Florida's College Placement Test reading scores as an essential indicator for successful completion of the highest college preparatory course in reading

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Florida’s College Placement Test Reading Scores as an Essential Indicator for Successful Completion of the Highest College Preparatory Course in Reading

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Education
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Dedication

My dissertation is dedicated to my mother, Anne and my father, the late Arthur Dandar, who instilled the belief that an education is the most important gift one can give a child; to my husband Russ, who provided words of encouragement; and to my very dear children, Matthew and Kirstyn, who lovingly remained patient for this day to come.
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Florida’s College Placement Test Reading Scores as an Essential Indicator
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Laura Dandar Smith

ABSTRACT

The purpose of this study was to examine the predictive validity of several variables to determine if the Florida Computerized Placement Test - Reading (CPT-R) score alone, or other variables, could determine whether or not a student would successfully pass the highest level college preparatory reading course. The study examined fall sessions 1997-2004 (n=276,079) reading scores for all forms of the CPT to determine at what standard deviation below the cutoff score of 83 a student could still successfully complete the highest level college preparatory reading course. According to the College Board, the 83 scaled score, which exempts a student from taking the reading course, equates to approximately a 70% on the paper/pencil version of the test, yet the study revealed that a scaled score of 64 was the average score for fall sessions 1997-2004, which according to previous studies equates to 9/10th reading grade level on the Nelson-Denny Reading Test (Napoli & Raymond, 1998). In addition, the most frequently obtained scaled score was 75 for fall sessions 1997-2004, which equates to an 11th grade reading level on the Nelson-Denny Reading Test; however, the results of this study
showed only 61% (49,281 out of 79,167) of the upper quartile of students (scaled scores >74) passed the highest level college preparatory reading course.

Although a statistically significant relationship was found between the entry test and successful completion of the highest level college preparatory reading course, the relationship was small, and therefore does not provide very good predictive validity. Interestingly, the study revealed that students who were exempt from the reading course, and still enrolled in the course, did not have higher passing rates in the course. In addition, students with higher placement scores did not have significantly higher passing rates in the reading course than students with lower placement scores. In fact, students with the lowest scaled scores of 11-20 had the highest percentage of successfully completing the highest level college preparatory reading course.

The placement test scores in reading indicate a large number of students entering Florida’s community colleges are not prepared for college-level courses. In addition, the results of this study indicated that the placement test did very little to discriminate between levels of students’ actual reading abilities and predict which students will ultimately pass required remedial/developmental reading classes. Implications from the results of this study affect both high schools and colleges. Although many first-time-in-college students are not recent high school graduates, high schools should be required to include reading as part of the core curriculum, separate and distinct from the language arts courses. Florida high schools need to implement intensive programs of study in reading because students are gravely underprepared for college studies. Teachers, credentialed in reading, should be teaching reading courses in all four years of high school. Diagnostic
testing and year-end testing should occur each year to chart a student’s progress for all four years of high school. In addition, Florida’s college entrance reading placement test should be revised so that it provides a comprehensive measurement of college-level reading skills.
Chapter 1

Introduction

Since most community colleges in the United States view remediation as part of their mission, it is not surprising that in the fall of 2000, 98% of community colleges offered at least one remedial reading, writing, or mathematics course. Cliff Adelman, Senior Research Analyst at the U.S. Department of Education, reported approximately 63% of the students entering community colleges required at least one remedial course (2004). At some community colleges, this figure approaches 70% (McCabe, 1998). Because community colleges serve the community and can respond quickly to market needs, they have been more successful in attracting nontraditional learners (Miglletti, 1998). Many students arrive at community colleges lacking basic skills in math, reading and English. Community colleges respond by offering students who are not eligible to enter four-year institutions an opportunity to remediate their skills and obtain a college education that would otherwise be out of their reach because of poor basic skills (Adelman, 1996). A substantial number who enter college underprepared are still able to be successful because of developmental education.

In Florida, where the proposed study occurred, the Florida Student Database (FSDB) provided information on gender, ethnicity, age and disability. In the school year, 1998-99, the Florida Office of Educational Services and Research reported the typical
community college student was a thirty-one-year-old, white female attending part-time, seeking an AA degree and not receiving aid nor having a disability. Whites comprised 65.4%, while Blacks comprised 15.8%, Hispanics 2.6%, American Indians 0.5% and 0.6% did not report ethnicity or race. Although the average age was thirty-one, 46.5% were twenty-five or younger. Only 2.1% reported a disability; and those reporting a learning disability were the largest portion of this category.

In 2003, the typical Florida college preparatory student was a female between the ages of 26-35. Slightly half of college preparatory students were 21 years of age or over, about one-third full-time, and two-thirds indicated an Associate of Arts degree as their educational goal. Finally, almost 4% of college preparatory students were disabled (Windham, 2003, p. 2).

In Florida, the Division of Community Colleges, examining the 1996 Accountability Report, which focused on successful completion of the highest level of college preparatory courses in reading, writing, and mathematics, found a difference among age groups failing the placement test for the first time. When the 24 and younger group are split into even finer age ranges, being out of high school for even one year has a negative impact on the ability to pass the placement test, but even though the older groups failed at least one section of an entry-level placement test more often than those 24 and under, they completed the highest level college preparatory courses at a higher rate than the younger students for both reading and mathematics.

Tinto (1987) recommended institutions need to develop warning systems to identify and track students who may have difficulty completing programs of study. Since
the Fall of 1997, Florida community colleges are using the College Board’s Computerized Placement Test with cut-offs scores to identify remediation for reading, writing, and mathematics. A scaled score of 83 or higher on the reading portion exempts a student from having to take remedial reading and means the student is ready for college-level courses. Many students repeat the remedial courses several times; consequently, Florida enacted a repeat policy, which allows the student to take the remedial course twice at state tuition rates; however, upon the third attempt, the student must pay out-of-state tuition and the instructor must award a grade. This has not dissuaded developmental students, for many students are persistent, from re-entering college several times in hopes that the second or third try will meet with success.

Statement of the Problem

The rising costs of attending four-year colleges, the increase in college-bound high school students, and a larger number of nontraditional students have resulted in an increasing number of students enrolling in two-year schools nationwide. Florida community colleges compound the problem of escalating enrollments by not identifying students who are unlikely to ever pass the developmental reading classes. Consequently, the problem is two-fold: no classroom space for traditional classes and continuous enrollment of students who have serious skills deficiencies and are unlikely to ever graduate. This problem could be alleviated if the placement test was used as a screening tool, not merely for placement into developmental classes. Florida community colleges need to provide counseling that includes informing a student when his skill levels are too deficient to remediate at a community college. Determining a cut-off score in reading
which identifies which students will not be successful in passing, and therefore would not complete a college program of study, would save many students valuable time and money and let them seek other alternatives for career pursuits. Therefore, research needs to be conducted to identify at what point below the Computerized Placement Test-Reading (CPT-R) cut-off score of 83, a student in Florida will still successfully pass.

In the 1990s, the National Study of Developmental Education found 77% of developmental students at two-year colleges and 98% attending four-year institutions intended to obtain a college degree (Boylan & Bonham, 1992, p.2). Of the 1992, 12th graders enrolled in postsecondary education and completing coursework within eight years of high school graduation, 69% not needing remedial coursework earned a specific degree or certificate compared to 30% who needed any remedial reading (Wirt et al., 2004, p. 63). Clifford Adelman claims degree completion is the true bottom line for college administrators, state legislators, parents, and most importantly, students—not retention to the second year, not persistence without a degree, but completion (1999).

The NCES Fall 2000 study reported the proportion of students requiring remedial reading who did not earn postsecondary credentials rose from 57% in 1982 to 70% in 1992 (Adelman, 2004, p. 94). In 1999, one out of eight students took remedial reading courses, and 65% of this group needed to take at least three other remedial courses, including math (Adelman cited in McCusker, 1999, p. 1). According to Clifford Adelman, “Deficiencies in reading skills are indicators of comprehensive literacy problems, and they significantly lower the odds of a student’s completing a degree” (1996, p. A56).
The Florida Community College System’s “open door” policy is a “revolving door” policy for many students who leave with nothing more than time and money expended. As more and more nontraditional students apply to community colleges, counselors need to advise students who need remediation, especially in reading, that a two-year degree may not be a realistic option. Community colleges have been criticized for providing a “cooling out” function, which is nothing more than retaining a student until he finally realizes he will never graduate from the community college. As Adelman (1996, p. A57) has stated, “…the findings strongly suggest that we cannot continue to let high-school graduates believe that they have a good chance of earning a college degree if they leave high school with poor reading skills.” Thus, student failure does not come from barriers imposed by the colleges, but from a failure of colleges (especially community colleges) to convey clear information about the preparation that high school students need in order to have a chance of finishing a degree (Rosenbaum, 1999).

Significance of the Problem

Remediation has always been with us, and there is no evidence in the four surveys of remediation conducted in 1983, 1989, 1995 and 2004 by the National Center for Education Statistics of any significant increase or decrease in the number of remedial students. According to the Brookings Institute, developmental students do not represent a cost-burden; in fact, total public expenditure is less than 1% of the public higher education budget (Breneman & Haarlow, 1998, p. 5). Yet, many states want accountability for the continuance of remedial programs in community colleges. More states are requiring outcome evidence and statewide policies governing remedial services.
For example, Florida, Colorado, and South Carolina prohibit remedial education at four-year institutions. Virginia, Minnesota, Maryland, Georgia, Nevada, Missouri, New York, and Ohio are also considering similar legislation, and some states are debating whether to require students to pay back the cost of remediation (Kentucky Council on Postsecondary Education cited in An Analysis of Developmental Education at Michigan’s Associate Degree-Granting Institutions, 1999). Many states allow remedial work to count towards institutional credit, for financial aid and funding reasons, but the majority of states do not permit remedial course work to count towards degree or graduation credit (Breneman & Harlow, 1998).

The 1998 Reauthorization of the Higher Education Act prompted debate over whether or not developmental and remedial programs are appropriate at the postsecondary level. Of the nation’s more than 12 million undergraduates, about two and one-half million participate in developmental education during any given year (Boylan, 1999, p. 1). The need for remedial reading appears to be the most serious barrier to degree completion; in fact, 51.1% of the students needing remedial reading are required to enroll in four or more courses (Wirt et al., 2004, p. 141). The Condition of Education 2004 found 10.6% of all entering college freshmen needed a remedial reading course, and of that group only 7% attained an associate’s degree and 17% attained a bachelor’s degree (Wirt et al., 2004, p. 63).

The number of students being served commands educators to examine this population further. In August, 2000, the Board of Directors of the American Association of Community Colleges recommended one way to improve remedial education was to
“evaluate remedial education courses and programs regularly to assess student performance, review average time needed for course completion, evaluate student performance in follow-up courses, and compare graduation rates of students requiring remediation in one or more skills with those who did not” (p.2).

In a personal communication, Associate Vice Chancellor for Evaluation Dr. Patricia Windham of the Florida Division of Community Colleges and Workforce Education suggested a study to examine at what point below the entry-level placement test cut-off score do students not pass the highest level preparatory course in reading (January, 2004). This information could be used to identify which students should not enroll in community college coursework. Furthermore, Adelman (1999) purports that high schools are not providing a rigorous curriculum, so by identifying which students are not capable of pursuing a college degree, many high schools would be challenged to revise high school curriculums which provide the skills students need to successfully matriculate into a college program of study. Adelman further states that students should be advised to either seek another educational provider or receive intense remediation in a specific time period (1999).

Purpose of the Study

Reading has been found to be the primary indicator of successfully completing a college program of study; therefore, the purpose of this study was to examine the predictive validity of several variables to determine if the Florida Computerized Placement Test - Reading (CPT-R) score alone, or other variables, could determine whether or not a student would successfully pass the highest level college preparatory
reading course. The study examined the reading scores on the CPT to determine at what standard deviation below the cutoff score of 83 a student could still successfully complete the highest level of the college preparatory reading course. Florida community colleges’ counseling departments could better serve students by knowing how many standard deviations below the scaled score of 83 on the Florida Computerized Placement Test in reading indicates whether a student is likely to pass the highest level reading college preparatory course. Colleges could then use this information to help make decisions about which students to admit to college programs of study.

Research Questions

This study focused on what variables determine whether a student can successfully pass the highest level college preparatory reading course, which indicates the student is ready for college-level courses. Therefore, this study attempted to answer the following questions:

1. Is there a relationship between a student’s score on the Computerized Placement Test in reading (CPT-R) and success in passing the highest level college preparatory reading course in Florida?

2. Is there a relationship between full-time or part-time enrollment during the semester a student is taking the highest level college preparatory reading course and success in passing the highest level college preparatory reading course in Florida?

3. What are students' GPAs the session following successful completion of the highest level college preparatory reading course according to the program track (Associate of Arts, Associate of Science, Associate of Applied Science)?
The independent variable of the study was the placement test score, which was a nominal independent variable. The other independent variables were full-time enrollment and part-time enrollment. The dependent variable was course success in the highest level college-preparatory reading course, defined as pass or fail, with passing represented as marks of A, B, C, S, or P. In addition, the student’s GPA following successful completion of the highest level college preparatory reading course was the dependent, continuous variable and passing or failing the reading course was the independent variable.

*Definition of Terms*

Several definitions were central to the research proposal. First, *developmental instruction* as defined by Cohen & Brawer (1996) is instruction that provides activities to keep students in school, and helps them improve their basic skills, so they can complete an academic or vocational program satisfactorily. *Developmental* refers to programs that focus on the whole learner, blending academic with the personal strengths and weaknesses students bring to the learning process (Ignash, 1997, p. 3). Others have extended the definition to include activities such as learning skill centers, tutoring, advising, and counseling (Miller, 1996).

The term *remedial* refers to programs that focus on providing remedies for specific deficiencies in reading, writing and math.

Recently, many refer to *college preparatory courses* as those courses providing remedial/developmental coursework via pre-college courses (i.e. basic skills) based on placement test scores. Thus, a *remedial/developmental student* is one whose score on the
college placement test requires one or more combinations of classes in preparatory reading, math and writing. Other names include compensatory education and basic skills (NCES 2003, p. 1).

*Course satisfaction* is the final course mark that is considered passing. For purposes of this study, pass/fail will be used as the variable to represent grades of A, B, C, Satisfactory (S) or Passing (P).

*Completers* are students who have passed the highest level college preparatory course in reading, and *non-completers* are students who have not achieved course success in the highest level college preparatory course in reading.

*Indicators of success* was defined in this study from the literature on developmental education as student persistence, developmental course passing rates, passing grades in college-level courses, grade point averages and/or the ratio of credits attempted to credits earned. This study focused on CPT scores and course success in the highest level college preparatory course in reading.

*GPA* is the acronym for grade point average, which is calculated by computing the grades earned in each course with the number of credit hours taken. Only the last attempt of a repeated course is used in computing the grade-point average. A grade of “W” means a withdrawal from a course and is not computed in the GPA. A grade of “W” does not override a grade of “F.” The instructor determines an incomplete, and an incomplete (I) received at the end of any term becomes an “F” if not completed the succeeding fall or spring term. The student may not register for another section of the course during the period of the incomplete grade. A grade of “N” is used only in college
preparatory courses and may be assigned to students earning a “D” or “F” in a college preparatory course. The grade of “N” is non-punitive, indicating progress has been made but not at the level required for successful completion of the course. College-preparatory courses are not computed in a student’s GPA.

A student who is enrolled in twelve semester hours in the fall or spring sessions is a full-time student. A student who is enrolled in less than twelve semester hours is a part-time student.

Presage variables is another term for predictor variables such as age, gender, and race/ethnicity.

Computerized Placement Test (CPT) is the Florida placement test implemented in July, 1995. The placement test identifies students who need remediation in reading, writing or mathematics prior to entry into college-level classes. The CPT identifies a scaled score of 83 on the reading subtest as exemption from having to take a college preparatory reading course. For purposes of this study, only the reading subtest scores were examined.

College Level Academics Skills Test (CLAST) is used in Florida to determine whether a student will be allowed to graduate from an accredited community college and/or enroll in upper division courses. The test is usually taken after a student has completed 30 credit hours. The earliest point a student can take the exam is after 18 hours of college credit. The CLAST is classified as a criterion-based test and also a minimum competency test. Scores are recorded as pass/fail.
Florida Basic Skills Exit Test is used as the criterion-referenced exit exam for the highest level college preparatory course in reading. The test has different forms with the content developed by Florida reading professors.

