role and function of

developmental education in Community Colleges. *New Directions for Community*

Colleges. 145, 11-30.

Baumgart, N. & Johnstone, J. (1977). Attrition at an Australian university: A case study.

Journal of Higher Education, 48(5), 553-570.

Bean, J. & Eaton, S.B. (2001-2002). The psychology underlying successful retention

practices. *Journal of College Student Retention, 3*(1), 73-89.

Bean, J.P. & Metzner, B.S. (1985). A conceptual model of nontraditional undergraduate

performance and attrition. *Journal of Higher Education*, *55*, 485-540.

Braxton, J., Hirschy, A., & McClendon S. (2004). *Understanding and reducing college*

student departure. Hoboken, NJ: Wiley Periodicals, Inc.

Braxton, J., Sullivan, A., & Johnson, R. (1997). *Appraising Tinto's Theory of College*

Student Departure. In J.C. Smart (ed.) Higher education: A handbook of theory

and research, vol12, pp. 107-164. New York: Agathon Press.

College Board. (2010). *Report of Education Pays*. Retrieved from

http://www. //trends.collegeboard.org/education_pays.html.

DeBarard, M., Spielmans, G., & Julka, D. (2004). Predictors of Academic Achievement

and Retention among College Freshman: A longitudinal study. *College Student*

Journal, 38(1), 66-80.

Friedman, B., & Mandel, R. (2011-2012). Motivation predictors of college student

academic performance and retention. *Journal of College Student Retention*. 13(1).

1-15.

Glynn, J., Sauer, P., & Miller, T. (2003). Signaling student retention with pre-matriculation data. *National Association Student Personnel Administrators, 41*(1), 41-67.

Halpin, R. (1990). An application of the Tinto model to the analysis of freshmen persistence in a community college. *Community College Review*, *17*(4), 2two-32.

Hirschy, A., Bremer, C.,& Catellano, M. (2011). Career and technical education (CTE) student success in community colleges: A conceptual model. *Community College Review, 39*(3), 296-318.

Hurlburt, S. & Kirshstein, R. (2012). *Spending: Where Does the Money Go?* Washington, DC: American Institutes for Research. Retrieved from http://www.deltacostproject.org/DeltaSpendingTrendsProduction.

Johnson, N. (2012). *The Institutional Costs of Student Attrition*. Washington, DC: American Institutes for Research. Retrieved from http://www.deltacostproject.org/DeltaCostAttritionResearchPaper.

Kirkwood, B., & Sterne, J. (2003). *Essential medical statistics*. (2nd ed.). Oxford: Blackwell Publishing.

Kuh, G., (2005). Student engagement in the first year of college. In *Challenging and supporting the first year student: A handbook for improving the first year of college*. Edited by M. Upcraft, J. Gardner, B. Barefoot. 86-107. San Francisco: Jossey Bass.

McDermott, M. L. (2007). *The relationship between suspension and subsequent student success*. (Doctoral dissertation). Retrieved from ProQuest. (304842491).

Metzner, B.S. & Bean, J.P. (1987). The estimation of a conceptual model of

nontraditional undergraduate student attrition. *Research in Higher Education*,

27(1), 15-38.

Mortenson, T.G. (2005). Measurements of Persistence. In A. Seidman (Eds), *College*

student retention: *Formula for student success.* (pp.31-60). Westport: Praeger

Publishers.

Munt, J., & Merydith, S., (2011-2012). The Relationship of StudentsøPersonality Traits

and Psychosocial Characteristics with Academic Retention. *Journal College*

Student Retention, 13(4), 457-478.

Murtaugh, P., Burns, L., Schuster, J. (1999). Predicting the Retention of University

Students. *Research in Higher Education*, 40(3), 355-371.

National Center for Education Statistics (2001). *A classification system for Two-year*

postsecondary institutions. Retrieved from http://www.nces.ed.gov.

