STUDY OF EFFECT OF REMEDIAL COURSES ON RETENTION

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ANALYZING STUDENT RETENTION: A STUDY OF THE
EFFECT OF REMEDIAL COURSES

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A DISSERTATION

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ABSTRACT

The purpose of this research was to determine the rate of retention of college-enrolled students that continued on to their sophomore year after enrollment in a freshman developmental course compared to students that were not enrolled in a developmental course. The population consisted of first time undergraduate freshmen (N=245) at a small Jesuit university in New Jersey.

It was hypothesized that remedial courses would have a statistical effect on second-year retention. Utilizing quantitative data and a t-test, no statistically significant difference was found between students being enrolled in remedial courses and retention to their second year.

It was also hypothesized that there would be a difference in the end of the first year grade point average (GPA) between students who took remedial writing, reading, and math versus students who did not take remedial writing, reading, and math. Utilizing quantitative data, and a chi-square test, there was no statistically significant difference in end of the first year GPA between students who took remedial math courses and those who did not, but there was a statistically significant difference in the end of the first year GPA between students who took remedial writing and reading courses and those who did not take remedial writing and reading courses.

Although there were limitations, this research provided initial support for further quantitative research. If institutions plan to continue offering remedial courses, the institutions should seek to substantiate the effectiveness of the programs. That may lead to restructuring the provision of the courses offered in effective and efficient means that meets the needs of both the college and students.
I dedicate this piece of work to my father, Joseph DeCapua. When you passed, I never thought I would be able to graduate from college, let alone obtain my doctoral degree. The last ten years have been very hard and knowing that you are unable to be here to rub my head and call me a genius still breaks my heart. But, I continued on after you left to make you proud. I love you more and not a day passes by that I do not think about you, and wish you were able to be at my graduation. Every step of this journey has been to make you proud and now that the day has come, I dedicate this all to you.
STUDY OF EFFECT OF REMEDIAL COURSES ON RETENTION

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Chapter 1

Introduction

Educating new undergraduate students who are academically under prepared for college is a critical issue for American colleges and universities. According to Bettinger and Long (2005), there is a great number of students each year that graduate from high school academically under prepared for college. As a result, approximately one-third of entering postsecondary students require remedial or developmental coursework before enrolling in college-level courses (Bettinger & Long, 2005). The focus of this research was to identify factors or variables that may correlate to increasing the likelihood of the retention of academically underprepared college students.

Remedial education, also known as developmental education, has become a widespread and costly intervention aimed at addressing the needs of students who are underprepared, low achieving, or lack preparation as they enter college. Grubb and Associates (1999) defined remediation as “a class or activity intended to meet the needs of students who initially do not have the skills, experience or orientation necessary to perform at a level that the institutions or instructors recognize as ‘regular’ for those students.” Soliday (2002) explained that remedial writing was used to stratify students within institutions as early as the 1940s.

Success in the first few courses of postsecondary education forms the basis for predicting the probability of a student future success in college, specifically at the institution where the introductory courses are taken (Armstrong, 2000). Research suggested that students enrolled in developmental education are at risk of being left
behind in a growing service- and technology-based economy (Bailey & Alfonso, 2005; Boylan, 1999; McCabe, 2000; McCabe & Day, 1998).

This is often complicated by the significant disconnect found between high school success and college readiness (Berkner & Chavez, 1997; Moss & Bordelon, 2007; Schuemann, 1998). The American Association of Colleges and Universities reported that 53% of students entering colleges and universities are academically not prepared, or in other words, lack essential skills in at least one of the three fundamental areas of study reading, writing, or mathematics (Tritelli, 2003). Currently, one of the predictors of attrition for college students is the number of developmental courses a student is required to take prior to advancing to college-level work (Adelman, 1998).

Successfully retaining at-risk students allows schools to maintain current enrollment levels and to do it in a way that is less expensive than admitting more and more academically under prepared students (Braunstein, Lesser, & Pescatrice, 2006; Wetzel, O'Toole, & Peterson, 1999). Improving retention and graduation rates is important in terms of accountability, rankings, and recent national interventions that have focused on collegiate academic outcomes (Radcliffe, Huesman, & Kellogg, 2006).

College and university student retention and attrition have been examined closely in the professional literature during the past twenty years. Much of what has been written from a sociological perspective applied constructs taken from Durkheim’s (1951) theory of suicide, particularly his idea of how varying levels of social integration might influence an individual’s decision to commit suicide. Spady (1970) and Tinto (1975) applied these constructs to student retention in higher education, arguing that a student’s decision to drop out of college is similar to an individual’s decision to commit suicide,
because both decisions represent examples of an individual breaking ties with a social system, and both decisions are likely motivated by low levels of social integration (i.e., low levels of normative congruence and friendship support). By contrast, Tinto (1990) believed that the frequency and quality of contact with faculty, staff, and other students have shown to be independent predictors of student success. Tinto (1997) contended that the first year of college, especially the first semester, is critical to the students being assimilated into the college campus.

If a student’s academic and social values, both of which develop over time as a function of a student’s upbringing, and work well with an institution’s academic and social frameworks, a high degree of academic, and social integration will increase the likelihood of student retention (Tinto, 1993). As noted by Cuseo (1991), nearly 40% of all students leave four-year institutions without receiving their degrees. According to Tinto (1993), more students leave higher education prior to degree completion than stay.

About one-half of all students who drop out of college do so during their freshman year; many leave during the first six to eight weeks (Noel, Levitz, & Saluri, 1985). Studies have shown that a student's sense of belonging is directly related to their retention and integration to the academic environment or decisions made to remain in school (Tinto, 1993).

Retention in higher education can be examined by using college enrollment data to examine student progression in developmental education courses, college level courses, and ultimately certificate or degree attainment. By examining this data, colleges can identify the effect of intermediate attainments or momentum points such as the
completion of a college success course, participation in a learning community, or completion of 30 to 45 college credits (Jenkins, 2008).

A study by Davis; Langley; Lauver; Le; & Robbins, (2004), examined the relationship between psychosocial, study skill factors, and college outcomes by analyzing 109 studies. By using educational retention and motivational theory, they developed nine constructs: achievement motivation, academic goals, institutional commitment, perceived social support, social involvement, academic efficacy, self-concept, academic skills, and contextual influences. The two outcomes targeted were performance (GPA) and retention (retention). They found self-efficacy and institutional commitment as the strongest predictors of retention. Achievement motivation was found to be the strongest predictor for GPA (Davis et al., 2004).

In the ACT Policy Report (Lotkowski, Robbins, & Noeth, 2004), 400 studies were reviewed to identify academic and non-academic factors that had the greatest effect on college retention and performance as measured by grade point average (GPA). The focus was on full-time students enrolled in four-year, U.S. postsecondary institutions. The meta-analysis identified academic-related skills, academic self-confidence, and academic goals as the factors having the strongest relationships to college retention (Davis, Langley, Lauver, Le, & Robbins, 2004). Examining student data also helps colleges to develop a culture of evidence about specific strategies that can help improve student retention or identify barriers that may be causes of student attrition.

The challenges of underprepared students and student success can be examined by using college enrollment data to observe student advancement in developmental education courses. Examining student data also helps colleges to develop a philosophy of
evidence about strategies that can improve student success or identify obstacles that may be causes of student attrition. The purpose of this study was to detect factors that may increase the probability of the retention of academically underprepared.

**Problem Statement**

The purpose of this research was to investigate the level of retention of students that went on to their sophomore year after being enrolled in developmental courses versus students that were not enrolled in developmental courses.

While New Jersey has the nation’s highest high school graduation rate, a distressingly high percentage of those who do graduate are “under prepared” for college or careers (Education Transformation Task Force Initial Report, 2011, p.3). As illustrations of these assertions, data compiled by the National Center for Higher Education Management Systems (NCHEMS, 2008) showed that, in New Jersey, 82% of ninth graders eventually graduate from high school within four years (many take longer than four years to graduate); 58% enroll in college in the succeeding fall term after high school graduation; 41% are still enrolled in their sophomore year of college; but only 22% will earn a four-year degree. In the U.S., only 18% of employer’s reports that most recent high school graduates with no post-high school education are prepared for advancement in their companies (Provitera, 2005). The continuous evaluation of programs has raised the awareness of professionals in the field of developmental education to seek program improvements that translate into future student success (Gerlaugh, et al., 2007).

Taxpayers are clearly affected by the widespread utilization of remedial education. In fact, one of the strongest voices against developmental education comes
from taxpayers who believe that developmental education represents the duplication of effort and cost (Boylan, Saxon, & Link, 2000). A recent study determined that if one-third of the students taking at least one remedial course were to earn a bachelor’s degree, they would generate more than $74 billion in federal taxes and $13 billion in state and local taxes, while costing the taxpayer about one billion dollars to remediate (Spann, 2000).

Student retention is an important issue for universities and colleges as well. Losing students not only has a negative impact on institutions enrollment, but also on an individual student’s career choice. Universities with high attrition rates face the substantial loss of tuition, fees, and potential alumni contributions (DeBerard, Spielmans & Julka, 2004).

A recent study of freshmen that drop out during their first year of college enrollment provided a descriptive understanding of associated student characteristics (Barr, 2007). Of roughly 19,489 first-time freshmen starting in four consecutive fall terms from 1999 to 2002 at a single college campus, 10,278, or almost 53%, did not return the following fall. Forty-three percent of these freshmen dropouts were recent high school graduates, over 60% were between eighteen and twenty-four years old, over 70% had to transfer or obtain an associate degree as their stated goal, and 80% enrolled in middle- to full-time course loads (six to twelve or more units). What some dropouts appeared to have in common was a general lack of readiness for college work and poor academic performance in both basic skills (below transfer level) and college-level courses.
Universities and colleges continuously evaluate programs to ensure that the programs are meeting the goals of student retention and ultimately graduation. By extension, studies of program and institutional effectiveness, as measured by the success of their students, have shown that their effectiveness is highly dependent on the ability to promote high levels of student involvement (Kuh, Schuh, & Whitt, 1991; Kuh, Kinzie, Schuh, Whitt & Associates, 2005).

Retention rates are generally calculated based on data from first-time, full-time freshmen students who graduate within six years of their initial enrollment date (Hagedorn, 2005). Freshmen retention is commonly defined as returning to regular enrollment status in the first semester of the sophomore year and is strongly associated with the likelihood of eventual graduation from the institution (Mallinckrodt and Sedlacek, 1987); however, major gaps exist in the literature on retaining students beyond their freshman year (Nara, Barlow and Crisp, 2005), despite the importance of retention throughout college in calculating true retention rates.

**Purpose of the Study**

The purpose of this research was to determine the rate of retention of college-enrolled students that continued on to their sophomore year after enrollment in freshmen developmental courses versus students that are not enrolled in developmental courses.

The information obtained will assist schools in evaluating the developmental courses that are offered to students who place in remedial courses. Grubb (2001) suggested that it is not known if developmental education really works due to the lack of research. He pointed out that existing evaluation methods of developmental education fail because evaluators/institutions do not know what the program really does. Levin and
Calcagno (2008) echoed this and stated that relevant literature has very little evidence for the effectiveness of developmental education practices and effects on retention.

As the literature suggested, it is important for colleges to know more about their students before they enter and after they leave, than we do when they are actually enrolled at the college (Attinasi, 1991). Statements like this illuminate a need for research that not only looks at program components, but also improves information about many perspectives and outcomes of developmental education programs that serve academically underprepared students (Grubb, 2001).