Successful completion of the highest level college preparatory reading course means the student may enroll in college-level courses.

Workforce Development in the Florida Community College System (FCCS) provides training programs for employment in industries requiring technical skills. In addition, FCCS provides continuing education and retraining for displaced workers.

The Florida Education and Training Placement Information Program (FETPIP) is a data collection system that provides follow-up data on former students, such as employment, military, public assistance participation, incarceration, and continuing postsecondary education.

A major indicator of success for community colleges is the awarding of degrees. Community colleges award various degrees, which include the associate of arts degree (A.A.), the associate of science degree (A.S.), the associate in applied science (A.A.S.), college credit certificate, the applied technology diploma, and the post-secondary adult vocational certificate, which is non-college credit for occupational training.

Limitations/Delimitations

This study was delimited to developmental programs in the Florida Community College System. Collection of data included the years 1997 to 2005, because these were the years that the Florida College Entry-Level Placement Test (CPT) was implemented as a placement instrument for Florida community colleges with the uniform standard cut-off
score of 83. (Students who have scores on the College Board’s SAT-1 or the American College Testing Program’s Enhanced ACT test that meet or exceed the scores in Rule 6A-10.0315, Florida Administrative Code may be exempted from the Florida College Entry-Level Placement Test.)

The data from each of the twenty-eight community colleges is submitted electronically and the state compiles the data and forwards it back to each community college for review. Checks and balances are in place, for review of the data is continuously evaluated for errors each subsequent semester by the Institutional Research departments of the community colleges and well as the state’s management information data processing. Associate Vice Chancellor for Evaluation Dr. Patricia Windham of the Florida Division of Community Colleges and Workforce Education in a personal communication stated the data was accurate due to the checks and balances in place by both her department and the individual community colleges’ research departments (September, 2005).

Florida’s Council of Instructional Affairs, which includes academic administrators from all 28 Florida community colleges, determined as of fall semester, 1999, all Florida community colleges were required to administer the Florida Basic Skills Exit Test, the instrument used as the exit exam for the highest level college preparatory course in reading. In accordance with State Rule 6A-10.315 Paragraph 19B (Florida Administrative Code Annotated, 1997), the 1997 Florida legislature made passing an exit test a condition for meeting basic skills requirements. According to the law, students must pass both the college preparatory reading course and the criterion-referenced test. The
state of Florida does not record student scores on the Florida Basic Skills Exit Test; therefore, no predictions were made comparing student scores on the Florida Basic Skills Exit Test with student scores on the College Placement Test. The comparison was made with the CPT score and successful completion of the highest level college preparatory reading course (pass/fail). It was assumed the CPT provided an accurate assessment of the student’s ability level and appropriately placed students into the college preparatory reading course.

Summary

Today, a college education is required for many career choices. In reality, many careers are not dependent upon someone having a traditional two-or four-year degree. Students who come to the community college looking for success in their lives depend on educators to counsel them effectively, ensuring that decisions in career-planning are sound. Placement tests identify students, who need remediation, and community colleges provide remediation; however, this is not enough. Identifying students who cannot effectively complete traditional programs of study means that they need to be told they may be wasting their money, and more importantly, their time. Community colleges must go beyond merely placing students into remedial classes and begin to provide counseling to students beyond remediation of basic skills. The Southern Regional Education Board (SREB) (2004) stated only 45% of first-time college freshman attending full-time graduated from 1998-2001, and 32% of students failed to return for the second year at community colleges or other higher education institutions (Summers, 2003, p. 64). As of 2004, the SREB reported that with 30% of students graduating, Florida’s
Community college students were 13 points above the SREB average of 17%.

Community colleges can possibly raise graduation rates by identifying those developmental students requiring remedial reading coursework who are at a very high risk of not benefiting from college level programs.
Chapter 2

Review of the Literature

The purpose of remedial/developmental education is "to enable students to gain skills necessary to complete college-level courses and academic programs successfully" (Weissman, Silk & Bulakowski, 1997, p.188); therefore, research to evaluate whether or not remedial/developmental programs are effective focuses on the indicators leading to successful completion of a college program of study which includes student persistence, grade point averages, developmental course passing rates, passing grades in college-level courses, and the ratio of credits attempted to credits earned. Many individual colleges and statewide college systems have conducted studies on the various success indicators in developmental education.

Historical Perspective of Developmental Studies

For almost 200 years, institutions of higher learning have been accepting students who may not have met their standards while trying to develop ways to meet the needs of diverse learners. One of the most distinctive features of the American educational system is that it gives “thousands of worthy students who would otherwise be excluded a chance to attend higher education” (Brint & Karabel, 1989, p. 10). In the early 1800’s, education at all levels was provided to Americans; moreover, access to higher education was expanded. Since few opportunities existed for early Americans to obtain prerequisite
skills for college, colleges and universities provided preparatory programs. Because learning an academic language such as Latin was not a priority for colonists attempting to survive in a new world, Harvard College (1638) was confronted with remediation by providing tutoring in Latin to incoming students. The use of scholarly books written in Latin, and Latin as the language of instruction, continued into the 18th century in America (Brubacher & Rudy cited in Boylan, 1987).

In the first thirty years of the 19th century, not enough students were prepared for college because the development of colleges preceded the development of a widespread secondary school system. Many students who could afford tutoring were instructed by local ministers. However, soon the number of students requiring tutoring was too large. As a result, in the latter part of the 19th century, many colleges began to offer compensatory education programs that would enable these students to succeed, thus “compensating” them for their lack of skills with adequate remedial (very low under-prepared) or developmental (average skill, but not at level for college success) programs (Cohen & Brawer, 1996). In 1849, the University of Wisconsin implemented the first college preparatory department providing remediation in reading, writing and arithmetic (Brier cited in Boylan & White, 1987, p.2). The department became the model for many colleges and universities.

During the late 19th century, women began attending college. Many argued that women were mentally unsuited for education, but, of course, they simply were under-prepared. Thus, many of the new women’s colleges provided developmental education.
In the same manner, as more and more black Americans entered colleges, the institutions provided developmental education for them (Boylan & White, 1987).

The Morrill Act of 1862, also known as the Land Grant Act, stimulated growth in higher education by requiring institutions to promote higher education for a greater variety of Americans. In 1874, Harvard developed a course to remediate deficiencies of freshman, and in 1894, Wellesley College developed one of the first remedial courses (Cross, 1971). Harvard also implemented the first composition course, which served as a bridge for entering freshman at the level of competency for the Harvard curriculum (Maxwell cited in Boylan 1988).

The Second Morrill Act of 1890 extended land grant colleges to the southern states, providing separate but equal schools for black Americans. Colleges were established in almost every state to provide training for merchants and tradesmen as well as engineers and scientists. Since education was not mandatory, few people had prior preparation for college; therefore, the major criterion for entry was the ability to pay admission fees. Substantial numbers of students required tutoring, which resulted in tutoring classes outnumbering regular college classes, in some instances (Brier, 1984, p.2). By the turn of the century, more than 80% of U.S. colleges and universities offered college preparatory programs (Maxwell cited in Boylan, 1988).

The great disparity in admission policies and, in some cases, the lack of any admission policy, led to the establishment of the College Entrance Examination Board in 1890. The National Education Association (NEA) Committee on Secondary School Studies, called the “Committee of Ten,” devised a secondary school curriculum for
college matriculation. The College Entrance Examination Board’s major objectives were to standardize admission procedures, raise academic standards, and eliminate college preparatory programs. With the advent of admission testing and the inception of junior colleges at the turn of the century, colleges and universities began to phase out college preparatory programs. However, because of the various types of colleges, it was impossible to have a uniform admission standard. Consequently, there was never a standard of admission for all colleges in the United States.

By the 1940s, junior colleges and special divisions within universities provided college preparatory programs. The community colleges’ ways of dealing with the under-prepared took many forms, but primarily, all provided some type of alternate instruction either as a separate course program or an integral program of study. The Veterans Adjustment Act of 1944, providing educational monies for returning World War II veterans, created a new resurgence in providing preparatory programs in colleges and universities. However, it wasn’t until the 1960s that remedial education finally became a larger component of higher education as increasing numbers of students enrolled in higher education. During the twentieth century, junior colleges became the predominant provider of remedial education, although most four-year schools kept vestigial programs. The Higher Education Act of 1965 established a philosophy of “open admissions” by providing financial aid, special services, and incentives for minority recruitment, resulting in increased numbers of underprepared students. By 1977, over 80% of colleges and universities offered some sort of college preparatory program (Roueche & Snow cited in Boylan, 1988, p. 3). Throughout American postsecondary education
history, a consistent 80% of colleges and universities have met the needs of underprepared students.

In the 1980s, legislatively mandated assessments began. Most states found about 30% of entering students were deficient in at least one basic skill. By 1985, over 90% of community colleges used placement tests; few were used as barriers to entry (Cohen & Brawer, 1996). In the 1990s, approximately 42% of high school students enrolled in college, and of that figure, 29% were enrolled in at least one remedial course. At public 2-year institutions, 41% of first-time freshmen enrolled in one or more remedial courses (National Center for Education Statistics, 1995, p. 3).

**NCES Fall 2000 Study**

The latest study conducted through NCES Postsecondary Education Quick Information System (PEQIS) provided freshman enrollment statistics for Fall 2000 in Title IV degree-granting institutions as well as any changes in remediation from the Fall 1995 study. Between 1995-2000, the study did not find any significant change in enrollment of entering freshman in at least one remedial course (2003, p. iv). The National Center for Education Statistics (2003, p.18) also reported in fall 2000:

- 28% of entering freshman of all ages in all types of degree-granting institutions enrolled in remedial coursework.
- 22% of entering freshman of all ages in all types of degree-granting institutions enrolled in remedial mathematics, 14% in writing, and 11% in reading.
• Among two-year colleges, 20% of entering freshman of all ages were enrolled in remedial reading courses at public institutions compared to 9% at private institutions.

• Among four-year colleges, 6% of entering freshman of all ages were enrolled in remedial reading courses at public institutions compared to only 5% at private institutions.

• 98% of public two-year colleges offered college-level remedial courses compared to 59% to 80% of other types of institutions.

• Public 4-year institutions were significant providers of remedial education (80% vs 59%) compared to private 4-year institutions.

It should be noted that for reporting purposes, private-for-profit institutions are included in the data for private not-for profit institutions since there are few private for-profit institutions in the sample.

Comparison of the NCES remediation studies for Fall 1995 and Fall 2000 indicates no difference in the proportion of freshman enrolled in at least one remedial course; however, there was an increase in restrictions colleges have placed upon students in taking regular courses while enrolled in remedial courses. This type of policy limits access to federal financial aid because the Higher Education Act of 1965 was amended so that students may not be eligible for financial aid if they are solely enrolled in remedial courses or if remediation exceeds one year (NCES, 2003, p. iv). The proportion of institutions reporting more than one year in remedial courses increased from 33 to 40% in the Fall 1995 and Fall 2000 studies, respectively (NCES, 2003, p. iv).
Demographics of Community College Students

The public community college open admission policies have resulted in more diverse demographic student populations. Students of color are provided access to higher education because of remedial programs. The majority of developmental students are white (Boylan et al. cited in Boylan, 1999). Less than one-third are minorities with African-Americans representing the largest group followed by Hispanics. Between 52% to 57% are women; moreover, over 80% are U.S. citizens. Non-citizens participate in developmental reading and writing to attain the skills required to become citizens (Knopp cited in Boylan, 1999). One of five is married and two out of five receive some form of financial aid and almost one in ten is a veteran (Knopp, 1996, p. 3). Also one in three works 35 hours or more per week. According to the National Study of Developmental Education, almost three in five are 24 years old or younger with age ranges from 16 to 60 years old (Boylan et al. cited in Boylan, 1999, p. 3).

As of 2004, the average age of a community college student in the United States dropped to 29.7. The fastest growing categories were students less than 25, increasing overall by 25% in five years. From 1998 to 2004, the American Indian and white students decreased, 13.9% and 3.3% respectively, while African-American and Hispanic increased, 25.7% and 47.9% respectively. The largest percentage increase was in the “not reported” category (580%) because upgraded software allows students to self-select and the current race/ethnicity options do not permit mixed backgrounds. Another remarkable trend is a greater number of students not reporting gender (Armstrong, 1999).
Academic Background of Developmental Students

Research has also been conducted on the academic background of developmental students. Students are identified as underprepared for college by SAT and ACT tests as well as institutional assessment instruments. Nationally, developmental students fall into the bottom half of the score distributions (Boylan, 1999). The American Council on Education states there are exceptions to this finding because 18% of those taking remedial courses have SAT scores around 1000, while 5% have scores above 1200 (Knopp, 1996, p. 4).

The mean cumulative high school grade point average (GPA) for entering remedial students into community colleges was 2.40 and upon completion from a two-year institution, developmental students attained a grade point average of 2.28 (Saxon & Boylan, 1999, p. 6). The NCES (2003) six-year study found a cumulative GPA of 2.42 for women who enrolled in developmental courses compared to 2.84 for those not enrolled. In Florida, the Community College System tracks the performance of its students in the State University System and the mean cumulative GPA has remained stable for both former community college Associate of Arts degree students and state university natives. Florida community college student GPAs have ranged from 2.86 in 1994-95 to 2.97 in 2002-03, and state university student GPAs improved from 2.92 in 1994-95 to 3.03 in 2002-03 (p. 2).

National retention rates for first time enrolled students in developmental courses or programs were higher than the population as a whole. Females are slightly over-represented in the group successfully completing all remedial/developmental courses
attempted. At two-year institutions, 74% of students remained in school at least one year; 67% remained in school at four-year institutions (Boylan, Bonham & Bliss, 1994). Surprisingly, the majority did not leave due to academic standing but for personal reasons.

*Indicators of Success for Developmental Students*

Several studies comparing persistence rates and grade point averages of developmental and non-developmental students have been conducted. For example, Sinclair Community College (1994) found developmental students had higher persistence rates and slightly lower GPAs than non-developmental students. Persistence rates might be higher due to students having to stay in college longer since college preparatory courses delay them from taking college-level courses or persistence may be coupled with feeling more prepared to continue (Walleri, 1987). Kulik, Kulik, and Shwalb (1983) also found remedial programs were related to improved persistence and grade point average; in other words, students placed in remedial tracks persisted longer than students who were not placed in remedial tracks, but as they stayed in school longer trying to overcome basic skill deficiencies, grade point averages declined. As a group, developmental students attempt courses, persist longer but have lower GPAs and fail/withdraw at a higher rate than college-level students (Weissmann et al., 1997). The Illinois Community College Board reported remedial students had higher persistence rates, yet the more remedial courses that a student was required to enroll in, the lower his completion rate (ICCB, 1998). Minnesota community colleges found that persistence rates were higher for developmental course takers than students who failed to enroll in developmental education. Furthermore, persistence rates of developmental course takers were higher
than, or not that different from, those of college-prepared students (Shoenecker, 1996). Michigan’s State Department of Education, analyzing developmental education at its associate degree-granting institutions, found developmental students remained enrolled longer, but non-developmental students had higher GPAs and completed more of the credits attempted (1999). The Michigan study also found students who passed developmental courses were more likely to pass college-level courses. An NCES study (2004) reported 45% of remedial/developmental students were identified as persisters, compared to a little over one-third of non-remedial/developmental students, who were identified as persisters. A significant finding in relation to persistence rates was that 9.3% of the remedial/developmental students were still in school at the end of the study compared to only 3.9% who needed remediation and did not seek remedial help—indicating the need for remediation does have a negative impact on time to degree and a positive one with persistence. Successful remedial/developmental students were more likely to graduate (4.7%) than those who did not complete all remedial/developmental courses attempted.