National Center for Education Statistics (2008). *Characteristics of postsecondary*

*students.*Retrieved from http://nces.ed.gov.

National Center for Education Statistics (2011).*2008-09 Baccalaureate and Beyond*

Longitudinal   Study. Retrieved from http://nces.ed.gov.

National Center for Education Statistics (2011). *The condition of education 2011.*

Retrieved from http://www.nces.ed.gov.

Panos, R.J. & Astin, A.W. (1968). Attrition among college students. *American Education*

Research Journal. 5(1), 57-72.

Parnell, D. (1985). *The neglected majority*. Washington: Community College Press.

Pascarella, E., & Chapman, D. (1983). A multi-institutional, path analytic validation of

Tintoǿs model of college withdrawal. *American Educational Research Journal*,

20(1), 87-102.

Pascarella, E., & Terenzini, T. (1979b). Interactive influences of Spadyǿs and Tintoǿs

conceptual models of college dropout. *Sociology of Education*. 52(4). 197-210.

Pascarella, E. & Terenzini, P. (1980). Predicting freshmen persistence and voluntary

dropout decisions from a theoretical model. *Journal of Higher Education*. *51*(1).

60-75.

Pascarella E., & Terenzini, P. (1991). *How college affects students*. San Francisco:

Jossey-Bass.

Pascarella E.T., & Terenzini, P.T. (2005). *How college affects students*: *A third decade of

research.* San Francisco: Jossey-Bass.

Pedhazur, E. (1997). *Multiple Regression in Behavior Research: Explanations and

predictions*. (3rd ed.) New York: Harcourt Brace.

Perry, S., Cabrera, A., & Vogt, W. (1999). Career Maturity and College Student

Persistence. J*ournal of College Student Retention*. 1(1), 41-58.

Peterson, S. (1993). Career decision-making self-efficacy and institutional integration of

underprepared college students. *Research in Higher Education* 34(6), 659-685.

Porchea, S., Allen, J., Robbins, S., & Phelps, R., (2010). Predictors of Long-Term

Enrollment and Degree Outcomes for Community College Students: Integrating

Academic, Psychosocial, Socio-demographic, and Situational Factors. *The

Journal of Higher Education*. 81(6). 750-778.

Reason, R. (2009). An Examination of Persistence Research through the Lens of a

   Comprehensive Conceptual Framework. *Journal of College Student Development*.

   50(6), 659-682.

Schneider, M. (2010). *Finishing the first lap: The cost of first-year student attrition in*

   America's four-year colleges and universities. Washington, DC: American

   Institutes for Research. Retrieved from

   http://www.air.org/files/AIRSchneiderFinishingtheFirstLap.

Sedlacek, W. (2003). Alternative admissions and scholarship selection measures in

   higher education. *Measurement and Evaluation in Counseling Development*, *35*,

   263-272.

Seidman, A. (2005). *College student retention: Formula for student success*. Westport:

   Praeger Publishers.

Singell, L., & Waddell, G. (2010). Modeling retention at a large public university: Can

   at-risk students be identified early enough to treat? *Research in Higher Education*,

   51(6), 546-572.

Terenzini, P. & Pascarella, E. (1977). Voluntary freshman attrition and patterns of social

   and academic integration: A test of a conceptual model. *Research in Higher*

   Education. 6(1) 25-43.

Terenzini, P. & Pascarella, E. (1978). The relation of studentsøprecollege characteristics

   and freshman year experience to voluntary attrition. *Research in Higher*

   Education. 9(4), 337-366.

Terenzini, P. & Reason, R. (2005, November). *Parsing the first year of college: A*

   conceptual framework for studying college impact. Paper presented at the Annual

Conferences of the Association for the Study of Higher Education, Philadelphia, PA.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, *65* (winter), 89-125.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago:The University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. (2nd ed.) Chicago: The University of Chicago Press.