After the statistics portion of this quantitative study was completed, it was determined there is not a significant difference in retention between freshmen and sophomore year for students who were placed in remedial courses versus students with no remedial courses. The study also discovered that there was no statistically significant difference in end of the first year GPA between students who took remedial math courses and those who did not, but there was a statistically significant difference in the end of the first year GPA between students who took remedial writing and reading courses and those who did not.

**Research Questions**

The issues and focus for this research was the level of retention of students that went on to their sophomore year after being enrolled in developmental courses versus students that were not enrolled in developmental courses.

In order to meet this objective, the researcher must answer the following four research questions:
1. Is there a difference in the rate of retention between freshmen and sophomore year for students placed in remedial courses versus those enrolled only in non-remedial courses?

2. Is there a difference in end of first year college GPA between students who took remedial math and those who did not take remedial math?

3. Is there a difference in end of the first year college GPA between students who took remedial writing and those who did not take remedial writing?

4. Is there a difference in end of the first year college GPA between students who took remedial reading and those who did not take remedial reading?

**Research Hypotheses**

The following hypotheses were tested in this research.

\( H_1 \)  
There is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses.

\( H_2 \)  
There is a difference in end of the first year college GPA between students who took remedial math versus students who did not take remedial math.

\( H_3 \)  
There is a difference in end of the first year college GPA between students who took remedial writing versus students who did not take remedial writing.

\( H_4 \)  
There is a difference in end of the first year college GPA between students who took remedial reading versus students who did not take remedial reading.
Limitations

Most studies encounter some degree of limitations associated with validity; particularly with internal and external validity (Mertens, 2005). This study assumed that student success was measured by remedial courses, without taking into consideration other resources such as tutoring, academic advisors, and freshmen seminars. These assumptions threatened the internal validity of the study.

Delimitations

Other variables influence performance of students in remedial classes or retention, variables such as, family support, motivation factors, ethnicity, disabilities, marital status and income were not explored. There is literature that consistently identifies academic integration, social integration, gender, precollege performance, ethnicity, and financial and socioeconomic status as predictors of retention or, inversely, contributors to attrition (Bean & Metzner, 1985; Pascarella & Terenzini, 1983; Spann, 1990; Stage, 1988; Tinto, 1975).

Students who left during the first year or transferred into the university were not included in the study. Students who were coded as international students or placed in special academic programs were also not included in the study.

Another delimitation of this study is the students who were sampled are from a small Jesuit university in New Jersey. Results of a similar study could vary at a larger city college and/or a state school. This limitation threatens the external validity of the study.
This study did not provide an opportunity for students to express a reason for the outcomes. Therefore, the results were based solely on the data collected.

**Definition of Terms**

For purpose of this study, the following terms are defined.

**ACCUPLACER** – a computerized placement test for students entering two- or four-year colleges. Information from the test provides placement, advisement, and guidance information for the student (College Board, 2002).

**Basic skills** – Basic skills include the ability to pay attention and concentrate. This includes, “appropriate study skills, strategies, and habits” as well as memory, listening, speaking, reading, writing, and mathematical skills (Angelo & Cross, 1993, p. 20).

**Freshman** – A student entering college for the first time.

**Grade Point Average (GPA)** – A numerical result calculated by taking the number of points a student earned in a given period of time divided by the total number of credits taken (Grade Point Average, 2011). Grades such as W, WD, and P are not included in the GPA.

**Remedial Education** – “Also known as postsecondary remediation, developmental education, basic skills education, compensatory education, preparatory education, or academic upgrading is composed primarily of sequences of increasingly advanced courses designed to bring underprepared students to the level of skill competency expected of new entrants to postsecondary education” (Remedial Education, 2012).
Scholastic Aptitude Test (SAT) – The SAT is a standardized test for college admissions in the United States. The test is intended to assess a student's readiness for college.

Self-efficacy – The student’s self-appraisal as to whether or not they can successfully carry out the behavior required to produce a particular outcome (Bandura, 1997).

Student Success – The act of retaining students throughout their freshman year into sophomore year of college.

Student Retention – When a student succeeds to point where he/she remains enrolled in college until degree completion or graduation.

Summary

This study investigated whether there was a difference in students’ retention rates for those freshmen students who completed developmental courses and for those freshmen students who did not complete developmental courses. There is a lack of institutional information on remedial education; therefore, the effectiveness of these programs has been put into question. The objective of this study was to gain an understanding of how remedial courses impact student success. In order to meet this objective the researcher answered four research questions and tested four hypotheses.
Chapter 2

Review of Literature

Relevant scholarly literature concerning developmental education and student success was used in preparation for this research. This investigation revealed the reasons for the epidemic colleges face in regards to low student retention, as well as the impact it had on students, educators, society, and institutions of higher learning. A variety of search engines and printed sources, such as books, journals, and chronicles, were utilized to obtain information for the literature review. For the purposes of this research, several key word search methods were used to search databases including (a) theoretical framework (b) developmental education, and (c) student retention. While these were the main themes used for this research, the literature reviewed was not limited to these words or concepts.

Theoretical Framework

Research on student departure, persistence, and attainment of educational goals in institutions of higher education has been quite extensive (Bean, 1980; Bean & Metzner, 1985; Braxton, 2000; Cabrera, Castaneda, & Nora, 1992; Pascarella & Terenzini, 1977; Spady, 1970; Tinto, 1975), yet educators have only begun to understand and assess the complex causes that lead to departure or students’ lack of persistence toward academic goals. There have been some authors that have studied retention, but the few that will be discussed are the individuals that created conceptual models that serve as the foundation of retention research.
Bandura’s Self-Efficacy Model

One psychological model that explained student retention combined self-efficacy theory, coping theory, and attribution theory (Bean & Eaton, 2000). Self-efficacy defined by Bandura (1977) is a person’s conception of his or her ability to complete certain tasks or behaviors. Brown, Larkin, and Lent (1987a) found that high levels of self-efficacy were important for underprepared students. Peterson’s (1993) study of at-risk students found a link between career decision-making and academic integrations. Self-efficacy enables students to adapt, survive, and gain confidence in situations on campus (Bean & Eaton, 2000).

Bandura’s (1986, 1997) self-efficacy model posited that an individual’s own perception of his or her ability to carry out certain actions to attain an outcome is based on past experiences and observations. When a person distinguishes his or her competence, a sense of self-confidence will be gained, and he or she will have aspirations for persistence.

Weiner’s Attribution Theory

Weiner’s (1986) attribution theory focused on locus of control. Rotter (1966) defined locus of control as an individual’s causal perspective for outcomes and experiences. For example, a student with a sense of internal locus control attributes the outcome to personal and internal factors. Wang; Kick; Frazer; Bums; & Jerome, (1999) found evidence that internal locus of control is associated with high self-motivation, superior academic performance, higher social maturity, and greater independence. Locus of control in attribution theory explains how students became integrated into the academic environment (Bean & Eaton, 2000).
Hladkyj; Perry; Pelletier; & Pekrun (2001) studied what they refer to as a “paradox of failure” (p. 776). This contradiction occurs when a successful and happy high school student fails when left up to his or her own devices in college. Perry (2003) found that lack of locus control is a major attribute to why students fail during the transition from high school to college. If an individual has a sense of external locus of control, they attributed outcomes as factors that are beyond their control.

**Bean’s Attrition Model**

Bean (1980) based his first conceptual model of attrition on a model of turnover in the workplace. The ideas that conceptualized the theory were Price’s study of employee turnover, which explored satisfaction and reasons for leaving. Bean (1980) hypothesized grades would have the same effect in the university setting. He added variables to measure pre matriculation characteristics and student interaction. Bean (1980) found that GPA significantly related to satisfaction, and institutional commitment was the most significant of all variables.

Building on that research, Bean (1985) developed a second conceptual model of attrition in which academic, social-psychological, and environmental factors influence socialization factors, and which in turn influence dropout syndrome. Bean (1985), for his study, defined dropout as the failure of a student enrolled in the spring semester to reenroll at the same campus the following fall semester. Graduate and transfer students were excluded from the study. Bean (1985) believed that attendance is a way to measure success. The dependent variable measured was not dropout, but dropout syndrome.

Because Bean (1985) used dropout syndrome, he did not differentiate between the types of dropouts. Unlike the Tinto (1975) and Spady (1970) studies, he included
those who leave involuntarily due to academic dismissal as socialization failures. There was no distinction between students who are forced to leave due to academic performance and those who dropped out at their own accord. Poor performance was optional; it was the decision of the student not to achieve. It was not due to inadequate preparation or ability.

In other studies, Bean also studied the effect between GPA and psychological factors. In this case, psychological factors can compensate for low academic achievement but high academic success cannot compensate for low satisfaction (Bean & Metzner, 1985). An example that best explains the study is this: if a student enjoys association with the institution, he will persist despite poor grades. However, if the student does not think there will be any positive outcome associated with earning a degree, they may drop out despite a high GPA.

![Figure 1: Bean’s Student Attrition Model](image)
**Tinto’s Social Integration Model**

Tinto’s (1975) model is one of the most widely tested frameworks on student persistence. Tinto’s model of student withdrawal suggested that the greater a student’s academic and social integration into a college environment, the larger the level of persistence. A college student’s integration into an institution’s social and academic system is a process of socio psychological interactions between pre-college characteristics and the nature of college experiences (Tinto, 1975).

In 1993, Tinto built and modified his longitudinal study concerning college retention. He suggested the interactions students have with the institution can lead to positive experiences, those that heighten goals and commitments to the institution, or negative experiences, those that weaken goals and commitment (see figure 2).

As can be seen from Figure 2, one of the areas in which a university can become involved is the student’s adjustment to college. Early college experiences impact a student’s level of confidence and persistence to an environment. The student’s level of coping and fulfillment become related to satisfaction. The lower the satisfaction means greater chance for a student to withdraw. It cannot be left to chance that students will seek out assistance themselves. Programs such as the first-year experience, learning communities, major exploration, skills workshops, and extended orientations are created to address the issue of transitions into college. These types of programs are efforts put forth to assist entering students. Cuseo (2003) claimed that a student’s ability to make a commitment to life goals, program goals, a college major, and so forth is the most important factor in student persistence. He stated that three out of four students entering
the university have no clear career or occupational goals, and only 8% of declared students have an understanding of their majors.

As the students enter a university, personnel have to be willing to invest time and money in resources that will assist with student success and retention. Tinto (1993) cited institutional commitment, by student and by university, as critical in retention. Setting high standards and outcomes for the students serve as instruments to guide students that enter underprepared, as well as serve as a baseline for students who are academically ready for college. Regardless of the population that is being targeted, students perceive the level of expectations and interpret their value to the university (Tinto, 2002).

It is the job of the university to ensure students can meet academic standards. To enhance learning, providing the students with academic advising, tutoring, counseling, and student groups is imperative. Once students understand how to study and how to retain new and important information, they will enjoy the learning experience. Retention, under broad analysis, ultimately depends on student learning (Tinto, 2002).

Tinto’s theoretical model also shows the importance of extracurricular activities. Student engagement and involvement is an integral part of trying to retain students. Some studies have shown the more involved students are in campus activities, the more likely they are to retain to senior year and graduate. Other studies have shown the relationship between the student making a personal connection with just one faculty or staff member on campus and continuation in the university (Astin, 1993; Crocket, 1978; Gardner & Kramer, 1983; Noel, 1985; Rendon, 1995; Tinto, 1987).