*Mandatory Placement Testing*

Persistence rates and GPA correlations to persistence rates are not the only kinds of studies conducted to measure successful developmental programs. Several studies focused on mandatory placement and the sequence of developmental courses prior to enrollment in college-level classes. For instance, the Minnesota study, which included the entire population enrolled in its community colleges, found students who completed the developmental course sequence achieved significantly higher ratios of credits earned
to attempted, higher cumulative GPA’s, and higher persistence rates than developmental students who did not take the recommended sequence. The placement test was the College Board’s Descriptive Tests of Language and Mathematics Skills. Students who earned a "D" or who failed a developmental course were excluded from the study since it was assumed treatment had not been administered. More than 22% of the community college students needed developmental reading, yet only 17.4% were placed into a course at those colleges offering reading programs (only 13 out of 22 Minnesota community colleges had reading programs in 1988). Moreover, 2.7% of the developmental students were permitted to choose between a developmental and a college reading course. The strongest indicator of success in the study was in the reading content area, and therefore, it was recommended that efforts to increase compliance in reading course enrollment be undertaken as well as mandatory early completion of all developmental course work. In fact, developmental education improved the success of underprepared students, so their performance was indistinguishable from that of college-prepared students.

The Academic Senate for California Community Colleges conducted a basic skills survey in 1998 and concurred with the Minnesota findings that many students are not retained after assessment for basic skills instruction because they never enroll in the developmental course sequence; more than half of California’s community college freshman needed basic skills courses, but only 29% actually enrolled in basic skills courses (2000). According to the California Chancellor’s Office Fact Book (p.46) less than 25% of basic skill students showed any improvement in basic skills in a three-year
period (1995-1998). California community colleges have no research on why this percentage is so low.

Studies conducted by Johnson County Community College in Overland Park, Kansas, showed a high correlation between mandatory placement testing in reading and English, and overall student academic success as well (Amey & Long, 1998). Mandatory placement testing, followed by requiring developmental students to complete development coursework prior to enrolling in college-level work, is now required by many community colleges. The National Center for Education Statistics examined the high school Class of 1982 college transcripts with degrees earned by 1993. The academic careers of 2.45 million students in more than 2500 institutions were analyzed. Of the students who had earned more than a semester of college credit by 1993, 55% who did not take any remedial courses, and 47% who took only one remedial course, earned bachelor's degrees (Adelman cited in McCusker, 1999, p. 1). However, only 24% who took three or more remedial courses earned bachelor's degrees.

NCES Fall 2004 Study

The latest NCES (2004) study reports the proportion of students requiring remedial reading who earned no postsecondary credentials rose from 57% to 70%; whereas, the proportion of students requiring remedial math who earned no postsecondary credentials rose from 49% to 58% (NCES, 2004, p. 94). Furthermore, 16.6% of those needing only remedial reading obtained a bachelor’s degree. Reading deficiency is an indicator of lower odds in completing any degree (Adelman cited in McCusker, 1999, p. 1).
These studies provide sufficient evidence to suggest that students should be required to remediate, they should not delay the basic skills courses, and those deficient in two or three basic skill areas should not be permitted to take college-level coursework (Weissman, Silk & Bulakowski, 1997). Weissman, Silk and Bulakowski had good, hard data to support the fact that developmental education coursework needs to be mandatory and those with serious skill improvement needs should be enrolled in developmental coursework their first semester. This finding, based on their data, was the strongest policy recommendation from their study. Colleges need to regularly evaluate the educational attainment of remedial students to improve policies and programs to maximize student success since remediation is a growth industry.

Illich and McCallister (2004) conducted a study in Texas at McLennan Community College to examine the practice of allowing students to concurrently enroll in remedial and college-level courses. Their findings showed students concurrently enrolled in remedial and college-level courses under-perform in the college-level classes compared to students who are only enrolled in college-level courses. This effect, however, is limited to only those students who do not successfully complete their remedial courses. Students concurrently enrolled who successfully passed their remedial studies performed as well in their college-level courses as did students who only enrolled in college-level courses (p. 448). In a national survey on remedial education in community colleges, Lewis and Farris (1996) concluded that only 2% of the institutions did not permit students taking college-level courses concurrently with remedial classes (cited in Illich & McCallister, p. 437).
Due to a lawsuit settlement, the State Chancellor’s Office of the California Community Colleges implemented a series of regulations governing the use of placement tests. Colleges were required to gather and report on the predictive validity of the tests. Essentially, colleges had to prove that using the tests to group and place students led to their likelihood of success in a course. Armstrong from San Diego Community College produced a model to explain the variance in course outcomes using test scores, student background data, and instructor differences in grading practices (2000). Armstrong found student dispositional characteristics explain the high proportion of variance in the dependent variables and instructor grading practices make accurate placement more difficult. Dispositional factors included affective, behavioral, and cognitive traits, such as past experiences or performance in school, involvement in school activities, high school GPA, high school preparation, and perceived importance of attending school. Not surprising, the key dispositional factors that were most significant were high school GPA, course load in math and English, and grade in last high school math or English class. A statistically significant relationship existed between course grade and the placement test but not enough to have practical significance. Among full-time instructors, placement test scores were not significantly predictive for final grades. However, entering the instructor’s characteristics (grading policy) accounted for the greatest amount of variance in final grade—17% to 20% (Armstrong, p. 690). Dr. Edward Behrman at National University contends “the amount of variance in the course grade accounted for by scores on content-general reading tests…may be too low to warrant the continued use of these tests to predict success in a particular course (2006, p.42), or at the very least, refining the
placement test so that it becomes a better predictor of success is a better choice than no placement test.

Linda Suciu examined CPT scores and information from questionnaires at Trident Community College in South Carolina to predict success in an introductory mathematics course (1991). By choosing a score to maximize a correct prediction—a score above the cut-off for passing, and a cut-off score below for failing—her prediction of student success ranged from 55% to 72%. Suciu then selected a range of scores which improved the chance of correctly predicting success by leaving only 5.2% to 16.6% of the students in various mathematics courses incorrectly predicted. One notable finding was that completion of assignments and amount of practice correlated positively with success in all the courses. In addition, students 25 years old and older were more frequently successful in developmental mathematics courses than those students under 25. According to Suciu, “Cut-off scores should be chosen in such a way that those predicted to succeed do succeed, while those who are predicted to fail actually fail” (Suciu, 1991, p. 6).

Florida Research in Developmental Education

A number of studies focusing on components contributing to student success in developmental studies, particularly mathematics, have also been conducted in Florida, the site of this proposed study, yet none of the studies addressed looking at particular cut-off scores on placement tests in reading as an essential indicator for successful completion of the highest level college preparatory reading course.

Margaret Cran (1998) examined the correlations between student presage variables and performance on the mathematics subtest of the Florida College Level Academic Skills
Test (CLAST). Cran used data which included the CLAST mathematics subtest scores, entry level mathematics subtest scores, gender, racial-ethnic, and six entry-level test variables (including the CPT) for 4,139 first-time CLAST examinees from the State of Florida database. Cran hypothesized if student presage data could indicate success or failure on the CLAST, the community colleges could identify at-risk students immediately. The strongest relationship was between entry level mathematics scores and CLAST success—a coefficient of determination was 30%. Negative correlations were found for gender and race/ethnicity (p. viii).

Wendy Bush (2001) also examined the relationship of student characteristics to determine if they affected the prediction of student failure in the first college preparatory mathematics courses at a community college. The six factors were high school GPA, gender, ethnicity, CPT scores, enrollment status, and financial aid status. The only significant factor was gender for the pre-algebra course, with females being less likely to fail. And high school GPA and ethnicity were significant predictive variables of failure for Elementary Algebra.

Linda Clemons conducted a study to predict community college student performance on the Florida Basic Skills Exit Test (FBSET) in elementary algebra in a collaborative instruction environment. Clemons explored whether the predictive qualities of the following variables: math anxiety scores, perceived usefulness of mathematics, college placement test scores (CPT), and passing elementary algebra during collaborative instruction could predict eligibility to take the FBSET. Then the study sought to ascertain if any of the variables or a combination of the variables could predict the FBSET score.
Finally, she also wanted to determine if gender had a role in determining the outcome on the exit test. The study involved only one Florida community college examining 238 students who had CPT scores and enrolled for the first time in elementary algebra in spring 2001. Clemons’ data revealed only the CPT score predicted exit test scores; the average CPT scores of completers of elementary algebra were higher than those who did not successfully complete elementary algebra (p. viii).

Pat Smittle designed a study in 1995 to identify predictors of academic performance at Santa Fe Community College in Florida. College academic performance was determined by college GPA at the end of the first college year. Smittle found the strongest relationship with college GPA was the high school GPA (.52). Data revealed a difference in CPT scores, overall high school GPA, and senior year absences for students with higher college GPAs and students with lower college GPAs. Only 23% of the students with high school GPAs below 2.0 earned college GPAs of 2.0 or higher. High school GPA accounted for 13% of the variance; whereas, senior year absences accounted for 15% of the college GPA variance (p. 4). Neither race nor gender was a significant predictor of college GPA.

Transcripts of Florida high school students were analyzed by Jeffrey Roth (2001) to determine if course choice, course load, grades in math and English, overall GPA, the tenth grade standardized test score (GTAT) in math and reading, race, and gender affected performance on the CPT upon entry to community colleges in the fall of 1994. Roth created a High School Performance variable for math and English classes to account for the differences in the number of courses completed, their difficulty level, and course final
grade. The Math High School Performance variable had a larger positive effect on passing the CPT math subtest than GPA or tenth grade scores; whereas, tenth grade scores had the larger effect on CPT reading and writing subtests. Finding that Math High School Performance variable has the larger effect on passing the CPT suggests high school students need to take more challenging math courses, even at the risk of lowering GPAs. In addition, finding that tenth grade scores on the GTAT is the strongest predictor of success in passing the CPT reading and writing subtests may indicate it can be used to predict unpreparedness. However, when controlling for English High School Performance variable, tenth grade scores, and GPA, Blacks and Hispanics did not pass the CPT reading and writing subtests at the same rate as whites. Students taking similar math coursework revealed no racial differences in passing the CPT math subtest.

A recent developmental education survey conducted by the Florida Division of Community Colleges and Workforce Education revealed that there is no consensus among Florida community colleges on current CPT cut-off score ranges. In addition, there is currently no consensus on policies or practices regarding the college-preparatory exit exam. Neither the administration of the exit exam or cut-off scores for passing are standardized. However, sixteen of the twenty-eight community colleges stated students needed a “C” or better to sit for the final exam. Furthermore, only eight community colleges examined subsequent college-level course success and six community colleges are currently initiating or examining tracking mechanisms.

The Florida Division of Community Colleges and Workforce Education Office of Student and Academic Success has provided statistics for a program review of
developmental education using the student database for Fall 2000-01 through 2002-03 (see Table 1). Blacks failed the CPT at a higher percentage (84.11%) than Hispanics (72.24%) and Whites (58.66%); moreover, Blacks had lower passing rates (69.29%) in the highest level college-preparatory course in reading than Hispanics and Whites (70.56% and 75.96%, respectively). However, the three major ethnic groups combined still revealed a failure rate of approximately 28% in the highest level college preparatory reading course. The cohort Other had the best success rate, which may suggest that the ethnic choices on student applications need to be more refined and updated to represent current demographic trends, so that more accurate analysis of student data can be applied.

Table 1

First Time in College (FTIC) Degree-Seeking Students Taking Entry Level Test: College Preparatory Success Report by Ethnicity

<table>
<thead>
<tr>
<th>Cohort by Ethnicity</th>
<th>Total Cohort</th>
<th>Number Failed Entry Level Test</th>
<th>% Failed Entry Level Test</th>
<th>Failed Reading Subtest</th>
<th>Enrolled Any Level Reading</th>
<th>Passed Highest Level Reading</th>
<th>% Passed Highest Level Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacks Non-Hispanic</td>
<td>6,778</td>
<td>5,701</td>
<td>84.11</td>
<td>4,416</td>
<td>3,579</td>
<td>2,480</td>
<td>69.29</td>
</tr>
<tr>
<td>Hispanics</td>
<td>6,818</td>
<td>4,925</td>
<td>72.24</td>
<td>3,253</td>
<td>2,490</td>
<td>1,757</td>
<td>70.56</td>
</tr>
<tr>
<td>Whites</td>
<td>24,869</td>
<td>14,588</td>
<td>58.66</td>
<td>7,421</td>
<td>5,467</td>
<td>4,153</td>
<td>75.96</td>
</tr>
<tr>
<td>Asian/Pacific Islands</td>
<td>1,121</td>
<td>746</td>
<td>66.55</td>
<td>574</td>
<td>402</td>
<td>314</td>
<td>78.11</td>
</tr>
<tr>
<td>American Indian/Alaskan</td>
<td>165</td>
<td>108</td>
<td>65.45</td>
<td>62</td>
<td>47</td>
<td>32</td>
<td>68.09</td>
</tr>
<tr>
<td>Other</td>
<td>450</td>
<td>316</td>
<td>70.22</td>
<td>223</td>
<td>160</td>
<td>132</td>
<td>82.50</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>40,201</td>
<td>26,384</td>
<td>65.63</td>
<td>15,949</td>
<td>12,145</td>
<td>8,868</td>
<td>73.02</td>
</tr>
</tbody>
</table>

A major indicator of success for community colleges is the awarding of degrees. Community colleges award various degrees, which include the associate degree, the associate in applied science, college credit certificate, the applied technology diploma, and the postsecondary adult vocational certificate, which is non-college credit for occupational training.

The Florida student database revealed that only 34.6% (466 out of 1,346) of students who needed only college-preparatory reading courses obtained a degree (see Table 2), compared to 40.7% (4,119 out of 10,114) of students who were college-ready. Students needing all three areas of remediation had the lowest percentage (9.9%) in obtaining a community college degree.

Table 2

<table>
<thead>
<tr>
<th>System Total</th>
<th>Original Number</th>
<th>Cohort Percent</th>
<th>Awards Number</th>
<th>Earned Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Ready</td>
<td>10,114</td>
<td>28.20</td>
<td>4,119</td>
<td>40.70</td>
</tr>
<tr>
<td>Need only Math</td>
<td>7,726</td>
<td>21.60</td>
<td>1,623</td>
<td>21.00</td>
</tr>
<tr>
<td>Reading</td>
<td>1,346</td>
<td>3.80</td>
<td>466</td>
<td>34.60</td>
</tr>
<tr>
<td>Writing</td>
<td>541</td>
<td>1.50</td>
<td>167</td>
<td>30.90</td>
</tr>
<tr>
<td>Need Reading and Math</td>
<td>4,114</td>
<td>11.50</td>
<td>639</td>
<td>15.50</td>
</tr>
<tr>
<td>Reading and Writing</td>
<td>1,318</td>
<td>3.70</td>
<td>322</td>
<td>24.40</td>
</tr>
<tr>
<td>Math and Writing</td>
<td>1,735</td>
<td>4.80</td>
<td>274</td>
<td>15.80</td>
</tr>
<tr>
<td>Need all three areas</td>
<td>8,930</td>
<td>24.90</td>
<td>884</td>
<td>9.90</td>
</tr>
<tr>
<td>Needing any remediation</td>
<td>25,710</td>
<td>71.80</td>
<td>4,375</td>
<td>17.00</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>35,824</td>
<td>100.00</td>
<td>8,494</td>
<td>23.70</td>
</tr>
</tbody>
</table>

The following tables provide information on the success of obtaining a community college degree by ethnicity. In 1999, only 12.9% of FTIC African Americans who had complete placement scores were college ready; whereas, 87.1% needed some type of remediation (see Table 3). Only 6.8% of college ready African Americans obtained a community college degree, and only 3.9% needing any type of remediation obtained a degree. African Americans only needing remediation in reading were the highest percentage of degree earners (11.8%), but the percentages are misleading when the original numbers are considered (e.g. 11.8% represents only 27 students). In addition, those needing all three areas of remediation had the lowest percentage for obtaining a degree (2.1%).