Tracey, T.J., & Sedlacek. W.E. (1984). Non-cognitive variables in predicting academic success by race. *Measurement and Evaluation in Guidance*, *16*, 171-178.

U.S. Bureau of Labor Statistics (2010). Current Population Survey. Retrieved from www.bls.gov/emp/ep_chart_001.htm.

Voorhees, R. (1987). Toward building models of community college persistence: A logit analysis. *Research in Higher Education, 26*(2), 115-129.

Webb, M. (1989). A theoretical model of community college student degree persistence. *Community College Review, 16*(4), 42-49.

Appendix A
Inventory of Student Success

CVTC INVENTORY of STUDENT SUCCESS	First Name	Last Name
Student ID:		
Program Applying for:	Birth Date:	

The inventory provides an important private communication channel between you and CVTC. It records your thoughts and feelings on many issues related to college. Results for your class as a whole will be used to plan campus-wide programs of support services. Staff members will determine how much need exists for certain types of services and how these services can be best provided. Please darken in one response circle for each item. Use a pencil so you can erase to change a response, if needed.

My graduating class in high school had:
- less than 50 students
- 50 to 99 students
- 100 to 149 students
- 150 to 299 students
- 300 to 499 students
- 500 or more students
- I received a General Education Degree (G.E.D.)

The average of all my grades during my senior year in high school was approximately:
- A
- halfway between A and B
- B
- halfway between B and C
- C
- halfway between C and D
- D

While attending college, I am living in (or plan to live in):
- a residence hall
- my parents' home
- a relative's home
- my own off-campus apartment or house
- other

If attending CVTC full time, the amount of time I expect to spend studying outside of class is approximately:
- 3 hours or less per week
- 6 hours per week
- 9 hours per week
- 12 hours per week
- 15 hours per week
- 18 or more hours per week

Based on what I currently know, I feel that CVTC's academic standards and expectation are:
- much too high for me
- somewhat too high for me
- slightly too high for me
- just right for me
- slightly too low for me
- somewhat too low for me
- much too low for me

How many dependent children are you responsible for?
- no children
- one child
- two children
- three or more children

How far away from your class site do you live?
- 2-10 miles
- 11-20 miles
- 21-35 miles
- more than 36 miles

The program of courses that I took in high school was designed primarily to prepare me for:
- a manual trade (auto mechanics, farming, plumbing, carpentry, manufacturing, etc.)
- a technical trade (electrical, electronics, data processing, commercial art, medical technician, nursing, etc.)
- secretarial work (typing, filing, dictation, etc.)
- general commerce (sales, purchasing, banking, bookkeeping, etc.)
- a college education leading to various occupations
- other

Based on its general reputation, I would say that my high school's academic standards were:
- far below the average high school
- somewhat below the average high schools
- about equal to the average high school
- somewhat above the average high school
- far above the average high school

In relation to the general population of our society, I consider my academic ability to be:
- considerably below average
- slightly below average
- average
- slightly above average
- considerably above average (in the top 20%)
- extremely high (in the top 5%)

What is the highest level of education completed by your mother?
- 8 years or less of elementary school
- some high school but no diploma
- a high school diploma or equivalent
- 1 to 3 years of college (including study at a technical, community, or junior college)
- a 4-year undergraduate college degree
- a master's degree or higher

What is the highest level of education completed by your father?
- 8 years or less of elementary school
- some high school but no diploma
- a high school diploma or equivalent
- 1 to 3 years of college (including study at a technical, community, or junior college)
- a 4-year undergraduate college degree
- a master's degree or higher

While enrolled in classes, the amount of time I expect to spend working at a job is approximately:
- 0 (I have no plans to work)
- 1 to 10 hours per week
- 11 to 20 hours per week
- 21 to 30 hours per week
- 31 to 40 hours per week
- over 40 hours per week

«Form_ID»

Over ⇒

Please choose one response for each statement by darkening in a circle that indicates your level of agreement or disagreement with the statement. Measuring attitudes is hard to do, so asking the same questions again in different ways is necessary to reduce error. Please be patient and answer each item as naturally as you can without trying to recall previous responses. Bear in mind that there are no "right" or "wrong" answers. Simply provide the answer that best fits you. For questions on study habits and teachers, reference mainly your pre-college experiences.