According to Tinto (1990), students enter colleges with pre-entry attributes such as prior education, socioeconomic status, family characteristics and personal attributes
that impact their educational goals. There are no two students with the same issues; therefore, the need for research must be continuous and inclusive of many different student characteristics.

The models described above all have a variable in common, student departure and persistence. Even though not all persons or institutions are alike, all schools face the same issue of ensuring persistence of their students to achieve adequately enough to enroll in the next year of school.

Figure 2: Tinto’s 1993 Theoretical Model of College Withdrawal

Cabrera’s Integrated Model

Cabrera’s model integrates the models of Tinto and Bean (Cabrera, Nora, &
Castaneda, 1993). This model found GPA was a poor measure of academic integration, as regarded in Tinto’s (1975) Student Integration Model, and posited the two as separate constructs in agreement with Bean’s (1980) Student Attrition Model. As a result, GPA and intent to persist had direct paths to persistence. The authors stated, “from a practical perspective, (their) study offers the basis for developing an integrative framework that may help institutional researchers understand the role of institutional and non-institutional variables in the college persistence process” (p.160).

This model identifies that pre-college academic achievement and college GPA indirectly affect institutional commitment. It also recognizes that academic advisement and social factors affect college retention.

Figure 3: Cabrera’s Integrated Model
Pre-College Assessment

The literature in this chapter demonstrates that there is a large number of students who enter college under prepared; however, a connection that needs to be discussed would be what is happening to prepare the students to enter college.

The transition from college puts a large amount of personal responsibility and stress on students. Senior year at high school as well as the transition from secondary to postsecondary school is a very stressful experience (Labelle & Lachance, 2003). High school students, parents, and even high school educators, are often confused as to how high school students should prepare for college (Venezia & Kirst, 2005). High school students often have assumptions that can lead them to making wrong college preparation choices (Venezia & Kirst, 2005).

Research has shown that a student’s expectation of his/her acceptance in a college is a major factor on a student’s enrollment in college (Cabrera & La Nasa, 2000; Hearn, 1987). In addition, high school guidance counselors play an important role in supporting high school students’ decision process about which postsecondary institution to attend (Center for Education Policy Analysis, 2002; Falsey & Heyns, 1984; Lee & Ekstrom, 1987; McDonough, 1997; Stanton-Salazar, 2000). The literature displays the pattern that one’s outlook on control has a great impact on how students handle that stress and consequently on academic achievement (Labelle & Lachance, 2003; Perry, 2003).

The Scholastic Aptitude Test (SAT) has been found to account for approximately 24% of the variance in college academic achievement (Kobrin & Milewski, 2002). While this is a significant variance, the statistic does not account for all the reasons students are not prepared for college. Many students do well in college when they score low on the
SAT. But some who score high on the SAT do poorly in college (Kobrin & Milewski, 2002). This variance suggests the possibility that testing is not a reliable measure of a student’s aptitude for success in college. Sternberg (1996) suggested that the inconsistency in predicting success could occur because the variables measured in standardized tests do not build a complete picture of the candidate. The SAT has been shown to have an even weaker relationship with degree attainment than with college freshman GPA (Wilson, 1981).

Within the University where this research was conducted, students were placed into remedial courses based on their score on ACCUPLACER, a suite of tests that determine students’ skill in reading, math, and writing. Students’ SAT scores were looked at as a basis for admitting students into the university, but placement testing is what determined students’ academic level in writing, reading, and math. According to Overstreet (2004), the ACCUPLACER placement test can be used to effectively place students into courses based on their skill levels and capabilities. The ACCUPLACER test can also determine if remedial course placement is needed and can be used to monitor student course progress (College Board, 2003). The test is presented in a computer-adaptive mode that allows for the level of difficulty of additional questions to be subsequently increased depending on how the test taker has answered starter questions (College Board, 2002; Sireci, Patelis, Rizavi, Dillingham & Rodriguez, 2000).

Anthony (2000) sought to identify factors that were most important to students’ academic success and failure during their first year in college. She discovered that variables associated with prior knowledge (such as SAT score) were important factors.
However, Anthony (2000) found that student incentive played a crucial role in achievement or failure.

In a study performed by Maggio, White, Molstad and Kher (2005), certain variables were examined to determine the success and retention of students enrolled in college. The study determined high school GPA and the duration and size of college programs had an effect on students' college GPA. To understand student retention, one must look at indicators that may predict student success.

**Developmental Education**

**History of academically underprepared students in higher education.**

This segment of the collected works provided a brief overview of the historical framework of the response by higher education to academically underprepared students. It will demonstrate that serving the needs of students entering college who are under prepared to successfully complete college-level work has been a challenge for colleges since the inception of collegiate education.

The existence of developmental studies can be traced back to as early as 1849, when the first remedial education programs in reading, writing, and arithmetic were offered at the University of Wisconsin (Breneman & Haarlow, 1998). The existence of developmental studies were also found at Harvard University in 1871. The president of Harvard, Charles Elliot, recognized the necessity for extra assistance to prepare students for college level classes. As a result, Harvard developed an entrance exam and by 1879, 50% of the applicants were conditionally admitted, causing the university to provide extra assistance to prepare students for college-level courses (Casazza, 1999). Canfield
(1889) found that nearly 80% of colleges in 1889 provided some version of a college preparatory program.

According to Casazza (1999), by 1909 there were over 350 institutions of higher learning that offered study skills courses for underprepared students. A survey of state universities done in 1929 found that 25% of respondents tried to identify students with poor reading ability on admission, while slightly less reported providing remediation (Casazza, 1999). By the end of the 19th century, of the 238,000 students enrolled in higher education, more than 40% of first year students participated in remedial programs (Ignash, 1997).

Many universities were concerned about “reputation” or lack of prestige that enrolling underprepared students would have on the university. In a paper presented to the American Council on Education, Astin (1998) postulated that an institution’s “excellence” is defined primarily by resources and reputation. A major boost to an institution’s reputation is the enrollment rates of students with the highest GPAs, the top test scores, and the strongest recommendations. Astin stated:

It goes without saying that the underprepared student is a kind of pariah in American higher education, and some of the reasons are obvious: since most of us believe that the excellence of our departments and of our institutions depends on enrolling the very best-prepared students that we can, to admit underprepared students would pose a real threat to our excellence. (1998, p. 11)

Due to a shortage of students entering universities in the 1960’s, admissions offices began lowering standards to attract academically prepared students to their
institutions. Even with the new strategic approach, application numbers were low, and this forced schools to take another tactic. Community colleges enacted an “open door policy,” which was implemented to attract students and to increase enrollments (Cohen & Brawer, 2003). The innovative open door policy increased enrollments in classrooms, but allowed for academically underprepared students to enroll without any stipulations.

With increased competition for undergraduates, higher education institutions saw increased enrollments of underprepared students. For example, over half of the students enrolled in Harvard, Princeton, Yale, and Columbia did not meet college-entrance requirements and were enrolled in remedial courses (Payne & Lyman, 1998). As was reported, thousands of underprepared students enrolled in colleges and universities from the 1960s to the 1980s in response to open admissions policies and government funding following the passage of the Civil Rights Act of 1964 and the Higher Education Act of 1965 (Payne & Lyman, 1998).

In short, the days when students enrolled into colleges and were fully prepared, or when colleges only offered “college-level courses” merely never existed.

**Remedial education.**

Remedial education has been a phenomenon plaguing universities for a long period of time. It has been an enduring, integral part of higher education, as has the concern about the place of remediation in college-level education (Mansfield & Farris, 1991). That concern has led to a long-standing debate that encompasses issues of equity—providing adequate preparation for a diverse student population—and issues of quality—ensuring high standards at colleges and universities (Mansfield & Farris, 1991).
While institutions were enrolling students that statistically were underprepared, it was not until 1944 that there was a surge in the need for students to be placed in remedial courses. With the passing of the GI Bill, colleges experienced the enrollment of over one million veterans needing support services and further academic preparation in order to be successful (Wyatt, 1992). Colleges with funds were able to develop extensive services due to the GI Bill. In order to work with students in a holistic manner, the creation of advisement centers, tutoring services, and study skill programs were cultivated. These support systems grew and became more comprehensive in order to meet the diverse needs of new students entering college (Casazza, 1999).

In 1995, the National Center for Education Statistics (NCES) conducted a comprehensive survey on remedial courses, which was defined as courses in reading, writing, and mathematics for college students lacking the skills to complete college-level work. Remedial courses can be constituted differently, depending on the institution. Here are NCES’s major findings (U.S. Department of Education, 1996):

- Over three-quarters (78%) of higher education institutions that enrolled first-year students in fall 1995 offered at least one remedial reading, writing, or mathematics course.
- All public two-year institutions and almost all (94%) institutions with high minority enrollments offered remedial courses.
- Twenty-nine percent of first-time, first-year students enrolled in at least one remedial reading, writing, or mathematics course in fall 1995.
- First-year students were more likely to enroll in a remedial mathematics course than in a remedial reading or writing course, irrespective of institution attended.
• At most institutions, students do not take remedial courses for extended periods of time.

• Two-thirds of the institutions indicated that the average time a student takes remedial courses was less than one year, 28% one year, and 5% more than one year.

Remedial education is not always entirely based on a college-level set of standards, but can also be based on admission requirements set by the specific school. In community colleges that offer open admissions, remediation may differ than in schools that grant masters and doctoral degrees. As Astin (1998) pointed out,

Most remedial students turn out to be simply those who have the lowest scores on some sort of normative measurement—standardized tests, school grades, and the like. But where we draw the line is completely arbitrary: lowest quarter, lowest fifth, lowest 5%, or what? Nobody knows.

Second, the ‘norms’ that define a ‘low’ score are highly variable from one setting to another. (p.13)

In conclusion, the above research has shown that there is a need for remedial courses. Given the number of students that enters post-secondary education underprepared for college level work, remedial courses give students who are underprepared the chance to perform satisfactorily, though not necessarily at the same level as students not needing remediation.
Characteristics of Underprepared Students

In order to understand the epidemic of underprepared students, it is important to recognize some potential characteristics. Gaining a better understanding of underprepared students helps support the consideration of retention, and the barriers that students face when placed in developmental courses.

There has been a limited amount of research conducted in regards to the demographic information at a national level of underprepared students. According to one national study, the average age of developmental students is 23 (Boylan, Bonham, & Bliss, 1994). Research further stated that 59% of 23 students reported in developmental education were under the age of 24, 24% were between the ages of 25 and 34 and 17% were over the age of 35 (Knopp, 1996).

According to Boylan, et al. (1994), in 1993 the majority (67%) of students enrolled in developmental education were White. African Americans represented 23% and Hispanic students were 6% of the developmental education population, while Asians represented 3% and Native Americans represented 1% of the population. In this study, racial/ethnic minorities represented about 9% of America’s college students at this time, but accounted for 23% of the developmental population clearly indicating that racial/ethnic minorities are overrepresented in developmental education programs (Boylan, Bonham, & Bliss, 1994). This research also indicated that racial/ethnic minority women represented 51% of all seriously underprepared students. In another report that addressed gender, it stated that females accounted for over half of students needing remediation (Boylan, Bonham, & Bliss, 1994; Knopp, 1996).
Literature has suggested that some developmental students are the first in their family to attend college. One study that focused specifically on developmental mathematics students concluded that the older the student, the smaller the likelihood that his or her parents had completed a college education (Umoh & Eddy, 1994). Inman and Mayes (1999) reported that first-generation students typically came from low-income families and were more likely to be older females, but had the ability to succeed in college within the same capacity of students that are second- and third-generation college students. Research that has been conducted with first-generation college students has had similar results to outcomes of studies done with underprepared students.