Table 3

*Awards (Degrees) Earned by African Americans*

<table>
<thead>
<tr>
<th>Remediation</th>
<th>Original Number</th>
<th>Cohort Percent</th>
<th>Awards Number</th>
<th>Earned Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Ready</td>
<td>795</td>
<td>12.90</td>
<td>54</td>
<td>6.80</td>
</tr>
<tr>
<td>Need only Math</td>
<td>825</td>
<td>13.30</td>
<td>49</td>
<td>5.90</td>
</tr>
<tr>
<td>Reading</td>
<td>229</td>
<td>3.70</td>
<td>27</td>
<td>11.80</td>
</tr>
<tr>
<td>Writing</td>
<td>76</td>
<td>1.20</td>
<td>7</td>
<td>9.20</td>
</tr>
<tr>
<td>Need Reading and Math</td>
<td>900</td>
<td>14.60</td>
<td>36</td>
<td>4.00</td>
</tr>
<tr>
<td>Reading and Writing</td>
<td>284</td>
<td>4.60</td>
<td>22</td>
<td>7.70</td>
</tr>
<tr>
<td>Math and Writing</td>
<td>263</td>
<td>4.30</td>
<td>10</td>
<td>3.80</td>
</tr>
<tr>
<td>Need all three areas</td>
<td>2,810</td>
<td>45.50</td>
<td>59</td>
<td>2.10</td>
</tr>
<tr>
<td>Needing any remediation</td>
<td>5,387</td>
<td>87.10</td>
<td>210</td>
<td>3.90</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>6,182</td>
<td>100.00</td>
<td>264</td>
<td>4.30</td>
</tr>
</tbody>
</table>

A larger percentage (22.5%) of FTIC Hispanics who had complete placement scores were college ready as compared to African Americans, but this percentage represents a student population which is almost double that of African Americans. Hispanics needing any type of remediation (77.5%) resulted in only 5.9% obtaining community college degrees (see Table 4). Only 11.2% of the college ready Hispanics obtained a community college degree, and only 5.9% needing any form of remediation obtained a degree. Hispanics only needing remediation in reading were the highest percentage of degree earners (12.1%). In addition, those needing all three areas of remediation had the lowest percentage for obtaining degrees (3.3%).

Table 4

*Awards (Degrees) Earned by Hispanics*

<table>
<thead>
<tr>
<th>Remediation</th>
<th>Original Number</th>
<th>Cohort Percent</th>
<th>Awards Number</th>
<th>Earned Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Ready</td>
<td>1,390</td>
<td>22.50</td>
<td>156</td>
<td>11.20</td>
</tr>
<tr>
<td>Need only Math</td>
<td>1,164</td>
<td>18.80</td>
<td>90</td>
<td>7.70</td>
</tr>
<tr>
<td>Reading</td>
<td>280</td>
<td>4.50</td>
<td>34</td>
<td>12.10</td>
</tr>
<tr>
<td>Writing</td>
<td>99</td>
<td>1.60</td>
<td>11</td>
<td>11.00</td>
</tr>
<tr>
<td>Need Reading and Math</td>
<td>804</td>
<td>13.00</td>
<td>48</td>
<td>6.00</td>
</tr>
<tr>
<td>Reading and Writing</td>
<td>298</td>
<td>4.80</td>
<td>23</td>
<td>7.70</td>
</tr>
<tr>
<td>Math and Writing</td>
<td>262</td>
<td>4.20</td>
<td>12</td>
<td>4.60</td>
</tr>
<tr>
<td>Need all three areas</td>
<td>1,893</td>
<td>30.60</td>
<td>63</td>
<td>3.30</td>
</tr>
<tr>
<td>Needing any remediation</td>
<td>4,800</td>
<td>77.50</td>
<td>281</td>
<td>5.90</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>6,190</td>
<td>100.00</td>
<td>437</td>
<td>7.10</td>
</tr>
</tbody>
</table>

In Table 5, Whites needing any type of remediation (65.7%) resulted in only 5.7% obtaining community college degrees, which was similar to the percentage of Hispanics (5.9%). Whites needing only remediation in reading resulted in 10.1% receiving awards, while those needing both reading and mathematics resulted in 5.9% obtaining a degree. In addition, those needing all three areas of remediation had the lowest percentage for obtaining degrees (3.5%).

Table 5

*Awards (Degrees) Earned by Whites*

<table>
<thead>
<tr>
<th>Remediation</th>
<th>Original Number</th>
<th>Original Percent</th>
<th>Awards Number</th>
<th>Earned Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Ready</td>
<td>7,523</td>
<td>34.30</td>
<td>712</td>
<td>9.50</td>
</tr>
<tr>
<td>Need only Math</td>
<td>5,512</td>
<td>25.10</td>
<td>355</td>
<td>6.40</td>
</tr>
<tr>
<td>Reading</td>
<td>724</td>
<td>3.30</td>
<td>73</td>
<td>10.10</td>
</tr>
<tr>
<td>Writing</td>
<td>334</td>
<td>1.50</td>
<td>36</td>
<td>10.80</td>
</tr>
<tr>
<td>Need Reading and Math</td>
<td>2,262</td>
<td>10.30</td>
<td>133</td>
<td>5.90</td>
</tr>
<tr>
<td>Reading and Writing</td>
<td>572</td>
<td>2.60</td>
<td>37</td>
<td>6.50</td>
</tr>
<tr>
<td>Math and Writing</td>
<td>1,161</td>
<td>5.30</td>
<td>50</td>
<td>4.30</td>
</tr>
<tr>
<td>Need all three areas</td>
<td>3,832</td>
<td>17.50</td>
<td>133</td>
<td>3.5</td>
</tr>
<tr>
<td>Needing any remediation</td>
<td>14,397</td>
<td>65.70</td>
<td>817</td>
<td>5.70</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>21,920</td>
<td>100.00</td>
<td>1,529</td>
<td>7.00</td>
</tr>
</tbody>
</table>


In Table 6, comparisons are made with college preparatory students by ethnicity that only needed reading and obtained a community college degree with college ready students by ethnicity who obtained a degree. Table 6 was created by combining Tables 3, 4, and 5 to provide information on the total of the three ethnic groups, which was not provided by The Division of Community Colleges and Workforce Education Office of
Student and Academic Success. Examining the results when all three ethnic groups are combined reveals very few students who only need college preparatory reading earn a community college degree.

Table 6

*Comparison of Awards Earned by College Ready and College Preparatory Reading Students*

<table>
<thead>
<tr>
<th>FTIC degree seeking taking Entry Level Test</th>
<th>College-Ready Reading Only Awards Earned With Reading</th>
<th>College-Ready Awards Earned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black/NonHispanic Hispanic</td>
<td>795 (12.90%)</td>
<td>27 (11.80%)</td>
</tr>
<tr>
<td></td>
<td>1,390 (22.50%)</td>
<td>34 (12.10%)</td>
</tr>
<tr>
<td>White</td>
<td>7,523 (34.30%)</td>
<td>73 (10.10%)</td>
</tr>
<tr>
<td>Total of 3 ethnic groups</td>
<td>9,708 (28.00%)</td>
<td>134 (10.80%)</td>
</tr>
<tr>
<td>Total Cohort</td>
<td>34,292 (~100%)</td>
<td></td>
</tr>
</tbody>
</table>

Associate Vice Chancellor for Evaluation Dr. Patricia Windham of the Division of Community Colleges and Workforce Education provided analysis of the degrees earned by college preparatory students within various ranges of CPT reading scaled scores. The CPT reading scaled score of 83 means a student is exempt from taking a college-preparatory course in reading. Combining the scaled scores from 83 to 120 (11,601 out of 27,626 students), the percentage of students passing the CPT-R is 41.9%. The remaining two ranges are students (58%) who are required to take one or more courses in college-preparatory reading. And within those two ranges, only 14.8% of
students obtained a degree. Students who were exempt from taking reading had the highest percentage (22.4%) of earning a degree. Entering calculations for the total cohort finds the overall percentage of students attaining community college degrees was 18% while 27% were still enrolled at a university and 40.3% were employed, which is defined by the Florida Department of Education as academically successful (see Table 7). The success rates are calculated through a formula which includes the total number of students, the number of students who graduated, were still enrolled in good standing, or left in good standing.

Table 7

Fall 1997 First Time in College Freshman CPT-Reading Scaled Scores

<table>
<thead>
<tr>
<th>Scaled Scores</th>
<th>Number of Students</th>
<th>Awards Earned (%)</th>
<th>Transfer to SUS (%)</th>
<th>Awards Transfer (%)</th>
<th>or Still Enrolled (%)</th>
<th>Success (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-50</td>
<td>3,513</td>
<td>12.7</td>
<td>347</td>
<td>9.9</td>
<td>219</td>
<td>6.2</td>
</tr>
<tr>
<td>51-82</td>
<td>12,512</td>
<td>45.3</td>
<td>2,030</td>
<td>16.2</td>
<td>1,370</td>
<td>10.9</td>
</tr>
<tr>
<td>83-100</td>
<td>8,714</td>
<td>31.5</td>
<td>1,908</td>
<td>21.9</td>
<td>1,264</td>
<td>14.5</td>
</tr>
<tr>
<td>101-120</td>
<td>2,887</td>
<td>10.5</td>
<td>691</td>
<td>23.9</td>
<td>420</td>
<td>14.5</td>
</tr>
<tr>
<td>Total</td>
<td>27,626</td>
<td>100.0</td>
<td>4,976</td>
<td>18.0</td>
<td>3,273</td>
<td>11.8</td>
</tr>
</tbody>
</table>

Note. First Time in College (FTIC) Student Database for Fall 1997-1998 through 2001-2002 and various Performance Based Program Budgeting files created from the State University System (SUS) Student Data Course File. Success is measured by employment, based on fall 2001 follow-up of the Original Cohort by Florida Education and Training Placement Information Program.

Cooling-Out Function of Community Colleges

Burton Clark’s institutional case study of San Jose Junior College, The Open Door College, was instrumental in prompting researchers to examine the long-term educational attainments of community college entrants (Diel, 2001). Clark (1960) stated that the junior colleges provided a “cooling-out” function in which counseling, testing,
and other policies are devices to subtly convince “incompetent” students who wish to transfer to give up their original goals and pursue an alternative terminal vocational program; thus, the community college served as a screening device, a gatekeeper, in effect, for 4-year institutions. Brint and Karabel (1989) concurred with Clark by detailing the ways occupational and vocational programs have expanded in community colleges to hinder the transfer function of the community college and subsequently encourage students to opt out of a baccalaureate transfer program of study. Several studies in the 1970s and 1980s revealed that merely being at a community college rather than a 4-year institution reduces the probability that a student will obtain a bachelor’s degree (Deil, 2001).

However, many community colleges today are not barriers to student success. Deil’s (2001) research findings indicate a “warming-up” pattern among students attending community colleges. Faculty who are committed to the transfer mission of the college plus support systems such as tutoring and small class size provide positive support towards attainment of a bachelor’s degree. Deil claimed the community college thus provides “pockets of opportunity” since the priority is transfer; consequently, the student defines success as the attainment of a bachelor’s degree (Deil, 2001, p. 7). Thus, Deil recommended a study should be conducted to evaluate placement test scores as indicators for successful completion of college preparatory courses to ascertain whether or not low scores are a fundamental barrier to a student pursuing a two-year or four-year degree.
Summary

In 1998-99, there were 76,960 community college students enrolled as first-time-in-college (FTIC). By 2003-04, FTIC students increased to 102,201—an increase of 33% (Armstrong, 2004, p. 6). In addition, more students are in the 17-24 years old range, which is an increase of 25% in the last five years (Armstrong, 2004, p. 1). Although the exact percentages vary, slightly one-third of FTIC are college-ready, another one-third need one remedial course, and the final third need two or more remedial courses (Armstrong, 1999 p. 1). The NCES (2004) study indicated only 16% of students who were assigned remedial reading courses completed bachelor’s degrees, compared to 58% of students who were not required to take any remedial courses. However, Florida students who were assigned remedial reading courses completed bachelor’s degrees at a higher percentage (17.5%) (Armstrong, 2005). Furthermore, Florida reported a significantly lower percentage (25.4%) of students obtaining bachelor’s degrees than the national percentage reported in the NCES study (58%).

The Florida Department of Education released information on the 2000-2001 cohort of FTIC degree-seeking students who failed the entry test in reading, writing or mathematics. A majority (65.63%) of students failed at least one entry level test. Comparing the success rates for remedial reading students in attaining a two-year or four-year degree to those not needing remediation in reading suggests that the placement test should not be used only as criteria for placement into developmental courses, but also as a screening device to permit admission counselors to advise students with very low basic skill levels of other career choices that do not require traditional college programs of
study. Studies of persistence rates and course completion rates provide only a snapshot of community college students who were successful. This study examined variables at the beginning of a program of study to identify whether or not a student should even seek a college degree.
Chapter 3

Methods

With student enrollments in higher education increasing throughout Florida, traditional four-year institutions are turning away students who are college level ready, resulting in community colleges facing unprecedented enrollments not only in traditional college classes, but also remedial instruction. However, an ethical dilemma exists—should community colleges continue to place underprepared students into remediation knowing the negative effects on retention rates and matriculation while turning away students who are college-ready? Should they welcome students who are seriously underprepared and not inform them that their time and money may be expended with very little possibility of ever graduating?

As described in chapter two, reading has been found to be the primary indicator of successfully completing a college program of study; therefore, the purpose of this study was to examine the predictive validity of several variables to determine if the Florida Computerized Placement Test - Reading (CPT-R) score alone, or other variables, could determine whether or not a student would successfully pass the highest level college preparatory reading course. The study examined only the reading scores on the CPT to determine at what standard deviation below the cutoff score of 83 a student could still successfully complete the highest level college preparatory reading course. Smittle
(1993) studied both the concurrent and predictive validity of the CPT-R and was able to suggest a cut-off score of 83 on the CPT-R, representing college-reading ability, the score at which a student would be exempt from taking the highest preparatory reading course. Concurrent research suggests the score of 83 equates to a 12th grade reading level on the Nelson Denny Reading Test as well as the Directed Reading Program (Napoli & Raymond, 1998, p. 3). For the community college’s open-door policy to be effective, reliable placement and diagnostic procedures need to be employed to identify and determine student needs.

Research Questions and Hypotheses

Therefore, this study attempted to answer the following questions with the hypotheses tested at the .05 level of significance.

1. Is there a relationship between a student’s score on the Computerized Placement Test in reading (CPT-R) and success in passing the highest level college preparatory reading course in Florida?

2. Is there a relationship between full-time or part-time enrollment during the semester a student is taking the highest level college preparatory reading course and success in passing the highest level college preparatory reading course in Florida?

3. What are students' GPAs the session following successful completion of the highest level college preparatory reading course according to the program track (Associate of Arts, Associate of Science, Associate of Applied Science)?
The null hypothesis of this research study for question one is that there was no relationship between the CPT-R score and a student successfully passing the highest level college preparatory reading course. Likewise, the null hypotheses for the variables full-time enrollment and part-time enrollment, was there was no relationship between these variables and a student successfully passing the highest level college preparatory reading course. A student who was enrolled in twelve semester hours in the fall or spring sessions was a full-time student. A student who was enrolled in less than twelve semester hours was a part-time student. The null hypothesis for question three was there was no relationship between the GPA and the student’s successful completion of the highest level college preparatory course in reading, according to program track.

Successful completion, or course satisfaction, of the college preparatory reading course is the final course mark that is considered passing. For purposes of this study, pass/fail will be used as the variable representing passing grades of “A”, “B”, “C”, “S”, or “P.” A grade of “W” means a withdrawal from a course and is not computed in the GPA. A grade of “W” does not override a grade of “F.” The instructor may also enter an “I,” which is an incomplete for a course, and an “I” received at the end of any term becomes an “F” if not completed the succeeding fall or spring term. The student may not register for another section of the course during the period of the incomplete grade. A grade of “N” is used only in college preparatory courses and may be assigned to students earning a “D” or “F” in a college preparatory course. The grade of “N” is non-punitive, indicating progress has been made but not at the level required for successful completion of the course. College-preparatory courses are not computed in a student’s GPA.
Procedures

Analysis of archived student scores for fall sessions 1997-2004, approximately 35,000 scores per year \( (n = 276,079) \) for all forms of the CPT-R were carried out to determine the success of students whose exit scores (i.e. 81, 82) were clustered around the 83 cut-off score as well as how many standard deviations below the cut-off score a student could successfully pass the highest level college reading preparatory course. Successful completion of the highest level college preparatory reading course included students who passed during the fall session of each year in the study. Other variables such as full-time or part-time enrollment and the student’s GPA the semester following successful completion of the highest level college-preparatory reading course were evaluated to determine if any relationship exists with passing the highest level preparatory reading course.