Statement	Not true at all	Somewhat Untrue	Slightly Untrue	Slightly True	Somewhat True	Completely True
I have found a potential career that strongly attracts me.	■	■	■	■	■	■
Most of my past teachers have been very caring and dedicated.	■	■	■	■	■	■
Books have never gotten me very excited.	■	■	■	■	■	■
I dread the thought of going to school for several more years and there is a part of me that would like to give the whole thing up.	■	■	■	■	■	■
I have financial problems that are very distracting and troublesome.	■	■	■	■	■	■
I pick up new vocabulary words quickly, and I find it easy to use them in my speech and writing.	■	■	■	■	■	■
I take very careful notes during class, and I review them thoroughly before a test.	■	■	■	■	■	■
Most of the past teachers I had in school were too bossy and inflexible.	■	■	■	■	■	■
I plan to transfer to another school sometime before completing a degree at this college or university.	■	■	■	■	■	■
Of all the things I could do at this point in my life, going to college is definitely the most satisfying.	■	■	■	■	■	■
The teachers I had in school respected me as a person and treated me fairly.	■	■	■	■	■	■
My studying is very irregular and unpredictable.	■	■	■	■	■	■
My thinking goes around in circles when I try to choose a primary, long-term occupation.	■	■	■	■	■	■
I have great difficulty concentrating on school work.	■	■	■	■	■	■
I am deeply committed to my educational goals, and I'm fully prepared to make the effort and sacrifices that will be needed to attain them.	■	■	■	■	■	■
My family had a one-sided way of looking at me when I was a child, and they didn't understand my feelings very well.	■	■	■	■	■	■
While I was growing up, I felt that the rest of my family was firmly behind me.	■	■	■	■	■	■
I get a great deal of personal satisfaction from reading.	■	■	■	■	■	■
I have difficulty organizing my ideas in a paper, and I tend to make a lot of punctuation and grammar mistakes.	■	■	■	■	■	■
I am strongly dedicated to finishing college—no matter what obstacles get in my way.	■	■	■	■	■	■
I don't enjoy reading serious books and articles, and I only do it when I have to.	■	■	■	■	■	■
I have made a firm decision to enter a certain occupation and have begun planning my life around that decision.	■	■	■	■	■	■
In my opinion, many teachers are more concerned about themselves than they are about their students.	■	■	■	■	■	■
I am very good at figuring out the deeper meaning of a short story or novel.	■	■	■	■	■	■
I don't have any financial problems that will hinder my schoolwork.	■	■	■	■	■	■
I have a very strong desire to continue my education, and I am quite determined to finish a degree.	■	■	■	■	■	■
I study very hard for all my courses, even those I don't like.	■	■	■	■	■	■
I have the financial resources that I need to finish college.	■	■	■	■	■	■
I have a hard time understanding and solving complex math problems.	■	■	■	■	■	■
My parents and I communicated very well when I was young, and we had a good understanding of each other's point of view.	■	■	■	■	■	■
Most teachers have a superior attitude that I find very annoying.	■	■	■	■	■	■
My understanding of science is very weak.	■	■	■	■	■	■
Learning new vocabulary words is a slow and difficult process for me.	■	■	■	■	■	■
I wish that society did not put so much pressure on people to go to college, as I'd really rather be doing other things at this point in my life.	■	■	■	■	■	■
Over the years, books have widened my horizons and stimulated my imagination.	■	■	■	■	■	■
I am very confused about what occupation to go into.	■	■	■	■	■	■
I have developed a solid system of self-discipline, which helps me keep up with my schoolwork.	■	■	■	■	■	■
I am in a bad financial position, and the pressure to earn extra money will probably hinder my studies.	■	■	■	■	■	■
I am capable of writing a very clear and well organized paper.	■	■	■	■	■	■
When I try to study, I usually get bored and quit after a few minutes.	■	■	■	■	■	■
I can think of many things I would rather do than go to college.	■	■	■	■	■	■
When I was a child, the members of my family often said hurtful things that stirred up unpleasant feelings.	■	■	■	■	■	■
I liked my teachers, and I feel they did a good job.	■	■	■	■	■	■
I have a very good grasp of the scientific ideas I've studied in school.	■	■	■	■	■	■
I often wonder if a college education is really worth all the time, money, and effort that I'm being asked to spend on it.	■	■	■	■	■	■