Boylan, Bonham and Bliss’s 1993 national study of entering college students in developmental education found that the average high school grade point average of incoming freshmen was 2.4. During the same study, students who completed remedial classes within a three and half year time frame showed a completion or departure from college and a GPA of 2.28 (Boylan, Bonham, & Bliss, 1994). Other research suggested that 50% of remedial students scored below 800 out of a possible 1,600 on the SAT test (Knopp, 1996). Another study suggested that as many as 72% of entering college students scored below college level in one or more subject areas (McCabe, 2003).

Retention

Research on retention is contradictory and inconclusive (Bean, 1985; Cabrera, Nora, & Castaneda, 1993; Jones, 1986; Spady, 1970). Many of the studies that exist have methodological problems and use different definitions for similar terms or the same definitions for dissimilar terms (Astin, Korn, & Green, 1987). Researchers have
concluded that retention is so complex that a single variable cannot predict or explain the phenomenon (Summers, 2003).

**Student characteristics.**

There are many interchangeable terms that discuss the issue of students leaving institutions before degree completion. Attrition is the negative term and retention is the positive (Titley & Titley, 1982). Guttman and Olkin defined the attrition rate as “the proportion of students who leave the program” (1989, p. 2). Others define retention as the school’s ability to keep a student from enrollment to commencement (Berger & Lyon, 2005; Derby & Smith, 2004).

Students are persisters if they obtain a degree but it takes an extended amount of time to do so (Derby & Smith, 2004). Others define persistence as staying in school until graduation (Berger & Lyon, 2005; Brower, 1992).

Dropouts are students who do not achieve their educational goals (Bonham & Luckie, 1993) or they may be students who permanently leave the institution (Derby & Smith, 2004). Students who skip one or more terms but eventually reenroll are stop-outs (Derby & Smith, 2004; Hoyt & Winn, 2004).

For students who complete their degrees in four years, women have higher retention rates, but among those who take longer than four years men have higher retention rates (Astin, Korn, & Green, 1987). Tinto (1975) and Mohammadi (1994) found males to have higher retention than females. Other studies found persistence to be nearly identical for males and females (Barr & Rastor, 1999; Fischbach, 1990; Pascarella & Terenzini, 1979; Wall, Lessie, & Brown, 1996).
Barr and Rastor (1999) found that traditional-age students persist longer than older students. Wall, Lessie, and Brown (1996) found older students were more successful in earning degrees. Mohammadi (1994) did not find age to be significant in predicting retention.

Barr and Rastor (1999) found Asian and Caucasian students to persist significantly longer than African American or Hispanics. Lannai (1997) found black students to have a much lower success rate than white students. Mohammadi (1994) found retention rates for whites to be only slightly higher than for blacks after the first year, but white students had lower retention rates than black students after the second year. Fischbach (1990) found the persistence rate of non-whites to not be much lower than whites, while Wall, Lessie, and Brown (1996) and Fralick (1993) found ethnicity was not related to retention.

Regardless of the demographics shown above, students who are underprepared for college-level work are enrolled in remedial courses. In 1991, The NCES showed that there is no difference in the remedial courses in universities that were predominantly students of color and those that were predominantly white (NCES, 1991).

**Link of remedial education to retention.**

Prior to this point, the research has not linked remedial education to retention. Of the models discussed earlier, all of them have variables that are associated with retention of students, both for underprepared and prepared students. This section will discuss the state of remediation, which research has shown negatively impacts retention.

The influx of students enrolling in colleges have caused educators to be faced with more and more developmental students, thus presenting a challenge to examine the
educational system (Darabi, 2006). Students who are not ready for college are a risk factor (Lassibille & Gomez, 2008). Furthermore, Gabriel (2008) pointed out that underprepared students who are already academically behind their classmates are even more at risk if they are not in class from the start.

Statistics showed that only 51% of high school graduates have college-level reading skills and are ready to meet the demands of college-level reading (American College Testing Program, 2006). It is alarming that nationally only 60% of students take the minimum coursework necessary for college (Venezia, Kirst, & Antonio, 2003). Despite possessing a high school diploma or its equivalent, many students lack the basic literacy skills necessary in college (Perin, 2006).

The reality is that many students are not prepared for college and have a hard time meeting the expectations of a school. One study suggested that as many as 50% of college students are academically under prepared when they began college (Balduf, 2009). Attewell, Lavin, Domina, and Levey (2006) found that 58% of students who enroll in colleges are placed into one or more remedial courses.

Another NCES report was conducted in the fall of 2000, five years after the first comprehensive survey on remedial courses. This study showed that 80% of public four-year institutions offered at least one remedial course in reading, writing, and math. NCES further reports that during that same year, 28% of all entering first-time students enrolled in one or more remedial courses, regardless of which type of institution they attended, suggesting that more than one million students require remediation each year.

NCES reported that of the students in remedial education, 37% took less than one year to complete prescribed remedial courses before moving on to college-level courses,
53% took one year, and 10% took more than one year. At public four-year institutions, the corresponding figures were 62%, 35%, and 3%, respectively (Remedial Education, 2003).

Darabi (2006) believed that students identified at the college-level as basic writers have completed approved education requirements that should prepare them for higher education. Darabi indicated that colleges and universities nationally reported that many students in freshmen classes are not prepared for the work that will be expected of them during their years in college. As cited in Seidman (2005) the U.S. Department of Education Center for Educational Statistics stated that only 50% of students who enroll in higher education would complete a bachelor’s degree.

It is the job of institutions of higher education to have programs and resources in place that will help students remain in school and finish their degree. The National Institute of Education report, *Involvement in Learning*, suggested that students who are involved in activities related to their formal education grow as individuals, are more satisfied with their education, tend to persist in their education to graduation, and tend to continue their learning after college (Study Group on the Conditions of Excellence in American Higher Education, 1984). *Involving Colleges* discussed how colleges and universities should foster student involvement on their campuses (Kuh, Schuh, Whitt, & Associates, 1991) and suggested that one way to do this is to study and encourage student involvement. Tinto (1999) stated that:

Students are more likely to stay in schools that involve them as valued members of the institution. The frequency and quality of contact with faculty, staff, and other students have repeatedly been
shown to be independent predictors of student persistence . . .

Simply put, involvement matters, and at no point does it matter more than during the first year of college when student attachments are so tenuous and the pull of the institution so weak. (pp. 5–6)

**Impact of remedial education on grade point average and retention.**

Prior to this point, the research has not linked the impact of remedial education on GPA and the retention of students. This study has discussed in length the retention of students, but the difference between GPA and retention has only been mentioned. Of the models discussed earlier, all of them have variables that are associated with the affect a student’s GPA could have on retention, both for underprepared and prepared students. This section will discuss the retention of students when GPA is involved.

A study conducted by Camara and Echternacht (2000), discovered the combination of both high school GPA and SAT scores increased the prediction of student success in college. Nobel (2003) believed that the use of both standardized test scores and high school grades in college admissions may aid in students’ persistence and academic success. Astin (1993) conducted a study in which he found students’ high school grades demonstrated to be the most important predictor of college grade point average. Hu (2002) proposed that high school grade point average was the best predictor for second-semester GPA. Snyder, Hackett, Stewart and Smith (2002) found that GPA at the end of the first year is associated with gender, high school GPA, and SAT scores; however, remedial courses were not predictive of academic achievement or retention.
Strategies for Academic Success

First-year students, especially certain minority groups and underprepared students, may be reluctant to ask for help indicating that the responsibility during this stage may necessarily rest with the institution (Tinto, 1987). The following section will discuss the efforts put forth by institutions to maintain the retention of freshmen and help them achieve academic success. Intrusive efforts with first-year students may be the only way to guide students through the challenges, mentoring how to become self-efficient and interdependent within the university culture (Cuseo, 2003; Elkins, Braxton & James, 2000).

First year seminars.

First year seminars or student success courses are courses for entering students designed to help students transition to and engage socially and academically in the college environment ultimately increasing the chances that students will be successful (Barefoot & South Carolina Univ, 1993; Tinto, 1993). Course content generally includes study skills, critical thinking, introduction to campus resources, time management strategies, and academic advising (Barefoot, 2004). Regardless of the topical focus, if freshman seminars are to be effective retention tools, Fidler (1991) suggested the seminars should be small in size (15-20 students) and include high levels of interaction-based learning activities. Research suggested that freshman seminars are being used in some form by over 90% of colleges and universities in the United States (Barefoot, 2002).

In his publication, Where Colleges Fail, Sanford (1969) argued that colleges fail whenever they "treat students as less than a whole person; that learning depends on the
whole personality, not merely intelligence, and that the majority of students lack a sense of institutional community" (p. 3). Researcher, Ernest Boyer (1987, 1990), also found that "new [college] students have little sense of being inducted into a community whose structure, privileges, and responsibilities have been evolving for almost a millennium" (1987, p. 43). He further stated:

Successful freshmen-year program will convince students that they are part of an intellectually vital, caring community...and the spirit of community will be sustained by a climate on the campus where personal relationships are prized, where integrity is the hallmark of discourse, and where people speak and listen carefully to each other. (p. 57)

Learning communities.

Universities are now creating learning communities to assist under prepared students with their course work. Minkler (2002) defined a learning community as a way of deliberately structuring the curriculum so that students are more actively engaged in sustained academic relationships with other students and faculty over a longer period of time than in traditional course settings. Another definition of learning communities is any one of a variety of curricular structures that link together several existing courses or restructure curriculum in a manner that creates opportunities for students to gain deeper understanding and integration of the course material and more interaction with instructors and fellow students as active participants in the learning process (Gabelnick, MacGregor, Matthews, & Smith, 1990).
Students in learning communities tend to form their own self-supporting groups, which extend beyond the classroom. Learning community students spend more time together out of class than do students in traditional, unrelated stand-alone classes and they do so in ways which students see as supportive.

Learning community students become more actively involved in classroom learning, even after class. In this way, learning communities enable students to bridge the divide between academic classes and student social conduct that frequently characterizes student life. Students in these programs tend to learn and make friends at the same time. As students learn more and see themselves as more engaged both academically and socially, they persist at a substantially higher rate than do comparable students in the traditional curriculum.

Research has shown that learning communities improve retention rates within colleges. Lardner and Malnarich (2008) stated “the camaraderie of co-enrollment may help students stay in school longer, but learning communities can offer more: curricular coherence; integrative, high-quality learning; collaborative knowledge-construction; and skills and knowledge relevant to living in a complex, messy, diverse world (para. 6).”

**Faculty interaction.**

A number of authorities have indicated that regular faculty-student contact is the most important factor in student involvement and motivation and can provide students with the needed support to get through the tough times and keep working toward academic success (Chickering & Gamson, 1987; Glennen & Vowell, 1995).