Participants/Data Collection

The sample for the study was first-time enrolled Florida community college freshman. Variables included CPT-R scores, enrollment status, the student’s GPA the semester following successful completion of the highest level college preparatory reading course, and the program tracks A.A. (Associate of Arts), A.S. (Associate of Science) and A.A.S. (Associate of Applied Science) of the students passing the highest level college preparatory reading course from the Florida Student Database, fall sessions 1997-2004.

Variables

In the first analysis, CPT-R scores were the independent, continuous variable and the final grade in the highest level college preparatory reading course was the dependent,
categorical variable. In the second analysis, enrollment status was an independent, categorical variable and the final grade in the highest level college preparatory reading course was the dependent, categorical variable. Enrollment status was coded as a dichotomous variable using a “1” for full-time and a “0” for part-time enrollment. Passing or failing the highest level college preparatory course in reading was a dependent, categorical variable; passing the course was coded as “1” and failing the course was coded as “0.” In the third analysis, the GPA the semester following successful completion of the highest level college preparatory reading course was an dependent, continuous variable, and passing or failing the highest level college preparatory reading course was an independent categorical variable along with the three program tracks of A.A. (Associate of Arts), A.S. (Associate of Science) and A.A.S. (Associate of Applied Science).

Instrumentation

The NCES Fall 2000 study revealed that 57 to 61% of all postsecondary institutions administer placement tests. In July, 1993, the Florida Department of Education solicited proposals for testing products for a common placement testing program. The College Entrance Examination Board won the contract in December, 1993. The initial contract required core placement tests in reading, writing and elementary algebra as well as additional tests for lower and higher level mathematics. The College Entrance Examination Board and the Educational Testing Service proposed using the Computerized Placement Test™(CPT) which was part of the ACCUPLACER system. The computerized adaptive testing technique customizes tests according to each student’s
ability. Each student is presented with a series of test questions at an appropriate level of difficulty for the student’s abilities, knowledge, and background. Easy and difficult questions are avoided, and accurate results are obtained with fewer questions and no time limit. Institutions that do not have computer testing labs are provided with written versions.

The Florida postsecondary institutions implemented the test in July 1995, with permission to delay full-scale implementation for one year. The tests are used primarily in Florida’s public community colleges. The State Board of Education established minimum passing scores for each subtest, permitting individual institutions to set higher passing scores. However, by June 30, 1997, all community colleges were required to adopt uniform standards. The standards include a reading comprehension standard score of 83 or higher, which exempts a student from taking a developmental reading course. Ranges also exist within each subsection for placement into different levels of developmental reading, writing and mathematics. Furthermore, in 1996, the Florida Legislature amended Section 240.117 of the Florida Statues to permit the common placement test to be administered to high school tenth-grade students.

The results of the common placement tests are not reported the same way as statewide tests. An annual report is prepared to describe the number of students who are placed into developmental studies by institution and each student’s test scores are recorded in the database maintained by the Division of Community Colleges. In the fall of 1998, 30,063 students who took the Florida CPT and subsequently enrolled in the highest level college preparatory reading course had an average CPT reading score of 63.
CPT Predictive Validity

The College Board’s Computerized Placement Test (CPT) has high levels of statistical reliability as well as content and construct validity (Napoli & Raymond, 1998). Internal reliability (alpha=.90) and test-retest reliability (r=.90) are both high (CEEB cited in Napoli & Raymond, 1998, p. 3). Clemons reported a .92 reliability estimate for the CPT (2002, p. 47). Content and construct validity means that the test contains a representative sample of items of what it purports to measure—reading comprehension skills. CPT reading scores (CPT-R) have been found to be accurate in repeated tests and consistent across items (CEEB cited in Napoli & Raymond, 1998). The items on the reading subset were selected by reading specialists from a larger group of items presented by an advisory committee of experts in reading. The specialists defined the chosen set of items as representative of college-level skills in reading, resulting in the reading subtest having content and construct validity.

The CPT-R is used nationwide at 350 colleges and universities; however, the criterion-related validity has not been thoroughly examined. Criterion-related validity consists of concurrent validity—the degree to which scores on two or more subtests measure the same thing—and predictive validity—the degree to which scores predict performance (Anastasi cited in Napoli & Raymond, 1998). In this case, the CPT-R’s concurrent validity is measured by the degree to which scores on the test correlate with other tests measuring reading skills, and predictive validity is measured by how accurately the test predicts future reading performance. Either concurrent validity or predictive validity (or both) determines the level of criterion-related validity.Criterion-
related validity permits the test to be used as a reliable assessment tool for placement and curriculum decisions. Napoli examined the predictive-validity of the CPT-R by using overall college grade point average and performance in introductory psychology classes, which were used as criterion variables. Significant correlations existed between CPT-R scores and course grades ($r = .52$) and between CPT-R scores and overall grade point average ($r = .41$). Furthermore, the study was successful in identifying specific cutoffs on the CPT-R distribution as predictive of successful and unsuccessful academic outcomes (Napoli, 1998, p. 2). However, norm-referenced tests which includes the CPT-R, reveals little more than the relative position of each test-taker on the score distribution.

In 1993, Pat Smittle studied both predictive and concurrent validity of the CPT subtests in reading comprehension, sentence skills, arithmetic and algebra against the ACT to establish the criterion-validity of each subtest. Smittle found the CPT tests were better predictors of overall academic performance in college than the ACT tests. The CPT reading subtest was more discriminating among levels of reading competency than the ACT’s composite reading placement test, thus establishing the CPT reading subtest’s concurrent validity with another norm-referenced test. According to the College Entrance Examination Board the primary function of the CPT is to determine which course placements and whether or not students need remedial studies (CEEB cited in Smittle, 1995, p. 2). Smittle also was able to suggest a cut-off score on the reading subtest (83) which represented college-level reading ability and placed the same percentage of students at each course level as those previously placed at those levels using the traditional paper and pencil tests (cited in Napoli & Raymond, 1998).
In 1995, Murphy examined the construct and predictive validity of the CPT reading subtest to the three subscores of the Nelson Denny Reading tests. Using a sample size of 663 college students, significant correlations were found between the CPT-R and the Nelson Denny Vocabulary section ($r = .69$). The Nelson Denny provides grade-equivalents to reading scores. However, the grade-level score assignments still needed validation.

Napoli and Raymond continued the assessment of the criterion-related validity of the CPT by examining the concurrent validity of the CPT-R and the Degrees of Reading Power (DRP). The study’s goal was to create a grade-level equivalency table, allowing for the conversion of CPT-R scores to valid reading grade levels. The DRP test, through extensive studies, has demonstrated high levels of reliability (KR-20 = .95) and construct validity and criterion-related validity (Koslin cited in Napoli & Raymond, 1998). The DRP scores are converted into grade specific readability levels from 4th grade through 12th grade and first-year college levels. Results from the study found that a substantial correlation exists between the DRP and the CPT-R. The CPT-R has a high degree of reliability and validity to identify basic reading proficiency skills necessary for first-year college-level textbooks. The study not only affirms Smittle’s previous college-level cut point of 83, but also equates specific CPT-R scores with expected grade-level performance.

The Standard Error of Estimate predicting DRP grade level performance from CPT-R is equal to $\pm 1.27$. In addition, the study also replicated the CPT-R grade-level equivalencies produced in Murphy’s 1995 analysis of the Nelson Denny Reading Tests.
Since generalizations resulting from this study are limited by the nature of the sample—community college students’ scores—further studies should be conducted before assuming these results can be used for other types of institutions.

Data Analysis

Using the Statistical Analysis System (SAS) for this study, descriptive and inferential statistics were obtained. Descriptive statistics included central tendency, (mean, mode, and median) variability (standard deviation, variance, and range) and distribution (skewness and kurtosis) of the incoming freshman CPT-R scores, full-time or part-time enrollment, subsequent GPAs with success in passing the highest level college-preparatory reading course. Relationships were examined using correlations (interval level or higher) for statistical significance between the independent variable of CPT-R score, enrollment status and GPAs with the variable passing/failing the highest level college preparatory reading course. The consideration of how final grades are reported was not a concern since in order to pass the highest level preparatory reading course, a student must not only pass the course based on instructor’s evaluations, but must also pass the Florida Basic Skills Exit Test; therefore, this dependent variable was entered as pass/fail. The statistical software program, SAS was used to generate frequency distributions and calculate means and standard errors for all quantitative variables.

Passing or failing the highest level college preparatory reading course based on placement test scores and enrollment status creates a binary response. The validity of interpretation of the results depended on the design of the study; therefore, a logistic
regression analysis was used. The odds of passing the highest level college-preparatory reading course was expressed as:

\[
\text{odds} = \frac{P}{1 - P} \quad \text{(passing)}
\]

The simple logistic regression equation with the independent variable \( X \) (full/part-time) is:

\[
\text{logit} (P) = a + bX
\]

The dependent logistic transformation of the odds, known as “logit,” is the dependent variable of passing or failing the highest level college-preparatory reading course. The assumption is the relation between the logit \((P)\) and \( X \) is linear. Similar to a simple linear regression, \( b \) is the expected change of logit \((P)\) with a unit change in \( X \). Therefore when \( b \) is positive, increases in \( X \) means increases in logits. When \( b \) is negative, increases in \( X \) means decreases in logits.

There are three acceptable data formats for logistic regression; however, the raw data format using LOGISTIC procedure in SAS yielded the richest information for this study (Peng & So, 2002).

Evaluations of the logistic regression model included the overall model evaluations, statistical tests of individual predictors, goodness-of-fit statistics, and validations of predicted probabilities. The inferential statistics included the likelihood ratio, distributed as chi-square with degrees of freedom equal to the number of predictors \((df = 1)\). The descriptive statistics included Akaike Information Criterion and Schwarz Criterion to compare two different models from the same sample. Statistical tests of
individual predictors providing individual parameter estimates was tested by the likelihood ratio. The goodness-of-fit statistics assessed the fit of the logistic model against the data. The validations of predicted probabilities determined to what degree predicted probabilities match with actual outcomes, using measures of association and/or a classification table. The measure of association for this study was Somer’s D statistic and the $c$ statistic. The classification table was a two-way classification table, which minimized the bias of using same observations in both model-fitting and predicting probabilities.

A logistic regression model was used to test the null hypothesis because the criterion variable (passing or failing the highest level college-preparatory reading course) was dichotomous instead of continuous. Furthermore, a logistic regression discerned the relationship between the criterion variable and multiple predictor variables (CPT-R scores, full-time enrollment and part-time enrollment), taken independently. The student’s GPA is a continuous interval variable.

A logistic regression is valid with retrospective data -- college placement scores. Therefore, analysis was run with the full logistic regression model. Predictor variables included CPT-R scores, full-time and part-time status, to determine if a significant relationship existed with the criterion variable.

Before concluding that the null hypothesis was not rejected, those predictor variables with a $p$-value less than 0.05 were selected to explain the data. If a variable had a $p$-value less than 0.05, then a logistic regression model was used to test the relationship
between the variable and the criterion variable. If a positive slope was obtained then a relationship existed between the selected variable and the criterion variable.

Descriptive and inferential statistics were also obtained. Descriptive statistics included central tendency (mean, mode, and median), variability (standard deviation, variance, and range) and distribution (skewness and kurtosis) of the GPA with respect to which program track the student was in with success in passing or not passing the highest level college preparatory reading course. Relationships were examined using correlations (interval level or higher) for statistical significance between passing the highest level college preparatory reading course and the GPA.

A one-way analysis of variance (ANOVA) for the third question was used to test the null hypothesis that there was no relationship between a student passing the highest level college preparatory reading course, the independent, categorical variable and the student’s GPA (dependent, continuous variable) the following session. The program track was also included in this analysis of the GPAs, testing for differences in the means of the dependent variable broken down by the levels of the independent variable.

Summary

Chapter 3 outlined the methods used to examine the research questions. The study included the Florida Student Database from Fall Sessions 1997-2004. The researcher tabulated the results of the data to determine relationships between the variables.
Chapter 4

Results

The rising cost of attending four-year colleges, the increase in college-bound high school students, and a larger number of nontraditional students have resulted in an increasing number of students enrolling in community colleges nationwide. Cliff Adelman, Senior Research Analyst at the U.S. Department of Education, reported approximately 63% of the students entering community colleges require at least one remedial course (2004). According to Adelman, “Deficiencies in reading skills are indicators of comprehensive literacy problems, and they significantly lower the odds of a student’s completing a degree” (1996, p. A56). The National Center for Education Statistics Fall 2000 study reported the students requiring remediation in reading and who did not earn postsecondary credentials rose from 57% in 1982 to 70% in 1992. This problem could be alleviated if the placement test was used as a screening tool, rather than just for placement purposes into developmental classes because “…we cannot let students believe they have a good chance of earning a college degree if they leave high school with poor reading skills” (Adelman,1996, p.A57).

The purpose of this study was to examine the predictive validity of several variables to determine if the Florida Computerized Placement Test - Reading (CPT-R)
score alone, or other variables, could determine whether or not a student would successfully pass the highest level college preparatory reading course.

The study examined the reading scores on the CPT to determine at what standard deviation below the cutoff score of 83 (exempt from reading) a student could still successfully complete the highest level college preparatory reading course. A scaled score of 83 means the student has attained a 70% on the reading portion of the placement test. Concurrent research suggests the score of 83 equates to a 12th grade and college-level reading level on the Nelson Denny Reading Test as well as the Directed Reading Program (Napoli & Raymond, 1998, p.3). Community college counselors could use this information to make decisions about which students to admit to college programs of study.

Since the Fall of 1997, Florida community colleges have used the College Board’s Computerized Placement Test; therefore, the data included first time in college (FTIC) Florida community college freshman reading scores ($n = 276,079$) for Fall 1997 through Fall 2004. The study attempted to answer the following questions with the hypotheses tested at the .05 level of significance.

1. Is there a relationship between a student’s score on the Computerized Placement Test in reading (CPT-R) and success in passing the highest level college preparatory reading course in Florida?

2. Is there a relationship between full-time or part-time enrollment during the semester a student is taking the highest level college preparatory reading course
and success in passing the highest level college preparatory reading course in Florida?

3. What are students' GPAs the session following successful completion of the highest level college preparatory reading course according to the program track (Associate of Arts, Associate of Science, Associate of Applied Science)?

Chapter 4 will discuss: (a) data collection, (b) data analysis, (c) descriptive statistics (d) findings related to question one that investigated whether or not there was a relationship between reading placement test scores and successful completion in the highest level college preparatory reading course, (e) findings related to question two which investigated with full or part time enrollment was related to whether or not a student successfully completed the reading course, (f) findings related to question three which investigated whether or not there was a relationship of successfully completing the reading course and the grade point average the following session, according to program track, and (g) chapter summary.

Data Collection

The data for this study was obtained from Associate Vice Chancellor for Evaluation Dr. Patricia Windham of the Florida Division of Community Colleges and Workforce Education in March 2006. Variables included Computerized Placement Test (CPT-R) scores in reading for Fall 1997 through Fall 2004, enrollment status (full or part time), the student’s GPA the semester following successful completion of the highest level college preparatory reading course, according to program tracks A.A. (Associate of Arts), A.S. (Associate of Science) and A.A.S. (Associate of Applied Science) and
students’ final marks in the reading course. Only students who took the placement test in the fall and then enrolled in the highest level college preparatory reading course were used in the study to ensure the performance on the placement test had no intervening variable such as other courses requiring reading where a student may have had extensive tutoring to improve reading performance that would inadvertently affect the level of course performance in the reading course. Identity variables were not included, so students could not be individually identified. The researcher adhered to the University of South Florida’s Institutional Review Board (IRB) policies and procedures for the protection of human subjects. The Statistical Analysis System SAS version 9.1 (SAS, 2002) was used to analyze the data. Using an alpha level of .05, logistic regression was conducted for questions 1 and 2, and an analysis of variance ANOVA for question 3. The review of the literature revealed no previous studies have examined these research questions.

**Data Analysis**

Analysis of archived student scores for the years 1997-2005, which was approximately 35,000 scores per year \((n = 276,079)\) for all forms of the CPT-R, were carried out to determine the success of students whose exit scores (i.e. 81, 82) were clustered around the state of Florida’s 83 cut-off score. In addition, the researcher also examined how many standard deviations below the cut-off score a student could successfully pass the highest level in the college reading preparatory sequence. Using SAS, descriptive and inferential statistics were obtained. Descriptive statistics included
central tendency (mean, mode, and median), variability (standard deviation, variance, and range), and distribution (skewness and kurtosis) of the incoming freshman CPT-R scores.