«Form_ID»

Appendix B
Chippewa Valley Technical College IRB approval

Chippewa Valley Technical College

Eau Claire Campuses

Clairemont
West
Gateway

620 W. Clairemont Ave.
Eau Claire, WI 54701-6162
715-833-6200
Fax 715-833-6470
www.cvtc.edu

INSTITUTIONAL REVIEW OF RESEARCH AT
CHIPPEWA VALLEY TECHNICAL COLLEGE
Research Approval Form

Principal Investigator: Margo Keys

☒ **CVTC Faculty/Staff**
   Research is a requirement for a degree at another institution? ☒ Yes ☐ No
   Degree-granting Institution: University of Minnesota
   Degree-granting IRB approval obtained? ☒ Yes ☐ No ☐ In Process
      If yes, review type: ☒ Exempt ☐ Expedited ☐ Full

   ☐ **External**
   Institution:
   Degree-granting IRB approval obtained? ☐ Yes ☐ No
      If yes, review type: ☐ Exempt ☐ Expedited ☐ Full

Project Title: *College Student Persistence in the Two-year Setting: Identifying risk early to guide early integration*

Begin Date: 10/26/12   **End Date: 10/26/13**

IRB APPROVAL

Review Type: ☒ Exempt ☐ Expedited ☐ Full   **Approval Number: 2012-106**

Laura G. H. King
_____   10/26/12
IRB Coordinator   **Date**

Research may begin after notification of full approval. The IRB coordinator must be notified of any significant changes made to the submitted proposal.

Appendix C
University of Minnesota IRB approval

TO : peter007@umn.edu, keys0003@umn.edu,
The IRB: Human Subjects Committee determined that the referenced study is exempt from review under federal guidelines 45 CFR Part 46.101(b) category #4 EXISTING DATA; RECORDS REVIEW; PATHOLOGICAL SPECIMENS.

Study Number: 1210E22485
Principal Investigator: Margo Keys
Title(s):
College student persistence in the two-year setting: Identifying risk early to guide intervention   This e-mail confirmation is your official University of Minnesota HRPP notification of exemption from full committee review. You will not receive a hard copy or letter. This secure electronic notification between password protected authentications has been deemed by the University of Minnesota to constitute a legal signature.

The study number above is assigned to your research. That number and the title of your study must be used in all communication with the IRB office.

If you requested a waiver of HIPAA Authorization and received this e-mail, the waiver was granted. Please note that under a waiver of the HIPAA Authorization, the HIPAA regulation [164.528] states that the subject has the right to request and receive an accounting of Disclosures of PHI made by the covered entity in the six years prior to the date on which the accounting is requested.

If you are accessing a limited Data Set and received this email, receipt of the Data Use Agreement is acknowledged.

This exemption is valid for five years from the date of this correspondence and will be filed inactive at that time. You will receive a notification prior to inactivation. If this research will extend beyond five years, you must submit a new application to the IRB before the study's expiration date.

Upon receipt of this email, you may begin your research. If you have questions, please call the IRB office.   The IRB wishes you success with this research.