Student interaction with faulty is crucial in order for institutions to retain students. Literature points out that in order to have quality developmental education programs
institutions must hire well trained faculty and staff (Boylan, 1999; Boylan, Bonham, & Bliss, 1997; McCabe, 2003; Roueche & Roueche, 1993). Boylan (1999) suggested that “not everyone can teach developmental courses just because they have an advanced degree” (p. 9). Faculty members that are hired to work with developmental students must be engaged in making a difference in the students’ lives. The perception students have that contact with faculty is limited to academic work is tied to student departure (Pascarella & Terenzini, 1977). According to the article, The Impact of Working on Undergraduate Students' Interactions with Faculty (in press), researchers Umbach, Padgett, and Pascarella (n.d.) stressed that three decades of research on college students indicated that:

Faculty members play a central role in the development of undergraduate students (Astin, 1993; Pascarella & Terenzini, 1991, 2005; Kuh & Hu, 2001; Umbach & Wawrzynski, 2005). These studies further suggest that out-of classroom interactions with faculty, such as the use of asynchronous online discussion groups to get students to engage in cooperative learning are positively associated with gains in academic and cognitive development (Terenzini, Pascarella, & Blimling, 1996), personal and intellectual growth (Astin, 1993; Endo & Harpel, 1982; Pascarella & Terenzini, 2005), and student satisfaction (Kuh & Hu, 2001; Endo & Harpel, 1982). These interactions are frequently the best predictors of student persistence (Braxton, Sullivan, & Johnson, 1997; Pascarella & Terenzini, 1991; Stage & Hossler, 2000).
Likewise, instructional approaches, such as cooperative learning, teacher organization and clarity, and high expectations for students, positively influence cognitive growth (Pascarella & Terenzini, 1991, 2005; Pascarella Edison, Nora, Hagedorn, & Braxton, 1996). (p. 2)

Hard work and perseverance from teachers could be the difference between students remaining in developmental classes or moving forward. Tinto (1993) suggested that while the development of retention strategies is helpful they cannot replace a high quality, caring, and concerned faculty and staff.

**Academic advisement.**

Research has shown that academic advisors play an integral part within the success of retaining underprepared students. The role of college advisors is to help students navigate their schedules and pick the classes that are right for them. Advisors can assist students in understanding their learning styles and the best ways students can retain new information. As quoted in King (2000), Crockett wrote this definition:

> Academic advising is a developmental process that assists students in the clarification of their life/career goals and in the development of educational plans for the realization of these goals. It is a decision-making process by which students realize their maximum educational potential through communication and information exchanges with an advisor; it is ongoing, multifaceted, and the responsibility of both students and advisor. The advisor serves as a facilitator of
communication, a coordinator of learning experiences through course and career planning and academic progress review, and an agent of referral to other campus agencies as necessary. (p. 289)

The theory that academic counseling may be detrimental to students’ chances of attaining their goals has haunted colleges for decades (Bahr, 2008). Student use of counseling and advising is critical given the research that identified academic advising and academic advisors as key links between students, curricula, and colleges (Astin, 1985; Crockett, 1985; Levin & Levin, 1991; Thomas, 1990). Various scholars have convincingly argued that academic advising and exposure to resources such as mentors, high-quality online courses, internships, and applied learning (DiMaria, 2005), as well as personal counseling on psychosocial concerns (Durodoye, Harris, & Bolden, 2000) can contribute to the academic retention of college students. Mentzner’s (1989) approach measured the perception of advising quality on the retention of freshmen at a public university. She found

… good advising had a negative association with dropout based on the following factors: students’ better academic performance (GPA), their belief that an education at the university had greater value for future employment opportunities (utility); more satisfaction with courses and the role of being a student(satisfaction); and less intent to leave the university (p. 432).

A link exists between advising and GPA, as well. Crockett (1978b) found GPA and retention benefit from an effective advising program. Mentzner (1989) found that
advising improves academic performance. Another study found an advising program could improve retention and GPA as well (Hesser, Pond, Lewis, & Abbott, 1996).

Summary

Tinto (1975) reported “with respect to grade performance, many studies have shown it to be the single most important factor in predicting persistence in college” (p. 104). Several other scholars report GPA to be a major and direct predictor of attrition or retention (Cabrera, Nora, & Castaneda, 1993; Fischbach, 1990; Mohammadi, 1994; Pascarella & Chapman, 1983; Wall, Lessie, & Brown, 1996).

Academic success whether, in remedial courses or credit bearing classes is a very important component of retention within higher education institutions. Tinto (2006) pointed out that:

There are also several instruments that purport to measure "dropout proneness" and a number of institutional retention audits that are designed to enable institutions to assess their own actions on behalf of student retention. Many states now use some measure of institutional retention and/or graduation rates in their accountability programs for state sponsored or supported institutions. Several organizations and at least one well-known news magazine now rank institutions and in some cases states, by some measure of retention. Even the Federal government is considering using institutional retention rates in a national system of higher educational accountability. Indeed a number of states already use institutional retention in their accountability
systems. Clearly increasing student retention matters more now than ever. (p. 5)

Research has shown that retention is as important for the institution as it is for the student. Despite the economic importance of a college degree in the United States, approximately 50% of new students entering college will not obtain a degree (ACT Newsroom, 2004). The largest numbers of students who drop out do so at the end of their freshman year (Consortium for Student Retention Data Exchange, 1999) Porter and Swing (2006) further highlighted that institutional attention to persistence rates and the development of institutional initiatives have emerged for a variety of reasons, including:

(1) financial demands, either, to keep tuition-paying students enrolled or to meet the demands of budget-connected, state-mandated performance indicators; (2) reputation enhancement, such as improving rank in U.S. News and World Report, which uses first-year retention rate as a factor in their annual college rankings; (3) perceived advantage in admissions, marketing, and fundraising as retention rate has, for better or worse, become a de facto measure of institutional quality; and (4) mission fulfillment, because graduating students is a marker of success in producing an educated citizenry and a necessary step for reaching a wide array of educational goals. (p. 90)

There are many factors involved when researching the undertaking of retaining students. Educators and institutions have to continue to think outside the box, and ensure that the approach that is being taken is one that assists students.
Whether the students enter college academically prepared to begin their college career, or in need of remedial courses, this research focused on the impact of remedial courses versus non-remedial courses on the retention and GPA of first year students at a small Jesuit university.
Chapter 3

Methodology

Design of Study

This research used a quantitative design. It employed a longitudinal, comparative design that analyzed two groups simultaneously. This quantitative study was intended to investigate the differences in student retention and success rates for students who enrolled in a small catholic university in the fall of 2012. The problem this study investigated was the level of retention of students that went on to their sophomore year after being enrolled in developmental courses versus students that were not enrolled in developmental courses.

This study involved first-time college freshmen enrolled in college during the fall of 2012, and who earned between 24-29 credits during that semester. The participants were broken up into two groups: those who returned for the fall 2013 semester and those who did not.

The independent variable, or discriminating variable, included in the analyses was remedial/non remedial coursework. The independent variable, as well as the retention rates of students, was nominal by nature. Additional demographic variables were collected from student records at the university including (a) gender, (b) ACCUPLACER Placement Test Scores (c) Standardized Aptitude Test Scores (SAT), and (d) Freshmen year Grade Point Average (GPA.) The dependent variables within this study were retention, measured by the success of students continuing on to sophomore year and GPA, measured at the end of the freshman year.
Within this study, a student’s GPA was measured as a comparison of different values. Therefore, GPA was measured on a ratio scale for the purpose of this study. The researcher chose to study the 2012-2013 academic years due to the fact that information was the most current completed data for an entire entering class and was available through the university’s registrars’ office and the schools data system.

**Participants and Sampling Procedure**

This study took place at a small, four-year University in the state of New Jersey. This Catholic University was situated in an urban area in New Jersey. The schools mission is to provide students with a holistic, faith-based education.

The enrollment in the college was between 2,000-5,000 students during the study. In the fall of 2012, a total of 356 freshmen were admitted to the university. For the purpose of this study, students who were placed in special academic programs and transfer students were omitted. Therefore, this study analyzed 245 freshmen. The primary target was first-year students that are placed in a remedial course(s) without the extra assistance that was associated with being a part of a special program.

All incoming students, with the exception of honors students, must take the ACCUPLCER exam to determine the writing and math course they will be taking in their first semester. The remedial courses are Developmental Writing (0 credits), Developmental Reading (0 Credits), and Developmental Math (0 Credits).

Students are not required to take a reading class unless they fail ACCUPLACER. Students are placed into a developmental reading course if their scores are ≤64. They place out of that course if their score is ≥65. So, 65 is the cutoff score (passing grade) for remedial reading. Students are placed into remedial math if their score is ≤16. They
place out of remedial math if their score is $\geq 17$. Students who score between 0-$\leq 4$ on the writing exam will be placed in remedial writing. The English department reads the writing sample submitted by the students to determine if their scoring is accurate. Students who score $\geq 5$ and above will place out of remedial writing. These courses are not computed into a student’s GPA.

A freshman must maintain a 1.8 GPA throughout their first year to be regarded in good academic standing. Students who fall below a 1.8 are put on academic probation. If a freshman student is on probation for two semesters, he or she will be placed on academic suspension at the end of his or her freshmen year. Students that have been suspended are not demonstrating Satisfactory Academic Progress (SAP), which means that they are also ineligible to receive any financial assistance. Suspended students are allowed to continue to take classes at the university, but must pay for courses. Students are academically suspended and ineligible for financial aid when their progress fails to meet either the GPA requirements or course completion rate requirements shown in the charts below.

### GPA requirements.

<table>
<thead>
<tr>
<th>Attempted Credits</th>
<th>24-47</th>
<th>48-71</th>
<th>72-95</th>
<th>96+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum cumulative GPA needed</td>
<td>1.5</td>
<td>1.8</td>
<td>1.9</td>
<td>2.0</td>
</tr>
</tbody>
</table>

### Course completion rate requirements.

<table>
<thead>
<tr>
<th>Attempted Credits</th>
<th>24-47</th>
<th>48-71</th>
<th>72-95</th>
<th>96-119</th>
<th>120-180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Completion Rate</td>
<td>50%</td>
<td>54%</td>
<td>58%</td>
<td>62%</td>
<td>67%</td>
</tr>
</tbody>
</table>

This study investigated whether there was a difference in students’ retention rates for those freshmen students who completed developmental courses than for those freshmen students who did not complete developmental courses.
Instrumentation

Data were collected by the university’s Office of the Registrar and were provided to the researcher in a raw format. The researcher also utilized placement test scores that were recorded in ACCUPLACER. Upon entering the University, students were mandated to test in math, writing and reading. These scores were the determining factor as to whether they enrolled in remedial courses or non-remedial courses. Information was also utilized from the university’s data system, DATATEL. The researcher then coded and entered the data into a Statistical Package for the Social Sciences (SPSS) PC Version 20.1 format.

Data Collection and Recording Procedures

The Institutional Review Board (IRB) within the university in New Jersey granted the permission for this study. The Institutional Review Board within Creighton University also granted permission for this study. The data were collected from the registrar’s office and ACCUPLACER. The students’ names were deleted from the data to ensure confidentiality. The data report was received in a Microsoft Excel Worksheet File. The provided data contained the following variables: gender, high school GPA, last term of attendance, and number of credits earned.

A secondary Microsoft Excel Sheet was downloaded from ACCUPLACER, the testing software used by the students before classes begin to determine their placement in reading and math. Depending on the score, certain students were placed in a reading course. The provided data contained the following variables: math placement, writing placement, and/or reading placement.
Data Analysis and Reporting Procedures

A chi-square statistical test was used to test hypothesis one and an independent $t$-test was used for hypotheses two through four. The chi-square test measured whether there was a difference between two different groups, those who attended remedial courses and those who did not attend remedial courses. A $t$-test assessed whether the means of groups were statistically different.