**Descriptive Statistics**

The Computerized Placement Test in reading yields scaled scores ranging from 0 to 120. A scaled score is a statistical conversion of raw scores, the actual items missed, on the placement test. Scaled scores report comparable results when different test forms are used over time; thus, scaled scores provide performance standards.

For this study, descriptive statistics were obtained first using the entire sample and then using only students who were required to take the reading course. A scaled score of 83 means the student has attained a 70% on the reading portion of the placement test and is exempt from the reading course; however, the mean score for all students taking the reading placement test and entering Fall 1997 through Fall 2004 ($n = 276,079$) was 64, with a standard deviation of 13.6. The mode, the most frequently obtained score, was 75 which equates to approximately 62% of the items correct on the CPT-R (Table 8); therefore, students are entering college with inadequate reading skills.

Table 8

**FTIC Students Reading Computerized Placement Test Scores Fall Sessions 1997-2004**

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Range</th>
<th>Kurtosis</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>276,079</td>
<td>64</td>
<td>67</td>
<td>75</td>
<td>13.60</td>
<td>185.29</td>
<td>119</td>
<td>+0.62</td>
<td>-0.84</td>
</tr>
</tbody>
</table>

*Note: Florida First Time in College (FTIC) Student Database ($n=276,079$) for Fall sessions 1997-2004 using SAS.*
The kurtosis was +.62 and the skewness was -0.84, resulting in an approximately normal distribution. Five students had perfect scores of 120. The .25 quartile revealed scaled scores of 57 or lower and the .75 quartile had scaled scores of 74 or higher (Figure 1).

**Figure 1.** Histogram and boxplot of all FTIC students reading placement test scores.

Note: Florida First Time in College (FTIC) Student Database (n=276,079) for Fall Sessions 1997-2004 using SAS.

The researcher created a frequency chart (Table 9) to calculate the percentage of students who passed the reading course in both quartiles, and found both groups performed somewhat the same.
Table 9

Comparison of Upper and Lower Quartiles Reading Placement Scaled Scores with Passing Rates for Students Taking the Highest Level College Preparatory Reading

<table>
<thead>
<tr>
<th>CPT –R Scaled Scores</th>
<th>Number of Students</th>
<th>Students Passing Reading Course</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Quartile: &gt;=74</td>
<td>79,167</td>
<td>49,281</td>
<td>61%</td>
</tr>
<tr>
<td>Lower Quartile: &lt;=57</td>
<td>72,289</td>
<td>40,891</td>
<td>59%</td>
</tr>
</tbody>
</table>

Note: Florida First Time in College (FTIC) Student Database (n=276,079) for Fall Sessions 1997-2004 using SAS.

Furthermore, students whose scaled scores ranged from 11-20 may include students who had adequate reading skills, but decided while taking the placement test to refrain from completing it and just enroll in the reading course, which might help explain the 74% passing rate (Table 10). In addition, only 50% of the 3,845 students who obtained a scaled score of 83 or higher on the CPT-R test, which does not require a reading course, passed the highest college preparatory reading course. Students who are exempt from taking the reading course still take the course for a variety of reasons, but usually the primary reason is to refresh their reading skills. And yet this does not explain why the passing rates are so low and also incongruous, suggesting extraneous factors other than a reading placement test score contribute to a student’s success in the course.
Table 10

*Frequency of Reading Placement Test Scores and Passing Rates in Reading Course for Fall Sessions 1997–2004*

<table>
<thead>
<tr>
<th>Scores</th>
<th>Frequency</th>
<th>Passed</th>
<th>% Passed</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10</td>
<td>88</td>
<td>61</td>
<td>69%</td>
<td>27</td>
</tr>
<tr>
<td>11-20</td>
<td>1112</td>
<td>831</td>
<td>74%</td>
<td>281</td>
</tr>
<tr>
<td>21-30</td>
<td>4649</td>
<td>2036</td>
<td>43%</td>
<td>2605</td>
</tr>
<tr>
<td>31-40</td>
<td>13,896</td>
<td>7148</td>
<td>51%</td>
<td>6748</td>
</tr>
<tr>
<td>41-50</td>
<td>22,683</td>
<td>13,108</td>
<td>57%</td>
<td>9575</td>
</tr>
<tr>
<td>51-60</td>
<td>46,437</td>
<td>27,580</td>
<td>59%</td>
<td>18,857</td>
</tr>
<tr>
<td>61-70</td>
<td>79,219</td>
<td>48,628</td>
<td>61%</td>
<td>30,591</td>
</tr>
<tr>
<td>71-80</td>
<td>90,652</td>
<td>56,797</td>
<td>62%</td>
<td>33,855</td>
</tr>
<tr>
<td>81</td>
<td>6981</td>
<td>4450</td>
<td>63%</td>
<td>6049</td>
</tr>
<tr>
<td>82</td>
<td>6515</td>
<td>4051</td>
<td>62%</td>
<td>2531</td>
</tr>
<tr>
<td>83</td>
<td>402</td>
<td>218</td>
<td>52%</td>
<td>184</td>
</tr>
<tr>
<td>84-90</td>
<td>1694</td>
<td>826</td>
<td>48%</td>
<td>870</td>
</tr>
<tr>
<td>91-100</td>
<td>1368</td>
<td>686</td>
<td>50%</td>
<td>682</td>
</tr>
<tr>
<td>101-110</td>
<td>328</td>
<td>178</td>
<td>54%</td>
<td>150</td>
</tr>
<tr>
<td>111-120</td>
<td>53</td>
<td>35</td>
<td>66%</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>276,079</td>
<td>166,633</td>
<td>60%</td>
<td>109,446</td>
</tr>
</tbody>
</table>

*Note:* First time in college (FTIC) with Complete Placement Scores (*n* = 276,079) and Florida database Fall sessions 1997-2004 using SAS.

For this study, however, since scores of 83 or higher did not require enrollment in a reading course, those scores were not included in future analysis; resulting in a sample size of 272,232 students. Because the number of students whose scores were 83 or higher was relatively small, the mean score did not change. The mode, the most frequently obtained score, was 75 (Table 11).
Table 11

Computerized Placement Test Reading Scores for Students Required to Enroll in the Reading Course

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Range</th>
<th>Kurtosis</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>272,232</td>
<td>64</td>
<td>67</td>
<td>75</td>
<td>13.30</td>
<td>177.08</td>
<td>81</td>
<td>0.57</td>
<td>-0.97</td>
</tr>
</tbody>
</table>

*Note: First Time in College (FTIC) Student Database (n=272,232) which does not include students scoring 83 or higher) for Fall sessions 1997-2004 using SAS.

The kurtosis was 0.57 and the skewness was -0.97, resulting in a negatively skewed distribution. The extreme observations were five students who scored an 82.

The .25 quartile revealed scaled scores of 57 or lower and the .75 quartile contained scaled scores of 74 or higher (Figure 2).

Figure 2. Histogram and boxplot of reading placement test scores of students required to enroll in the reading course.

* may represent up to 945 students

*Note: First Time in College (FTIC) Student Database (n =272, 232) for Fall 1997-2004 using SAS.
Successful completion of the highest level college preparatory course in reading means the student actually took the course and was awarded a grade of A, B, C, P (pass) or S (satisfactory). A grade of WP (withdrawal pass) was not included as successful completion of the course since the student tested out of the course prior to taking the course. As shown in Table 12, 272,232 students who scored 82 or below placed in the highest level college preparatory course in reading and 164,690 students (60.50%) passed with grades of A, B, C, S, or P, which means that 107,542 students (39.50%) did not pass the reading course. Even though this course is not averaged into the grade point average, 41.5% of community college instructors preferred to enter a grade of A, B, or C, revealing the actual level of student performance in the course. The designation of satisfactory performance (S) was 17.01% or 46,298 students. Students who obtained a grade entered as “P” for passing was 1.74% or 4,642 students.
### Table 12

*Frequency of Grades for Students Required to Enroll in the Reading Course*

<table>
<thead>
<tr>
<th>Grades</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>29,155</td>
<td>10.71</td>
<td>29,155</td>
<td>10.71</td>
</tr>
<tr>
<td>B</td>
<td>51,169</td>
<td>18.80</td>
<td>80,324</td>
<td>29.51</td>
</tr>
<tr>
<td>C</td>
<td>33,326</td>
<td>12.24</td>
<td>113,650</td>
<td>41.75</td>
</tr>
<tr>
<td>P (pass)</td>
<td>4,742</td>
<td>1.74</td>
<td>118,392</td>
<td>43.49</td>
</tr>
<tr>
<td>S (satisfactory)</td>
<td>46,298</td>
<td>17.01</td>
<td>164,690</td>
<td>60.50</td>
</tr>
<tr>
<td>D</td>
<td>6,161</td>
<td>2.26</td>
<td>170,851</td>
<td>62.76</td>
</tr>
<tr>
<td>F</td>
<td>14,898</td>
<td>5.47</td>
<td>185,749</td>
<td>68.23</td>
</tr>
<tr>
<td>I (incomplete)</td>
<td>1,369</td>
<td>0.50</td>
<td>187,118</td>
<td>68.73</td>
</tr>
<tr>
<td>PR (progress need to re-enroll in course)</td>
<td>11,545</td>
<td>4.24</td>
<td>198,663</td>
<td>72.97</td>
</tr>
<tr>
<td>U (unsatisfactory)</td>
<td>8,571</td>
<td>3.15</td>
<td>207,234</td>
<td>76.12</td>
</tr>
<tr>
<td>W (withdrawal)</td>
<td>29,517</td>
<td>10.84</td>
<td>236,751</td>
<td>86.96</td>
</tr>
<tr>
<td>WF (withdraw fail)</td>
<td>912</td>
<td>0.34</td>
<td>237,663</td>
<td>87.30</td>
</tr>
<tr>
<td>WP (withdraw pass)</td>
<td>335</td>
<td>0.12</td>
<td>237,998</td>
<td>87.42</td>
</tr>
<tr>
<td>X (no institutional grade awarded)</td>
<td>34,208</td>
<td>12.57</td>
<td>272,206</td>
<td>99.99</td>
</tr>
<tr>
<td>Z (audit, no credit)</td>
<td>26</td>
<td>0.01</td>
<td>272,232</td>
<td>100.00</td>
</tr>
<tr>
<td>Total passing</td>
<td>164,690</td>
<td>60.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: FTIC students from Florida database Fall sessions 1997-2004 (n=272,232) using SAS.*

### Research Question 1

Is there a relationship between a student’s score on the Computerized Placement Test in reading (CPT-R) and success in passing the highest level college preparatory reading course in Florida?

The null hypothesis for question one is that there is no relationship between the CPT-R score and a student successfully passing the highest level college preparatory reading course. The validity of interpretation of the results depended on the design of the study; therefore, a logistic regression analysis was used for research question one because the independent variable, test scores, was continuous and the dependent variable,
successful completion of the reading course was coded as pass or fail, a dichotomous variable. The odds of passing the highest level college-preparatory reading course was expressed as:

\[
\text{odds} = \frac{P}{1 - P}
\]

Results for a logistic regression are interpreted like a regression since the researcher is questioning whether there is a relationship between placement test scores and success in completing the reading course; thus, logistic regression fits an intercept/slope model. The dependent logistic transformation of the odds, known as “logit” is the dependent variable of passing or failing the highest level college-preparatory reading course. The assumption is that the relation between the logit (P) and x is linear. Similar to a simple linear regression, \( b \) is the expected change of logit (P) with a unit change in x. Therefore, when \( b \) is positive, increases in x affects increases in logits.

The odds ratio for question one is 1.009, meaning for every one point increase on the reading portion of the placement test, the log odds of passing the reading course increases by .00907 (Table 13). An odds ratio close to 1.0 suggests that there is no change due to the predictor variable. The Confidence Interval (CI) for the proportional odds ratio lies between 1.009 and 1.010 and since it does not include 1, the researcher must reject the null hypothesis (p< 0.05) that there is no relationship between student scores and successful completion of the reading course.
Table 13

Odds Ratio Estimates

<table>
<thead>
<tr>
<th>Effect</th>
<th>Point Estimate</th>
<th>95% Wald Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Test Scores</td>
<td>1.009</td>
<td>1.009</td>
</tr>
</tbody>
</table>

Note: FTIC students from Florida database Fall sessions 1997-2004 (n=272,232) using SAS.

The analysis of maximum likelihood estimates (Table 14) provides detailed analysis on the variable of placement test scores.

The intercept and the slope (Table 14) for the simple logistic regression (chi-square = 64.59, p <.0001) with the independent variable x (scaled reading scores on the placement test) was:

\[
\text{logit (P)} = a + bx
\]

\[
\text{Log odds} = -.1534 + .00907*(x)
\]

if \( x=1 \) then

\[
\text{Log odds} = -.1443
\]

\[
\text{Odds} = e^{-1.443} = .85
\]

\[
\text{Probability} = \frac{\text{odds}}{1+\text{odds}}
\]
Table 14

*Analysis of Maximum Likelihood Estimates*

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ($b_0$)</td>
<td>-0.1534</td>
<td>0.0191</td>
<td>64.5949</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Placement Test ($b_1$)</td>
<td>0.00907</td>
<td>0.000293</td>
<td>958.6788</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Odds $e^{-1.4433}$

*Note*: Florida database for FTIC Fall sessions 1997-2004 ($n=272, 232$) using SAS Logistic.

For example, if a student scores a 54 on the reading placement test, the probability of passing the reading course is 58%; whereas, if a student scores an 82 on the reading placement test, the probability of passing the reading course is 64%. The “$x$” in the above equation would be replaced by 54 or 82, respectively (Table 15).

Table 15

*Logistic Regression Model for Probability of Successful Completion of Reading Course*

<table>
<thead>
<tr>
<th>Placement Score</th>
<th>Log Odds</th>
<th>Odds</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>.336</td>
<td>1.40</td>
<td>.58</td>
</tr>
<tr>
<td>82</td>
<td>.590</td>
<td>1.80</td>
<td>.64</td>
</tr>
</tbody>
</table>

*Note*: FTIC students from Florida database Fall sessions 1997-2004 ($n=272, 232$) using SAS.

The validations of predicted probabilities determined to what degree predicted probabilities match with actual outcomes, using measures of association. The measure of association for this study was Somers’ D statistic and the $c$ statistic, which assesses the quality of the model based on sample size and the independent variable (Table 16). Somer’s D is used to determine the strength and direction of the relation between the pairs of variables. Values range from -1.0 (where all pairs disagree) to 1.0 (where all
pairs agree). Therefore it equals the difference between the percent concordant and the percent discordant divided by 100. The Concordant was approximately 52%. The higher the percent means the better the predictive power of the model. The model is statistically significant.

Table 16

Assocation of Predicted Probabilities and Observed Responses

<table>
<thead>
<tr>
<th>Percent Concordant</th>
<th>Percent Discordant</th>
<th>Somer’s D</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>51.9</td>
<td>45.6</td>
<td>.063</td>
<td>.532</td>
</tr>
</tbody>
</table>

Note: Florida database for FTIC Fall sessions 1997-2004 (n = 272, 232) using SAS.

For a logistic regression with high predictive accuracy, the receiver operator characteristic (ROC) curve should rise quickly so that the area under the curve is large for a model with high predictive accuracy. The ROC curve is a traditional method for showing the relationship between sensitivity and the false positive rate. In other words, if the ROC curve rises slowly and has smaller area under the curve, then the logistic regression model has low predictive accuracy. The c test, which provides an estimate of the area under the ROC curve was only .53 (perfect association is 1.0).

The null hypothesis for research question one is that there was no relationship between the CPT-R score and a student successfully passing the highest level college preparatory reading course. This hypothesis can be rejected (p<.0001); in other words, there is a statistically significant relationship between the students’ placement test reading scores and their successfully completing the highest level college preparatory reading course; however, the effect is very small. The placement test score is not an
essential indicator of whether or not a student will successfully complete the highest level college preparatory reading course.

Research Question 2

Is there a relationship between full-time or part-time enrollment during the semester a student is taking the highest level college preparatory reading course and success in passing the highest level college preparatory reading course in Florida?

The null hypothesis for the variable full-time enrollment (twelve or more semester hours) and part-time enrollment was there was no relationship between this variable and a student successfully passing the highest level college preparatory reading course. In terms of student numbers, there was no remarkable difference in the number of students who attended college on a full-time basis compared to those who attended on a part-time basis. There were 7.71% more part time students than full time students attending (Table 17). The descriptive statistics for enrollment status, which was coded as a “1” for full-time and “0” for part-time, does not lend itself to interpretation because it was a nominal variable and therefore has no mean, mode, or median.
Table 17

*Frequency of Enrollment for Fall Sessions 1997 – 2004*

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>106,790</td>
<td>39.23</td>
<td>106,790</td>
</tr>
<tr>
<td>Part-time</td>
<td>127,799</td>
<td>46.94</td>
<td>234,589</td>
</tr>
<tr>
<td>S*</td>
<td>37,620</td>
<td>13.82</td>
<td>272.209</td>
</tr>
<tr>
<td>Z*</td>
<td>23</td>
<td>0.01</td>
<td>272,232</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>272,232</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Students categorized as “S” were enrolled in the summer term and students categorized as “Z” are not enrolled for the fall session; both categories were not part of the analysis. Note: Florida database for FTIC Fall sessions 1997-2004 (n=272,232) using SAS.

The odds ratio for enrollment status to successful completion of the highest level college preparatory reading course was 1.059 with Wald 95% confidence intervals for the odds ratios of 1.042 – 1.076. Since “1” is not included in the confidence interval, enrollment status is associated with success in the course (Table 18), but the association is very small.

Table 18

*Odds Ratio Estimates*

<table>
<thead>
<tr>
<th>Effect</th>
<th>Point Estimate</th>
<th>95% Wald Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Test Scores</strong></td>
<td>1.059</td>
<td>1.042</td>
</tr>
</tbody>
</table>

*Note: FTIC students from Florida database Fall sessions 1997-2004 (n=272,232) using SAS.*
The simple logistic regression equation with the independent variable \( x \) (full or part-time enrollment) was: 

\[
\log \text{odds} = +.4037 + .0573 \times x
\]

The dependent logistic transformation of the odds, known as “logit,” is the dependent variable of passing or failing the highest level college-preparatory reading course.

Similar to a simple linear regression, \( b \) is the expected change of logit (P) which is either full-time or part-time enrollment (Table 19). Since full time was coded as “1” then the logistic model becomes \(.4037 + .0573 \times 1\), which equates to \(.4610\) (Table 19). If a student is part time then the value of \( x \) becomes “0” and the equation then equals \(.4037\).

Table 19

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Estimate</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept ( (b_0) )</td>
<td>.4037</td>
<td>.00502</td>
<td>6473.1961</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Full or Part-time ( (b_1) )</td>
<td>.0573</td>
<td>.00804</td>
<td>50.8253</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

Note: Florida database for FTIC Fall sessions 1997-2004 \((n=272, 232)\) using SAS.

If a student is full time then the probability of passing the reading course is 61%, whereas, a part time student has a 60% probability of passing the course (Table 20).

\[
\text{Odds} = e^{+.4610} = 1.585
\]

\[
\text{Probability} = \frac{1.585}{2.585} = .61
\]
Table 20

*Logistic Regression Model for Probability of Successful Completion of Reading Course*

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Log Odds</th>
<th>Odds</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time</td>
<td>.46</td>
<td>1.585</td>
<td>61%</td>
</tr>
<tr>
<td>Part time</td>
<td>.40</td>
<td>1.497</td>
<td>60%</td>
</tr>
</tbody>
</table>

*Note: Florida database for FTIC Fall sessions 1997-2004 (*n* = 272, 232) using SAS.*

The validations of predicted probabilities determined to what degree predicted probabilities match with actual outcomes, using measures of association. The measure of association for this study was Somers’ D statistic and the *c* statistic, which assesses the quality of the model based on sample size and the independent variable (Table 21). The Concordant was approximately 25%. The higher the percent means the better the predictive power of Wald (*p* < .0001) which was statistically significant. The model is statistically significant and may be attributed to whether a student is full-time or part-time since the area under the ROC curve is significant.

Table 21

*Association of Predicted Probabilities and Observed Responses*

<table>
<thead>
<tr>
<th>Percent Concordant</th>
<th>Percent Discordant</th>
<th>Somers’ D</th>
<th><em>c</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>24.5</td>
<td>23.1</td>
<td>.014</td>
<td>.507</td>
</tr>
</tbody>
</table>

*Area under the receiver operator characteristic curve ROC curve

*Note: Florida database for FTIC Fall sessions 1997-2004 (*n* = 272, 232) using SAS.*
Research Question 3

The final research question examined if there was a difference in grade point averages of students who successfully completed the highest level college preparatory reading course and the program of study they chose.

What are students' GPAs the session following successful completion of the highest level college preparatory reading course according to the program track (Associate of Arts, Associate of Science, Associate of Applied Science)?

The null hypothesis for question three was there was no relationship between the grade point average (GPA), according to program track the subsequent session, and the student’s successful completion of the highest level college preparatory course in reading. An ANOVA was performed followed by a Tukey test (alpha=.05) which indicated a significant difference in the group means of the three program tracks, meaning there is some effect of successfully completing the reading course and obtaining a higher GPA in an Associate of Applied Science program track, rather than an Associate of Science or Associate of Arts program track. The GPA averages were somewhat different, but there was not a marked difference. Apparently, the highest GPA was in the A.A.S. program (2.40), yet most students declared an A.A. program of study with a slightly lower GPA of 2.33.

Students self report a program of study on the college application for admission. Students either select a specific program of study or indicate they are undecided. For the purposes of this study, only students who declared a major are represented. The State of
Florida codes the majors as follows: A.A. = 0, A.S. = 1 and A.A.S. = A. Furthermore, the data set only contained students who completed the course with an A, B, C, or S.

Descriptive statistics were obtained for reading grades, grade point averages and programs of study for the 35,102 students who identified a program of study. The frequency of grade assignment (Table 22) revealed approximately 39% of students with a declared program of study were assigned a grade of “B”.

Table 22

*Frequency of Grades for Successful Completion of Reading for Fall Sessions 1997-2004*

<table>
<thead>
<tr>
<th>Grades</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8,436</td>
<td>24</td>
<td>8,436</td>
<td>24</td>
</tr>
<tr>
<td>B</td>
<td>13,574</td>
<td>39</td>
<td>22,010</td>
<td>63</td>
</tr>
<tr>
<td>C</td>
<td>7,493</td>
<td>21</td>
<td>29,503</td>
<td>84</td>
</tr>
<tr>
<td>S</td>
<td>5,599</td>
<td>16</td>
<td>35,102</td>
<td>100</td>
</tr>
</tbody>
</table>

*Note:* Florida database for FTIC Fall sessions 1997-2004 (n =272, 232) using SAS.

Actual semester grade point averages for the session following successful completion of the reading course were available from the Florida student database. All grade point averages were according to a 4.0 grade scale (Table 23). The researcher only included students earning an A, B, C, or S. Descriptive statistics included central tendency, (mean, mode, and median) variability (standard deviation, variance, and range) and distribution shape (skewness and kurtosis). The kurtosis was -0.17 and the skewness was -0.58, resulting in an approximately normal distribution.
Table 23

Descriptive Statistics of Grade Point Averages the Session Following FTIC Students’ Successful Completion of Reading Course Fall Sessions 1997-2004

<table>
<thead>
<tr>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Range</th>
<th>Kurtosis</th>
<th>Skewness</th>
</tr>
</thead>
<tbody>
<tr>
<td>34,896</td>
<td>2.33</td>
<td>2.50</td>
<td>3.00</td>
<td>1.03</td>
<td>1.05</td>
<td>4.00</td>
<td>-0.17</td>
<td>-0.58</td>
</tr>
</tbody>
</table>

Note: Florida database for FTIC Fall sessions 1997-2004 (n=272, 232) using SAS.

Figure 3. Histogram and boxplot of grade point averages the session following successful completion of reading course.

<table>
<thead>
<tr>
<th>Grade Point Averages</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1+</td>
<td>1880</td>
</tr>
<tr>
<td>.**</td>
<td>144</td>
</tr>
<tr>
<td>3.7+</td>
<td>1186</td>
</tr>
<tr>
<td>.**</td>
<td>1888</td>
</tr>
<tr>
<td>3.3+</td>
<td>1954</td>
</tr>
<tr>
<td>.**</td>
<td>4874</td>
</tr>
<tr>
<td>2.9+</td>
<td>845</td>
</tr>
<tr>
<td>.**</td>
<td>2833</td>
</tr>
<tr>
<td>2.5+</td>
<td>2809</td>
</tr>
<tr>
<td>.**</td>
<td>2508</td>
</tr>
<tr>
<td>2.1+</td>
<td>4528</td>
</tr>
<tr>
<td>.**</td>
<td>596</td>
</tr>
<tr>
<td>1.7+</td>
<td>1516</td>
</tr>
<tr>
<td>.**</td>
<td>1310</td>
</tr>
<tr>
<td>1.3+</td>
<td>1012</td>
</tr>
<tr>
<td>.**</td>
<td>1606</td>
</tr>
<tr>
<td>0.9+</td>
<td>274</td>
</tr>
<tr>
<td>.**</td>
<td>384</td>
</tr>
<tr>
<td>0.5+</td>
<td>354</td>
</tr>
<tr>
<td>.**</td>
<td>193</td>
</tr>
<tr>
<td>0.1+</td>
<td>2202</td>
</tr>
</tbody>
</table>

* may represent up to 102 counts and missing 206 observations

Note: Florida database for FTIC Fall sessions 1997-2004 (n=272, 232) using SAS.

The .25 quartile revealed a grade point average of 1.75 or lower and the .75 quartile contained grade point averages of 3.0 or higher (Figure 3).

Only 35,102 students out of 272, 232 students declared a major, which means only 13% of first time in college freshman declared a major in the Fall sessions of 1997-2004 (Table 24). There were 206 missing grade point averages, so the total grade point averages reported for program levels was 34, 896.
Table 24

*Frequency of Program Levels*

<table>
<thead>
<tr>
<th>Program-Level</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Frequency</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.A.</td>
<td>27,328</td>
<td>77.85</td>
<td>27,328</td>
<td>77.85</td>
</tr>
<tr>
<td>A.S.</td>
<td>5,887</td>
<td>16.77</td>
<td>33,215</td>
<td>94.62</td>
</tr>
<tr>
<td>A.A.S.</td>
<td>1,887</td>
<td>5.38</td>
<td>35,102</td>
<td>100.00</td>
</tr>
</tbody>
</table>

*Note:* Florida database for FTIC Fall sessions 1997-2004 (*n* = 272,232) using SAS.

Most students chose the Associate of Arts program track and the grade point averages of the three programs of study were not remarkably different (Table 25).

Table 25

*Mean Grade Point Averages According to Program of Study*

<table>
<thead>
<tr>
<th>Program Level</th>
<th><em>n</em></th>
<th>Mean</th>
<th>Mode</th>
<th>Skewness</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.A.S.</td>
<td>1,880</td>
<td>2.40</td>
<td>3.00</td>
<td>-0.62</td>
<td>1.03</td>
<td>1.07</td>
<td>-0.07</td>
</tr>
<tr>
<td>A.A.</td>
<td>27,154</td>
<td>2.33</td>
<td>3.00</td>
<td>-0.58</td>
<td>1.00</td>
<td>1.00</td>
<td>-0.10</td>
</tr>
<tr>
<td>A.S.</td>
<td>5,862</td>
<td>2.27</td>
<td>3.00</td>
<td>-0.53</td>
<td>1.12</td>
<td>1.26</td>
<td>-0.50</td>
</tr>
</tbody>
</table>

*Note:* Florida database for FTIC Fall sessions 1997-2004 (*n* = 272,232) using SAS.

A one-way analysis of variance (ANOVA) was used to test the null hypothesis that there was no relationship between the student’s GPA (dependent, continuous variable) the following session, and a student passing the highest level college preparatory reading course, the independent, categorical variable, according to program of study. ANOVA is the method for comparison of three or more groups and has the advantage of testing whether or not a difference occurs between the groups. The
hypothesis was that all three program tracks have the same population mean; no
difference existed between the three groups’ GPAs.

The $F$ statistic and $p$-value rejected the null ($F=13.65, p<.0001$), indicating
differences in the means between the three groups (Table 26).

Table 26

*Analysis of Program Level to Grade Point Averages*

<table>
<thead>
<tr>
<th>Source</th>
<th>$Df$</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
<th>$F$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>2</td>
<td>28.67</td>
<td>14.33</td>
<td>13.65</td>
</tr>
<tr>
<td>Error</td>
<td>34,893</td>
<td>36,663.77</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Corrected</td>
<td>34,893</td>
<td>36,692.45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34,895</td>
<td>36,692.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note:* Florida database for FTIC Fall sessions 1997-2004 ($n=272, 232$) using SAS

The follow up test, the Tukey test (alpha = .05) indicated a significant difference in
the group means (Table 27) of all three program tracks ($p<.05$). The ANOVA was robust
to the assumption of homogeneity of variance. Even though the groups were not equal in
size, the variances among the three groups were somewhat the same. In addition, the
assumption for the independence of observations may not have been met due to
instructors’ current grading practices. Professors each have individual biases on how they
evaluate their courses and how students’ grades are assigned. Based on the descriptive
statistics in Table 25 and what is known about the robustness of ANOVA (Cody & Smith,
1997) there appears to be no substantial violation to the normality or equal variance
assumption. There is likely some relationship between a student successfully passing the reading course in a specific program track and the GPA the following session.

Table 27

*Tukey's Studentized Range (HSD) Test for Grade Point Averages*

<table>
<thead>
<tr>
<th>Program Level</th>
<th>Difference Between Means</th>
<th>95% Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.A.S. – A.A.</td>
<td>0.063090</td>
<td>0.005794</td>
</tr>
<tr>
<td>A.A.S. – A.S.</td>
<td>0.125673</td>
<td>0.061994</td>
</tr>
<tr>
<td>A.A. – A.S.</td>
<td>0.062583</td>
<td>0.027981</td>
</tr>
</tbody>
</table>

*Note:* Florida database for FTIC Fall sessions 1997-2004 (*n* = 272, 232) using SAS

Although the GPA averages were somewhat different, there was not a marked difference. The highest GPA was in the A.A.S. program, yet most students declared an A.A. program of study with a slightly lower GPA of 2.33.

*Summary*

The study revealed there was a statistically significant relationship between students’ scores on the reading component of the CPT and successful completion of the highest level college preparatory reading course. However, the research does not identify any one particular scaled score which would provide information on how many standard deviations below the scaled score of 83, which is the cut-off score not requiring the reading course, a student could still successfully complete the highest level college preparatory course in reading (Figure 4.) It appears that students can still pass the highest level college preparatory reading regardless of the scaled score on the placement test.
Figure 4. Fall sessions 1997-2004: Comparison of percentage of students passing reading course and corresponding CPT-R scaled score ranges.

Note: Florida database for FTIC Fall sessions 1997-2004 (n = 272, 232) using SAS.

Furthermore, results of the study revealed students who successfully complete the course are attaining grade point averages the following session that meet the requirements for maintaining academic standing, an indication that many of the students may stay in school and complete a program of study.
Chapter 5

Summary of Findings, Conclusions, and Implications for Theory, Practice, and Research

Community colleges are committed to welcoming all students to participate; however, planning a program of study so students are successful requires a placement test to identify deficiencies. The purpose of the study was to investigate whether there was a significant correlation between student test scores on the reading component of the Computerized Placement Test (CPT-R) and successful completion of the highest level college preparatory reading course, offered by community colleges in the state of Florida. Furthermore, this study examined whether or not full-time or part-time status had a relationship to a student successfully completing the highest level college preparatory reading course. In addition, this study examined the association between successfully completing the highest level college preparatory reading course and the grade point average (GPA) in college studies the following session, according to program track (Associate of Arts, Associate of Science, Associate of Applied Science).

Method Summary

The data for this study was obtained from Associate Vice Chancellor for Evaluation Dr. Patricia Windham of the Florida Division of Community Colleges and Workforce Education in March 2006. Various statistical techniques including logistic regression and ANOVA were used to study the data and analyze the results.
Descriptive Data

The sample for the study included students who enrolled for the first time at one of the twenty-eight Florida community colleges during the Fall terms of 1997-2004, scored 82 or lower on the reading portion of the computerized placement test and enrolled in the highest level college preparatory reading course \( (n = 272,232) \). Table 28 depicts the number of participants who enrolled in the reading course during the fall sessions with the central tendencies of mean, median and mode.