The hypotheses tested were as follows:

$H_1$ There is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses.

$H_2$ There is a difference in end of the first year college GPA between students who took remedial math versus students who did not take remedial math.

$H_3$ There is a difference in end of the first year college GPA between students who took remedial writing versus students who did not take remedial writing.

$H_4$ There is a difference in end of the first year college GPA between students who took remedial reading versus students who did not take remedial reading.

Summary

A descriptive quantitative design was used to determine whether there was a difference in students’ performance and retention rates for those sophomore students who completed freshman developmental courses versus those sophomore students who did not complete freshman developmental courses. Remedial reading, writing, and math were the
courses that were examined in this study. The participants in the study were first-time freshmen enrolled as full time students for the fall of 2012 within a Catholic university in New Jersey. A total of 245 students were used as participants in this study. These data were provided by the registrar’s office at the university. A chi-square statistical test was used to test hypotheses one, and a t-test was used to test hypotheses two through four.
Chapter 4

Results

Results Overview

The purpose of this analysis was to identify what, if any, difference existed between the retention of students that went on to their sophomore year after being enrolled in developmental courses versus students that were not enrolled in developmental courses.

This chapter provides the results of the data analysis done on the end of the first year grade point averages (GPA) for students enrolled in remedial courses versus students not enrolled. Included in this chapter is a description of the population used in the study and results of the analysis of the data related to each of the research questions. These questions were:

1. Is there a difference in the rate of retention between freshmen and sophomore year for students placed in remedial courses versus non-remedial courses?
2. Is there a difference in end of the first year college GPA between students who took remedial reading and those who did not take remedial reading?
3. Is there a difference in end of the first year college GPA between students who took remedial writing and those who did not take remedial writing?
4. Is there a difference in end of first year college GPA between students who took remedial math and those who did not take remedial math?
Descriptive Statistics

The population of students used for the purposes of this research is a cohort of first-time, full-time college students enrolled in a bachelor’s program, at a small Jesuit university during Fall 2012 semester. Some students in this study placed below college level in mathematics, reading, or English. Student scores on the ACCUPLACER test, which is required by the college prior to enrollment for all first-time students, determined placement.

This population was selected due to efforts made at the university to improve retention of students in developmental education during the first year period. The undergraduates used in this research were based on the academic records of 245 (n=245) students. The frequencies for the variables identified in this research are identified in Table 1. The sample were 49.4% (121) female and 50.6% male (124).

Table 1: Frequency Analysis of Gender

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>121</td>
<td>49.4</td>
</tr>
<tr>
<td>Male</td>
<td>124</td>
<td>50.6</td>
</tr>
</tbody>
</table>

As can be seen from Table 2, of the 245 first-time college freshmen who were enrolled in the 2012-2013 academic year, 199 students (81.2%) were retained to their sophomore year while the remaining 46 (18.8%) did not retain to their sophomore year.

Of the students in the sample, 14 students (5.7%) took remedial reading, 28 students (11.4%) took remedial writing, and 30 students (12.2%) took remedial math. Out of the students in the population, 231 students (94.3%) did not have to take remedial
reading, 217 students (88.6%) did not have to take remedial writing, and 215 students (87.8%) did not have to take remedial math.

**Table 2: Frequency Analysis of Participants Retention**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Response</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention</td>
<td>Yes</td>
<td>199</td>
<td>81.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>46</td>
<td>18.8</td>
</tr>
<tr>
<td>Remedial Reading</td>
<td>Yes</td>
<td>14</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>231</td>
<td>94.3</td>
</tr>
<tr>
<td>Remedial Writing</td>
<td>Yes</td>
<td>28</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>217</td>
<td>88.6</td>
</tr>
<tr>
<td>Remedial Math</td>
<td>Yes</td>
<td>30</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>215</td>
<td>87.8</td>
</tr>
</tbody>
</table>

As can be seen in Table 3, of the 245 students who were enrolled in the 2012-2013 academic year, undergraduates enrolled in a minimum of 3.00 credits, with a maximum of 26.0 credits during the fall semester, while 13.0 was the mean number of credits taken during the fall semester. Undergraduates enrolled in a minimum of 0.00 credits during the spring semester, with a maximum of 18.0 credits during the spring semester; while 13.1 was the mean number of credits taken during the spring semester. The minimum overall credits taken by the students in this sample during the entire 2012-2013 academic year was 3.00, while the maximum amount of overall credits taken were 51.0. The mean amount of overall credits taken by the students in the sample was 27.2.
### Table 3: Analysis of Participants Credits

<table>
<thead>
<tr>
<th>Credit Term</th>
<th>Minimum Number</th>
<th>Maximum Number</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Credit</td>
<td>3.0</td>
<td>26.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Spring Credit</td>
<td>0.0</td>
<td>18.0</td>
<td>13.1</td>
</tr>
<tr>
<td>Cumulative Credit</td>
<td>3.0</td>
<td>51.0</td>
<td>27.2</td>
</tr>
</tbody>
</table>

As noted from Table 4, of the 245 students who were enrolled in the 2012-2013 academic year, undergraduates in this sample achieved a minimum GPA of .333, a maximum GPA of 4.00, with a mean GPA of 2.65. During the spring semester, the students in the sample achieved a minimum GPA of 0.00, a maximum GPA of 4.00, with a mean GPA of 2.67. The minimum overall GPA achieved by the students in the sample during the 2012-2013 academic year was .250. The maximum overall GPA achieved by the students in the sample was 3.91. The mean overall GPA achieved by the students in the sample was 2.69.

### Table 4: Analysis of Participants GPA

<table>
<thead>
<tr>
<th>GPA Term</th>
<th>Minimum GPA</th>
<th>Maximum GPA</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall GPA</td>
<td>.333</td>
<td>4.0</td>
<td>2.65</td>
</tr>
<tr>
<td>Spring GPA</td>
<td>0.0</td>
<td>4.0</td>
<td>2.67</td>
</tr>
<tr>
<td>Cumulative GPA</td>
<td>.25</td>
<td>3.91</td>
<td>2.69</td>
</tr>
</tbody>
</table>

**Analysis**

In this research, remedial courses either impacts retention or do not. Also in this research, students Grade Point Average (GPA) when enrolled in remedial courses versus
no remediation, impacts retention or does not. All of the variables were based on dummy coding, which is dichotomous by nature: either yes or no (coded as 1 or 2).

For each of the research questions, analysis was conducted using SPSS version 21.0 software. To describe the relationship between an outcome (dependent) variable and the predictor (independent) variables, a chi-square test was used to analyze hypotheses one and $t$-test was used to analyze hypotheses two, three and four.

A chi-square test was used to compare the impact of remedial courses on the retention of students. This type of statistical testing is useful when analyzing data from a small sample, as well as when comparing observed frequencies to expected frequencies. According to Levine et al. (2005) the chi-square test for independence is the most appropriate statistical test to analyze proportional differences between populations based on two or more independent samples. The chi-square test determines how much of the outcome is associated with chance.

An independent $t$-test was used to compare the impact of the end of the year GPA on students that were in remedial courses versus students that were not. This type of statistical testing is useful when comparing two small sets of quantitative data. The $t$-test determines a probability that two populations are the same with respect to the variable being tested.
The following hypotheses were tested in this study

The following hypotheses were tested in this research.

\( H_1 \) There is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses.

\( H_2 \) There is a difference in end of the first year college GPA between students who took remedial math versus students who did not take remedial math.

\( H_3 \) There is a difference in end of the first year college GPA between students who took remedial writing versus students who did not take remedial writing.

\( H_4 \) There is a difference in end of the first year college GPA between students who took remedial reading versus students who did not take remedial reading.

**Inferential Analysis: Retention**

Hypotheses one focused on the impact of remedial courses on the retention of students. The first hypotheses stated there is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus non-remedial courses. A chi-square test was used to compare the impact of remedial courses on the retention of students.

As shown in Table 5, the chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial reading courses versus non-remedial reading courses.
As shown in Table 6, the chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = 2.79, p = .095$. For this study using $p < .05$, therefore, there was no difference in the retention rate of students who took remedial reading versus students who did not take remedial reading.

Therefore, the null hypothesis that there is no difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses is supported.

### Table 5: Remedial Reading Retention Status

<table>
<thead>
<tr>
<th>Retention</th>
<th>Reading Retention</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>Yes</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>190</td>
</tr>
<tr>
<td>NO</td>
<td>Yes</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>41</td>
</tr>
<tr>
<td>TOTAL</td>
<td>Yes</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>231</td>
</tr>
</tbody>
</table>

### Table 6: Summary of Chi-Square Test for Remedial Reading Retention

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>2.79</td>
<td>1</td>
<td>.095</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>245</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 7, the chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial writing courses versus non-remedial writing courses.

As shown in Table 8 the chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = .803, p = .370$. For this study in which $p < .05$, therefore,
there was no difference in the retention rate of students who took remedial writing versus students who did not take remedial writing.

Therefore, the null hypothesis that there is no difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses is supported.

**Table 7: Remedial Writing Retention Status**

<table>
<thead>
<tr>
<th>Retention</th>
<th>Writing Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>YES</td>
<td>21</td>
</tr>
<tr>
<td>NO</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>28</td>
</tr>
</tbody>
</table>

**Table 8: Summary of Chi-Square Test for Remedial Writing Retention Status**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>.803</td>
<td>1</td>
<td>.370</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>245</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 9, the chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial math courses versus non-remedial math courses.

As shown in Table 10, the chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = .139, p = .237$. For this study in which $p < .05$, therefore, there was no difference in the retention rate of students who took remedial math versus students who did not take remedial math.
Therefore, the null hypothesis that there is no difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial math courses versus students not enrolled in remedial math courses is supported.

Table 9: Remedial Math Retention Status

<table>
<thead>
<tr>
<th>Math Retention</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YES</td>
<td>22</td>
<td>177</td>
<td>199</td>
</tr>
<tr>
<td>NO</td>
<td>8</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td>TOTAL</td>
<td>30</td>
<td>215</td>
<td>245</td>
</tr>
</tbody>
</table>

Table 10: Summary of Chi-Square Test for Remedial Math Retention Status

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>1.40</td>
<td>1</td>
<td>.237</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>245</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To summarize, results of hypotheses one shows that there is no significant difference in retention when students were enrolled in remedial courses versus students who were not. It appears that the students who took at least one remedial course did as well as their classmates who were not required to take a remedial course after the first year.

Inferential Analysis: Reading

Hypotheses two focused on the impact of remedial courses on the end of the first year GPA on students who were enrolled in remedial reading versus students who were not enrolled in remedial reading. An independent t-test was used to compare the impact
of remedial reading on the end of the first year GPA for students enrolled in remedial reading versus not enrolled in remedial reading.

The $t$-test revealed that there was a significant difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus non-remedial reading courses. There were significant differences between the students who took remedial reading versus the students who did not take remedial reading. The mean GPA and standard deviation for those students who took remedial reading ($M=1.79$, $SD=1.05$) and students who did not take remedial reading ($M=2.73$, $SD=.834$) are shown in Table 11.

As shown in Table 12, the independent $t$-test was significantly different $t(243, N=245)=-4.03, p=.000$. For this study using $p < .05$, therefore, there was a significant difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus non-remedial reading courses.