Table 28

**Fall Sessions 1997-2004 Computerized Placement Test-Reading Scaled Score Comparisons**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Students</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>27,883</td>
<td>62</td>
<td>65</td>
<td>68</td>
</tr>
<tr>
<td>1998</td>
<td>30,063</td>
<td>63</td>
<td>66</td>
<td>75</td>
</tr>
<tr>
<td>1999</td>
<td>33,782</td>
<td>64</td>
<td>67</td>
<td>75</td>
</tr>
<tr>
<td>2000</td>
<td>30,892</td>
<td>65</td>
<td>68</td>
<td>75</td>
</tr>
<tr>
<td>2001</td>
<td>35,211</td>
<td>65</td>
<td>68</td>
<td>75</td>
</tr>
<tr>
<td>2002</td>
<td>44,037</td>
<td>62</td>
<td>66</td>
<td>69</td>
</tr>
<tr>
<td>2003</td>
<td>35,434</td>
<td>65</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td>2004</td>
<td>38,777</td>
<td>65</td>
<td>68</td>
<td>71</td>
</tr>
</tbody>
</table>

*Note: Fall 1997-2004 first time in college (FTIC) with Reading Placement Scores \( (n = 272,232) \).*

Students self-report a program of study on the college application for admission. Students either select a specific program of study or indicate they are undecided. For the purpose of this study only students who declared a major are represented. The State of Florida codes the majors as follows: A.A. = 0, A.S. = 1, and A = A.A.S. Completion with a grade of A, B, or C was considered successful completion of the course since the State
of Florida considers only these letter grades as passing and was coded as “1” for passing, and “0” for not passing. Actual semester grade point averages were available from the Florida student records database. All grade point averages were computed using a 4.0 grade scale.

Summary of Findings

Using quantitative analysis techniques, this study explored three research questions, each of which is presented below with a summary of the findings for each question.

Research Question 1

Is there a relationship between a student’s score on the Computerized Placement Test in reading (CPT-R) and success in passing the highest level college preparatory reading course in Florida?

Using SAS Logistic regression, the researcher determined a relationship did exist between scores on the CPT in reading and successful completion of the reading course. Students with higher reading placement scores had greater odds of passing the reading course. For every point scored on the reading placement test, the log odds of passing the course increased by .00907. The likelihood ratio test associated with logistic regression provided the evaluation of the statistical significance of the relationship of the placement test in reading and success in the reading course. However, even though the odds ratio indicated a student had a better probability of passing the reading course as scaled scores increased, the change in probability was very small. The reality is that, between the years 1997-2004, 40% of students, regardless of their placement test score, failed the reading course. Even students identified as passing the placement test and therefore not required
to enroll in the reading course failed the reading course. Students with scaled scores below 10 passed the reading course. The placement test scores, therefore, are not indicative of whether or not a student will successfully complete the reading course. Determining how many standard deviations below the cut-off score of 83 cannot be determined from this study.

Research Question 2

Is there a relationship between full-time or part-time enrollment during the semester a student is taking the highest level college preparatory reading course and success in passing the highest level college preparatory reading course in Florida?

The results demonstrated that students who are identified needing reading may be more successful with a full-time program of studies. If a student is full time, then the probability of passing the reading course is 61% whereas a part time student has a 60% probability of passing the course. While the difference may be statistically significant, the difference is very small; the actual comparison suggests part time students are just as likely to pass the course as full time students.

Research Question 3

What are students' GPAs the session following successful completion of the highest level college preparatory reading course according to the program track (A.A., A.S., A.A.S.)?

An ANOVA procedure followed by a Tukey Studentized Test looked for differences among the three program tracks. The assumptions of normality, homogeneity
of variance, and independence of observations were met. The quantitative analysis showed differences among the means of the three programs of study were statistically significant. However, the differences reflected reveal only slight variations in grade point averages (GPAs). Students in an A.A.S. program had slightly higher GPAs than students in an A.A. or A.S. program. Only 35,102 students who successfully completed the reading course had declared a program of study and had GPAs. Of that aggregate, 39% of those students were assigned a grade of “B” in the highest level college preparatory reading course. Twenty-four percent received “A’s,” 21% obtained “C’s” and 16% received an “S,” satisfactory completion.

Conclusions

The study was conducted to determine whether or not a placement test could be an essential indicator of student success in the highest level college preparatory reading course. Although studies have been conducted on placement testing and its relationship to developmental mathematics courses, the researcher found no studies have been done to determine if the CPT reading test had a relationship to the reading course.

The sample \(n = 272,232\) consisted of first-time-in-college Florida community college students who were required to take the highest level college preparatory reading course. Statistically significant relationships were found between the entry test and successful completion of the reading course. Students declaring an Associate of Applied Sciences program of study achieved GPAs somewhat higher than students declaring an Associate of Science or Associate of Arts program of study.
The study revealed that students who were exempt from the reading course because of their placement test scores, and still took the course, did not have higher passing rates in the course. Also students with higher placement scores did not have particularly higher passing rates in the reading course than students with lower placement scores. In fact, descriptive results revealed students who obtained CPT reading scores in the 11-20 scaled score range had a 74% passing rate in the reading course, which was 24 points higher than the 91-100 scaled score range (50%), a range not requiring enrollment in the reading course.

According to the College Board, the 83 scaled score, which exempts a student from taking the reading course, equates to 70% on the paper/pencil version of the test, yet the study revealed that the scaled score 64 was the average score for Fall sessions 1997-2004, which according to previous studies equates to 9/10\textsuperscript{th} reading grade level on the Nelson-Denny Reading Test (Napoli & Raymond, 1998). In addition, the most frequently obtained scaled score was 75 from Fall sessions 1997-2004, which equates to an 11\textsuperscript{th} grade reading level on the Nelson-Denny Reading Test; however, the results of this study showed only 61% (49,281 out of 79,167) of the upper quartile of students (scaled scores >74) passed the highest level college preparatory reading course. It is essential to conclude Florida high schools need to implement intensive programs of study in reading because students are gravely underprepared for college studies.

Results of the study suggest passing the reading course is significant toward maintaining good academic standing, which ensures a student generally can continue in a program of study. The placement test may only be one of several essential indicators that
would determine if a student would be successful in the reading course. More importantly, however, successfully completing the reading course is an indication the student may well finish a program of study since grade point averages the session following successful completion of the reading course indicated students were able to on average obtain grade point averages permitting continuance in their program of studies.

Limitations

The study was delimited to developmental programs in the Florida Community College System. Only students who took the Florida College Entry-Level Placement Test (CPT) in the fall session and subsequently enrolled in the highest level college reading preparatory course were included in the study. The state of Florida considers assigned grades of A, B, or C as passing grades in the reading course. It was assumed the CPT provides an accurate assessment of the student’s reading ability.

Implications for Theory

According to the results of this study, placement tests scores have a significant relationship to student success in the reading course. Other essential indicators (e.g. persistence, high school courses) including nonacademic variables (e.g. economic background, single parent), not measured in this study, may have a more definitive impact on whether or not a student is successful in the reading course. The placement test merely reveals that the student has reading deficiencies, whereas, performance in the reading course includes the ability of the student to apply good study skill habits as well as the ability of the instructor to provide teaching methods that promote successful completion of the course.
Former studies have found that success in college could be attributed to the high school grade point average (Cohen, 1989); however, recent studies by Cliff Adelman, Senior Research Analyst at the U.S. Department of Education, (1999) suggest high schools need to provide more rigorous curricula for students, so that more students can successfully matriculate into a college program of study. The quality of the high school curriculum is a better predictor of college success than scores obtained on the computerized placement test in reading.

Dr. Edward Behrman at National University contends using content-general reading tests for placement into developmental or credit-level courses lacks content, criterion, and construct validity for placement purposes. Behrman (2006) recommends using content-specific reading tests. In other words, better placement testing may be the answer, rather than eliminating placement testing. The key may be to evaluate whether a student needs learning assistance in a particular credit-level course. Although there are many academic and nonacademic reasons why a student may not have been successful in the reading course, Behrman believes “the amount of variance in the course grade accounted for by scores on content-general reading tests… may be too low to warrant the continued use of these tests to predict success in a particular course (2006, p.42 ). Behrman and Street (2005) found a content-specific reading test for an introductory anatomy course was a significant predictor of course grades, but a content-general test was not. Behrman claims, “Perhaps one of the more perplexing issues in placement testing is how to achieve a more accurate prediction that takes into account the various academic (and perhaps nonacademic) variables that affect academic performance” (2006,
p. 42). Behrman concludes that refining the placement test so that it becomes a better predictor of success is a better choice than no placement test.

Developmental education’s major focus has not been in theoretical frameworks, but in classroom practices. The majority of developmental educators do not seek out theories to help their students, but turn to best practices in the field. Since many reading instructors do not steep themselves in theory-based instruction, teaching practices do not change dramatically, but evolve over time. The majority of reading instructors still use mastery learning for instruction, which in itself, creates a “personal” theory of teaching for individual instructors. Strategic learning which is supported by many researchers in the field of reading suggests that instructors need to begin to understand the complexity of the relationship between learning and studying so that students apply strategies and various processes to different types of content.

Implications for Practice

The results of this study lead to several implications for practice in Florida’s community colleges.

1. Continue to use placement test scores to place students in reading courses to promote success in future courses requiring reading even though the results of the study reveal the placement test scores cannot suggest successful completion of the reading course, at the very least, students are made aware that they do have deficiencies in reading which may be corrected by enrolling in the reading course.

2. To better evaluate the successful completion of the highest level college preparatory reading course in Florida community colleges, the
State needs a standard-setting committee to establish a cut-off score for the Florida Basic Skills Exit Test, in addition to standardizing test administrative practices.

3. Scrutinize program tracks of study for students who need developmental reading to determine if students should be counseled into specific majors.

4. College counselors and advisors should provide extensive career exploration in areas which may not always require a college degree, or even a certificate, to students who have made little progress, especially after three attempts (on the third attempt, students must pay full tuition), in successful completion of identified courses since the results of the study revealed approximately 40% of FTIC students fail the reading course the first time.

5. Developmental instructors need to explore innovative delivery methods coupled with student learning styles and learning communities in developmental reading courses given that national research suggested the reading course may be the main indicator of future success in college courses, and this current study revealed the placement test merely recognized deficiencies for remediation.

6. Results of the study suggest that other factors may contribute to a student successfully completing the reading course. One factor may be the various teaching styles of community college professors. Therefore, community colleges and the state educational agencies should provide developmental educators training workshops which provide and promote current research trends as well as instructional techniques, so developmental educators can address the needs and
challenges of the increased numbers of underprepared students who must meet the demand of our nation’s workforce at all levels. The National Center for Public Policy and Higher Education President Patrick Callan claims the United States will have a competitive disadvantage if public policy makers do not address the students who are unprepared for college, resulting in outsourcing high-level jobs of the future.

7. The study revealed that a 75 scaled score was the most frequent score on the reading portion of the CPT for Fall sessions 1997-2004, revealing no improvement in reading ability for FTIC students; therefore, Florida high school English courses should include regular testing of reading comprehension so that students’ reading skills improve prior to college entry.

8. Since the study revealed no improvement in high school students scores on the reading portion of the CPT from Fall sessions 1997-2004, the reading skills set on the CPT should be incorporated into a high school elective and become part of the “core” curriculum.

9. Since 1996, the CPT may be administered to evaluate Florida tenth graders; however, since it is voluntary, few students take the test. The test should be mandatory, to identify students who need remediation prior to graduation. Students who are identified as remedial should be required to take mandatory reading classes in the summer following tenth grade.

10. Since the study suggests other factors may contribute to whether or not a student will be successful in the highest level preparatory reading course, namely, class
instruction, the Florida Department of Education needs to provide ongoing professional workshops at the State level, bringing together both community college reading instructors and high school instructors.

11. Create a new placement test that is more aligned with exit test standards in the highest level college preparatory reading course, one that measures “Grade 13” college-level reading skills, rather than the ACCUPLACER test currently used.

Implications for Research

In response to the academically underprepared, the U. S. Education Department has recently established a national research center to address topics such as remediation and learning communities for unprepared students (Lederman, 2006). The National Research and Development Center on Postsecondary Education will be located at the Community College Research Center at Columbia University’s Teacher College. The focus is to improve access to higher education as well as improve the rates of earning degrees.

Based on the findings of this study and the limited research conducted in the field of reading placement tests, and the relationships to success in the reading courses, future research in Florida should examine the relationship between successfully completing the reading course and the subsequent success in other courses requiring reading. For example, research should be conducted to determine if there is a relationship between passing the reading course and successful completion of courses which require college reading skills, included, but not limited to, composition, humanities, sociology or government. The ultimate success of the student is not the score on the placement test, but
whether or not successful completion of the reading course predicts future success in college level courses.

The results of this study suggest several other areas for future research:

1. Develop credible course-specific placement tests to determine if, as current research suggests, placement testing should transcend placement in just developmental reading courses, but extend to placement in specific college-level classes.

2. Verify Cliff Adelman’s recommendation that high schools should provide a rigorous curriculum, by examining high school transcripts for courses which may render a predictive quality, and whether or not there is a relationship to passing the CPT and/or passing the reading course, and more importantly earning a degree.

3. A recent study revealed that students should not work more than 15 hours a week if they are to be successful in college studies. Conduct studies at the community college level to see if a certain number of hours of employment should restrict the number of hours of course work.

4. Examine the relationship of placement scores in the other two developmental disciplines of mathematics and English, and subsequent success in the highest level preparatory courses in mathematics and English.

5. Develop a survey which would determine the characteristics of students who are successful in the reading course, specifically, study habits or others nonacademic factors which contribute to a student’s success.
6. Current research suggests students should form learning communities for support in the learning process. Colleges should implement learning communities and track students to see if this provides support in the first year and subsequently a positive impact in developmental studies and/or future studies. Students comfortable in learning communities may prove to be an integral part of any workforce in the most dynamic business environments.

7. A longitudinal study including all Florida community colleges should be conducted to determine the best practices which contribute to successfully completing the highest level college preparatory reading course.

8. A follow-up study should be conducted to see if the students whose scores are clustered around 83 complete a program of study.

9. A future study should look at results by age and/or age and program tracks because A.A.S. degree students are often older. The current study revealed that students in an A.A.S. program track averaged a higher grade point average than students in the A.A. or A.S. program tracks, the session following successful completion of the highest level college preparatory reading course.

Students who are underprepared for college-level courses due to reading deficiencies would be better served, if at the very least, high schools returned to teaching reading skills in their core curriculum. Content area courses, English courses and reading electives having a prescribed set of reading skills would be the first step in ameliorating the influx of students requiring reading courses when they enter college. Continuing reading programs beyond middle school for all students should be implemented because
school administrators should not be content that students are passing a reading test on the tenth grade reading level, but should be promoting reading achievement which assures all students are indeed ready for college.
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Appendices
Appendix A

Comparison of SAS Probability of Passing Rates and Descriptive Statistics (Actual)

Passing Rates in Highest Level College Preparatory Reading Course

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Note: SAS LOGISTIC Database fall sessions 1997-2004 FTIC Florida Community College Students Computerized Placement Test.
About the Author

Although originally from Pittsburgh, Pennsylvania, Laura Smith graduated from Naples High School in Naples, Florida. Laura Smith received a bachelor’s degree in Early Childhood/Elementary Education from the University of South Florida in 1972, and a master’s degree of science in Reading and Language Arts from Duquesne University in 1977. She began her teaching career while in the master’s program. She was the first full-time developmental reading instructor at the then St. Petersburg Junior College in 1979 and established one of the first learning support centers in Florida at the Tarpon Campus.

While at St. Petersburg College, Professor Laura Smith has taught developmental courses in mathematics, writing and reading. She entered the Ed.D program at the University of South Florida in 2001. Mrs. Smith has authored a reading test preparation booklet for the Florida CLAST, as well as a phonics guide for parents. Laura Smith has been a member of the Florida Developmental Education Association since the second year of its inception.