### Table 11: Reading Remediation Statistics

<table>
<thead>
<tr>
<th>Reading Remediation</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>14</td>
<td>1.79</td>
<td>1.05</td>
<td>.282</td>
</tr>
<tr>
<td>NO</td>
<td>231</td>
<td>2.73</td>
<td>.834</td>
<td>.055</td>
</tr>
</tbody>
</table>

### Table 12: Independent $t$-Test, End of First Year GPA Analysis on Remedial Reading

<table>
<thead>
<tr>
<th>t</th>
<th>df</th>
<th>Sig. (2-Tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal Variance Assumed</td>
<td>-4.03</td>
<td>243</td>
</tr>
</tbody>
</table>
Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus non-remedial reading courses was rejected resulting in a significant difference between the two groups.

**Inferential Analysis: Writing**

Hypotheses three focused on the impact of remedial courses on the end of the first year GPA on students who were enrolled in remedial writing courses versus students who were not enrolled in remedial writing courses. An independent *t*-test was used to compare the impact of remedial writing on the end of the first year GPA for students enrolled in remedial writing courses versus not enrolled in remedial writing courses.

The *t*-test revealed that there was a significant difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus non-remedial writing courses. The mean and standard deviation for those students who took remedial writing (M= 2.28, SD= .903) and students who did not take remedial writing (M= 2.72, SD= .859) are shown in Table 13.

As shown in Table 14, the independent *t*-test was significantly different *t* (243, N = 245)= -2.57, *p*= .011. For this study using *p* < .05, therefore, there was a difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus non-remedial writing courses.

Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus
non-remedial writing courses was rejected resulting in a significant difference between
the two groups.

**Table 13: Writing Remediation Statistics**

<table>
<thead>
<tr>
<th>Writing Remediation</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>28</td>
<td>2.28</td>
<td>.903</td>
<td>.171</td>
</tr>
<tr>
<td>NO</td>
<td>217</td>
<td>2.72</td>
<td>.859</td>
<td>.058</td>
</tr>
</tbody>
</table>

**Table 14: Independent t-Test, End of First Year GPA Analysis on Remedial Writing**

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>Sig. (2-Tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equal Variance Assumed</td>
<td>-2.57</td>
<td>243</td>
<td>.011</td>
</tr>
</tbody>
</table>

**Inferential Analysis: Math**

Hypotheses four focused on the impact of remedial courses on the end of the first
year GPA on students who were enrolled in remedial math versus students who were not
enrolled in remedial math. An independent t-test was used to compare the impact of
remedial math on the end of the first year GPA for students enrolled in remedial math
versus not enrolled in remedial math.

The t-test revealed that there was no significant difference in the end of the first
year GPA between those students who were enrolled in remedial math courses reading
versus non-remedial math courses. The mean and standard deviation for those students
who took remedial math (M= 2.44, SD= .720) and students who did not take remedial
math (M= 2.70, SD= .890) are shown in Table 15.
As shown in Table 16, the independent t-test was not significantly different \( t \) (243, \( N = 245 \)) = -1.53, \( p = .127 \). For this study using \( p < .05 \), therefore, there was no difference in the end of the first year GPA between those students who were enrolled in remedial math courses versus non-remedial math courses.

Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial math courses versus non-remedial math courses is supported.

### Table 15: Math Remediation Statistics

<table>
<thead>
<tr>
<th>Math Remediation</th>
<th>N</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
<td>215</td>
<td>2.70</td>
<td>.890</td>
<td>.061</td>
</tr>
<tr>
<td>YES</td>
<td>30</td>
<td>2.44</td>
<td>.720</td>
<td>.131</td>
</tr>
</tbody>
</table>

### Table 16: Independent t-Test, End of First Year GPA Analysis on Remedial Math

<table>
<thead>
<tr>
<th>Equal Variance Assumed</th>
<th>( t )</th>
<th>( df )</th>
<th>Sig. (2-Tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-1.53</td>
<td>243</td>
<td>.127</td>
</tr>
</tbody>
</table>

### Summary of Findings

The current study used chi-square and independent t-test to examine factors that support the retention of academically underprepared college students. Performing a chi-square test on hypothesis one and independent t-test on hypotheses two, three, and four resulted in some findings.

The major findings of the study were:
• The research identified that there is not a statistically significant difference in the retention rate of students who took remedial reading versus students who did not take remedial reading.

• The research identified that there is not a statistically significant difference in the retention rate of students who took remedial writing versus students who did not take remedial writing.

• The research identified that there is not a statistically significant difference in the retention rate of students who took remedial math versus students who did not take remedial math.

• The research identified that there is a statistically significant difference in the end of the first year GPA between those students who were enrolled in remedial reading versus non-remedial reading courses.

• The research identified that there is a statistically significant difference in the end of the first year GPA between those students who were enrolled in remedial writing versus non-remedial writing courses.

• The research identified that there is not a statistically significant difference in the end of the first year GPA between those students who were enrolled in remedial math versus non-remedial math courses.
Chapter 5

Summary, Conclusions, and Findings

Overview

This section of Chapter 5 presents the summary, conclusions and recommendations of the study. The summary of the research study contains a brief overview of the significant parts of Chapters 1 through 4, highlighting the key aspects. The conclusion is recommendations for practice and future research.

Summary of the Study

The purpose of this study was to determine the rate of retention of college-enrolled students that continued on to their sophomore year after enrollment in freshmen developmental courses versus students that are not enrolled in developmental courses.

Educating new undergraduate students who are academically under prepared for college is a critical issue for American colleges and universities. The focus of this research was to identify factors that may increase the likelihood of the retention of academically underprepared college students. The literature review examined the theoretical framework of retention, as well as developmental education and student retention. This research study explored the impact of the retention of students that persist to sophomore year when they were enrolled in remedial courses versus students that were not enrolled in remedial courses. The study also focused on the difference in students GPA after the first year when placed in remedial courses versus non-remedial courses. This study was designed to help educators and college administrators understand the
impact of remedial courses on retention and GPA as leaders plan educational programs that involve students that fall within the underprepared population.

The following research questions drove the statistical analyses, which were conducted using the chi-square test and the independent $t$ test:

1. Is there a difference in the rate of retention between freshmen and sophomore year for students placed in remedial courses versus those enrolled only in non-remedial courses?
2. Is there a difference in end of first year college GPA between students who took remedial math and those who did not take remedial math?
3. Is there a difference in end of the first year college GPA between students who took remedial writing and those who did not take remedial writing?
4. Is there a difference in end of the first year college GPA between students who took remedial reading and those who did not take remedial reading?

The following hypotheses were tested in this research:

$H_1$ There is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses.

$H_2$ There is a difference in end of the first year college GPA between students who took remedial math versus students who did not take remedial math.

$H_3$ There is a difference in end of the first year college GPA between students who took remedial writing versus students who did not take remedial writing.
There is a difference in end of the first year college GPA between students who took remedial reading versus students who did not take remedial reading.

**Research Question One: Summary of Findings**

Hypotheses one focused on the impact of remedial courses on the retention of students. The first hypotheses stated there is a difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus non-remedial courses. A chi-square test was used to compare the impact of remedial courses on the retention of students.

The chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial reading courses versus non-remedial reading courses.

The chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = 2.79, p = .095$. For this study ($p < .05$), therefore, there was no difference in the retention rate of students who took remedial reading versus students who did not take remedial reading.

The chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial writing courses versus non-remedial writing courses.

The chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = .803, p = .370$. For this study ($p = <.05$), therefore, there was no difference in the retention rate of students who took remedial writing versus students who did not take remedial writing.
The chi-square test revealed that there was no significant difference in the retention rates between those students who were enrolled in remedial math courses versus non-remedial math courses.

The chi-square test for independence was not statistically significant $\chi^2 (1, N=245) = .139$, $p = .237$. For this study ($p = <.05$), therefore, there was no difference in the retention rate of students who took remedial math versus students who did not take remedial math.

**Research Question One: Conclusion**

It has been shown that students, who were enrolled in remedial courses, achieved the same level of success, as demonstrated by retention, as the students who were not enrolled in remedial courses within the university in this study. Students in remedial courses are retained to their sophomore year at the same level as students not enrolled in remedial courses. Similar findings were shown in a study conducted by Schoenecker et al., which revealed that the successfully remediated students performed as well or better than students who had started college academically prepared. Further evidence suggest in the study conducted by Schoenecker et al., that students who are placed in remedial classes retain just as well, or more than students not placed in remedial classes are shown the study which was conducted at Sinclair Community College.

This study demonstrated that students in remedial courses were more likely to continue their college education than students not in remedial classes. This study also showed that students enrolled in developmental writing and math were more likely to complete college level work within three years than students not enrolled in remedial courses (Easterling, Patten, & Krile, 1998).
In a longitudinal analysis of matched treatment and comparison groups, Schnell and Doetkott (2002–2003) found significantly higher retention rates for students who were enrolled in a first year seminar, such as the one that is offered within the university that is studied. The professors who teach the first year seminar act also as students’ academic advisors. As discussed in chapter 2, academic advisors play an integral part in retention of students. Research suggested that meeting with faculty advisors improves retention (Gerdes & Mallinckrodt, 1994; Grites, 1998; McArthur, 2005; McLaren, 2004; Sayles, 2005; Thompson, Orr, Thompson, & Grover, 2007; Titley & Titley, 1982).

It was established that students who took at least one remedial course were retained as long as their classmates who did not take a remedial course after the first year of college. Therefore, it is possible that taking remedial courses alone is not sufficient to warrant them dropping out of school and not retaining to the next year.

Therefore, the null hypothesis that there is no difference in the retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not enrolled in remedial courses is supported.

Research Question Two: Summary of Findings

Hypotheses two focused on the impact of remedial courses on the end of the first year GPA on students who were enrolled in remedial reading versus students who were not enrolled in remedial reading. An independent t-test was used to compare the impact of remedial reading on the end of the first year GPA for students enrolled in remedial reading versus not enrolled in remedial reading.

The t-test revealed that there was a significant difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus
non-remedial reading courses. The mean GPA and standard deviation for those students who took remedial reading (M= 1.78, SD= 1.05) and students who did not take remedial reading (M= 2.72, SD= .834) were shown in chapter 4.

The independent \( t \)-test was significantly different \( t (243, N = 245)= -4.03, p= .000 \). For this study \( p < .05 \), therefore, there was a difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus non-remedial reading courses.

It has been shown that there is a significant difference between the students who took remedial reading versus the students who did not take remedial reading. Those students who needed remedial reading had a significantly lower GPA at the end of the freshman year compared to those students who did not need reading remediation.

**Research Question Two: Conclusion**

When students come in with remedial reading needs, it puts them at a deficit in all academic areas. By the very nature of these classes being remedial, the courses are meant to develop the missing skills the student is lacking. In this circumstance, the most fundamental skill that the students are deficient in is reading. Categorically, if you improve reading you have the basis to improve the students overall academic abilities. Students must obtain skills in reading in order to be successful in any class that is taken in college. Because all aspects of academia require the ability to read, lesser reading skills may lead to a lower GPA for students enrolled in remedial reading versus students not enrolled in remedial reading.

Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial reading courses versus
non-remedial reading courses was rejected. As shown in the literature from chapter 2, Darabi (2006) indicated that colleges and universities nationally reported that many students in freshmen classes are not prepared for the work that will be expected of them during their years in college.

Therefore, if students are placed into remedial courses and not receiving adequate instruction, students will not develop the skills needed to achieve in their courses and will not attain a high grade point average.

**Research Question Three: Summary of Findings**

Hypotheses three focused on the impact of remedial courses on the end of the first year GPA on students who were enrolled in remedial writing versus students who were not enrolled in remedial writing. An independent *t*-test was used to compare the impact of remedial writing on the end of the first year GPA for students enrolled in remedial writing versus not enrolled in remedial writing.

The *t*-test revealed that there was a significant difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus non-remedial writing courses. The mean GPA and standard deviation for those students who took remedial writing (M= 2.28, SD=.903) and students who did not take remedial writing (M= 2.72, SD=.859) were shown in chapter 4.

The independent *t*-test was significantly different *t* (243, N = 245)= -2.57, *p* = .011. For this study (*p* <. 05), therefore, there was a difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus non-remedial writing courses. Students needing a remedial writing course had a significantly
lower GPA at the end of the freshman year than those students who did not need remedial writing.

**Research Question Three: Conclusion**

Tinto (1975) theorized that the more students feel integrated into the institution, both socially and academically, the less likely they are to drop out. Bean (1980) found that GPA significantly related to satisfaction, and institutional commitment was the most significant of all variables. Bean & Metzner (1985) stated that if a student enjoys association with the institution, he will persist despite poor grades. However, if a student does not anticipate any positive outcomes from earning a degree he may dropout despite a high GPA. Informal contact with faculty has also been shown to impact academic achievement (Pascarella, 1980; Pascarella & Terenzini, 1977, 1978; Spady, 1970).

Given what we know as the result of statistical analysis, it can be shown that the faculties within the university being studied already know about the importance of GPA as a predictor of retention. Faculty members at the institution seem to be aware that increased contact improves academic achievement as well as improving retention. The significant difference between the two groups in end of the year GPA’s suggests that the curriculum in the remedial classes needs to be reevaluated. Faculty must have a curriculum that will teach students the skills that are necessary to master reading and writing in remedial courses so they can achieve in college level courses. The new curriculum should also mandate that students have to utilize the resources available to them on campus such as the tutoring center.
Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial writing courses versus non-remedial writing courses is rejected.

**Research Question Four: Summary of Findings**

Hypotheses four focused on the impact of remedial courses on the end of the first year GPA on students who were enrolled in remedial math versus students who were not enrolled in remedial math. An independent *t*-test was used to compare the impact of remedial math on the end of the first year GPA for students enrolled in remedial math versus not enrolled in remedial math.

The *t*-test revealed that there was no significant difference in the end of the first year GPA between those students who were enrolled in remedial math courses versus non-remedial math courses. The mean GPA and standard deviation for those students who took remedial math (M= 2.44, SD= .720) and students who did not take remedial math (M= 2.70, SD= .890) were shown in chapter 4.

As shown in chapter 4, the independent *t*-test was not significantly different *t* (243, N = 245)= -1.52, *p*= .127. For this study (*p* < .05), therefore, there was no difference in the end of the first year GPA between those students who were enrolled in remedial math courses versus non-remedial math courses.

**Research Question Four: Conclusion**

First-year students primarily take less advanced math courses during their freshmen year. The majority of first-year students are placed in their math courses during the first two semesters of their collegiate career. Upper level math and science courses
are not part of the freshmen curriculum, and most freshmen are not advised to take science courses during their first year. Therefore, students that are placed in remedial math courses are able to concentrate on classes they are enrolled in, and work with faculty and the resources on campus to master the skills needed to complete college-level math.

Therefore, the null hypothesis that there is no difference in the end of the first year GPA between those students who were enrolled in remedial math courses versus non-remedial math courses was supported.

**Summary of Findings and Conclusions**

As the results from statistical testing showed, the differences in retention of students from freshmen year to sophomore year for students who were placed in remedial courses versus students not placed in remedial courses were not statistically significant. In other words, students who participated in remedial courses were retained and at the same rate as students who did not participate in remedial courses.

The findings of the second research questions showed that there were statistically significant differences in end of the first year college GPA between students who took remedial reading versus students who did not take remedial reading. This will be more specifically discussed when the findings and conclusions of each research question are discussed in the following sections.

The findings of the third research questions showed that there were statistically significant differences in end of the first year college GPA between students who took remedial writing versus students who did not take remedial writing.
The findings of the fourth research questions showed that there were not statistically significant differences in end of the first year college GPA between students who took remedial math versus students who did not take remedial math.

Remedial education programs are of great necessity, but often are unwelcomed enterprises given the scores of underprepared students entering institutions of higher learning (Tierney & Garcia, 2008). Lorenzetti (2005) found that developmental education targets at least three distinct populations: the true remedial population; the students who attempted but failed remedial courses, such as reading, writing and algebra; the students who did not prepare for college; and the adult students who may have seen many years pass since they opened an algebra book or wrote a composition. The goal of remedial education is to assist learners attain the skills required to continue and to succeed in higher education (U.S. Department of Education, 2007).

Vincent Tinto (1993) noted, "more students leave their college or university prior to degree completion than stay" (p. 1). Because of this, "calls for accountability tied to funding have renewed interest in student retention strategies and research to help guide the development of those strategies at colleges and universities across the nation" (McClanahan, 2004, p 1). Levitz, Noel and Richter (1999) further pointed out:

As budgets tighten, competition for students increases, resources shrink and regents, legislatures, taxpayers, and prospective students and their families take up the cry for institutional accountability, institutions that put students first will succeed, even excel, just as their students will. (p. 31)
As Tinto (1993) discussed in his longitudinal study concerning college retention, early college experiences can impact a student’s level of confidence and persistence to an environment. Therefore, a student’s level of coping and fulfillment become related to satisfaction. The lower the satisfaction means greater chance for a student to withdraw. As can be seen from the findings of this study, the number of students retaining from freshmen year to sophomore is not decreasing based upon being enrolled in remedial courses. The university in this study has shown it has plans and goals in place to retain students regardless of a student’s remedial needs.

Although there was not a decline in retention, there were differences in GPA for those students needing reading and writing remediation. Therefore, it is suggested that the university leaders consider what path to take when it comes to the curriculum of the remedial courses and the content that is being offered. Remedial education experts and practitioners frequently recommend that basic skills be taught in conjunction with content course materials so that the student may immediately transfer those skills to tasks perceived to be “real” (Commander & Smith, 1995; Dimon, 1988; Harding, 1981; Luvaas-Briggs, 1984; Stahl, Simpson & Hayes, 1992; Wilcox, delMas, Stewart, Johnson, & Ghere, 1997; see also Cross, 1976, p. 42). “Many postsecondary skills-development programs function outside the domain of ‘academic’ departments; they teach strategies in isolation from the actual work to which they are meant to be applied and thus may fail to emphasize transfer of these skills to actual coursework” (Gebelt, Parilis, Kramer, & Wilson, 1996). The curriculum that is being developed for the remedial courses needs to teach the student’s basic skills that can be utilized and developed in their content-based classes. Stahl, Simpson and Hayes (1992) recommended that any remedial program
should also broaden students’ conceptual background knowledge. Those authors describe the problem and their recommendation as follows:

Most students required to take a college reading course can read but are not efficient and effective independent learners. Because these students are often a literate and suffer wide gaps in their prior knowledge, they are not generally prepared to read regularly, widely, or critically. Furthermore, many of these students have not been required to undertake higher-level reading/learning tasks while in the secondary school. Hence, the instructor must meet the needs of students who have both deficiencies in content knowledge and misconceptions about the learning process. Moreover, as recent research has demonstrated in a college freshman-level history course, students may even have misconceptions about specific content areas (Stahl et al., 1992, p. 4).

Study Limitations

A limitation in the study is the difficulty of generalizing the findings to other institutions of higher educations. This quantitative study focused on a specific group of students that were academically prepared and underprepared for college. This research study does not claim that the findings were all encompassing and would be applicable to all postsecondary academically prepared and underprepared students. Therefore, this study only provided an indication of the performance of students who possessed characteristics that identified them as academically prepared and underprepared for the institution within this study.
This study found there was no significant difference in retention between students who took remedial courses and those who did not. This study also found that there was no significant difference in end of the first year GPA between students who took remedial math courses and those who did not take remedial math courses. However, there were significantly lower GPAs for those students needing reading and writing remediation than those students not needing remediation in reading and writing. Despite the findings, it still can be concluded that remedial courses are necessary. Remedial education programs are of great necessity, but often are unwelcomed enterprises given the scores of underprepared students entering institutions of higher learning (Tierney & Garcia, 2008). The outcome of this study may have been different if there was a larger sample size and other variables were investigated.

**Recommendations for Future Research**

Although this research did not find any significant difference in factors that may increase the likelihood of the retention of academically underprepared college students, a number of areas were noteworthy and could provide a springboard for future studies. The significant differences in GPA for those students needing either reading or writing remediation should be further researched.

This study only utilized 245 students and used only one year of data. Consequently, there should be a longer study, one that follows the students through the first two years of college. Future studies should include a survey to the students, which would provide more data for analysis. Also, future studies that look at retention should create a focus group of students who are not enrolled in remedial courses versus those in remedial courses. This group would be helpful in analyzing which students were aware of
the appropriate resources that are available to them. These resources include but are not limited to: academic advisors, tutoring centers, student activities and counseling services. Knowing this information can assist college and universities in developing effective early-intervention models for at-risk students in remedial education.

Further research should also be looked at comparing sophomore or junior year GPA’s to better illuminate the influence remedial classes. Additionally, it is recommended that future studies examine the non-academic factors that affect developmental students’ learning such as parental attitudes regarding education and learning, students' study habits and how they affect learning, students' learning styles, and how teaching can be tailored accordingly to promote academic success and retention.

Future research could be done to evaluate if academic advisors play an integral part in retention. This exact study could be recreated, but adding an interview after each student met with an advisor, which could allow for analysis of retention, remedial courses, and student satisfaction. The interview could consist of questions that would be specifically tailored to their advisement sessions. The students could also fill out a satisfaction survey after meeting with their advisors.

Also, learning communities exist for students in special programs within the university being studied. For purpose of this study, these programs were not included, but, conducting a study where retention is analyzed between students who are placed in remedial courses and enrolled in a learning community versus students who are placed in remedial courses and not enrolled in a learning community would provide interesting information on the benefits of learning communities. Specific research that includes developmental studies and learning communities is necessary to help identify successful
course groupings and identifiable pathways for students. Identification of learning communities and curriculum pathways that demonstrate increased persistence would provide possible models for other institutions to consider. As discussed in chapter 2, research has shown that learning communities statistically improve the retention of underprepared students.

**Conclusion**

As stated previously, the purpose of this study was to investigate the level of retention of students that went on to their sophomore year after being enrolled in developmental courses versus students that were not enrolled in developmental courses.

The outcome of this study found that there was no statistical difference on the retention of students to their second year of college when enrolled in remedial courses. There was also no significant difference in the end of the first year GPA for students who were enrolled in remedial math. There was statistical difference on the end of the first year GPA for students who were enrolled in remedial reading and writing. While the literature indicates a link between remedial courses and retention, more research must be conducted. In order to improve the curriculum offered to first year students, future researchers should conduct this study at their colleges, with as many incoming classes as possible.

The results of this study are available to the sponsoring university to contribute to the planning and development of future courses and retention strategies. They are available, as well, to other colleges and universities committed to increasing the retention and success of their students.
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