

ANTECEDENTS OF SUCCESS IN THE ASSOCIATE DEGREE
AND CERTIFICATION PROGRAMS AT GLOUCESTER COUNTY
NEW JERSEY COMMUNITY COLLEGE

by

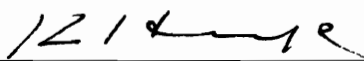
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Dissertation submitted to the Graduate Faculty of the
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in partial fulfillment of the requirements for the degree of
DOCTOR OF EDUCATION

in

Higher Education Administration

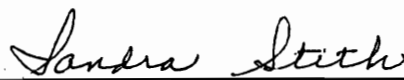
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Blacksburg, Virginia

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Educational Administration

(ABSTRACT)

Public community colleges enroll a high percentage of high risk students. The majority of these students drop out of college.

At Gloucester County College, New Jersey of 718 entering students in the Fall of 1988 only 196 or 27% completed requirements for a certificate or two year associate degree after six semesters. In an effort to increase the success of entering students, Gloucester County College gave each student a state mandated placement examination in Reading Comprehension, English Composition, and Mathematics Computation and placed those students who failed the exams in pre-collegiate developmental courses hoping thereby to prepare them for regular collegiate level work.

In this study, the possible effects of 19 variables on the students' academic progress toward program completion were examined. These included: personal and education

attributes of the students, characteristics of the high schools from which they were graduated, their scores on entry level tests of basic skills, and their performance in remedial, developmental, and regular collegiate level classes.

In general, high risk students were more likely to drop out of Gloucester County College regardless of their initial placement in regular, developmental, or remedial courses. On basis of this study, it remains unclear whether or not remedial courses promoted program completion. It is clear, however, that students who were assigned to pre-collegiate level courses dropped out sooner than other students, earned fewer credits, and with lower QCAs when doing so, and rarely persisted through graduation. Yet, on basis of entry level test scores alone, as many as 20% of those who failed one or more tests were graduated and an additional 16% were still persisting after six semesters.

Dedication

This dissertation is dedicated with love to my husband, Richard Searles Martin, Sr. Recognizing that my educational dream was to earn a doctorate, Dick has supported me in every way possible: emotionally, spiritually and financially.

Dick has never complained during my long absences in residency and subsequent summers at great financial cost for tuition, books and lodging. He has sat with me endless hours at the computer reading me hundreds of variables so I could enter data faster, then spent endless other hours with me checking and rechecking the data to make it as pure as humanly possible. He has many times done my share of the household chores without complaint.

He has fathered and nurtured our two very precious children to become the marvelous, productive and happy human beings they have become.

He has borne all things, believed all things and hoped all things and the commitment he made to me those many years ago has never once wavered through our journey through a life filled with ups and downs, twists and turns, but altogether enriched.

No one could have ever done more to help and support

another human being. I am forever grateful for his patience and love.

"To love another person is to see the face of God."

Acknowledgements

I began my lifelong love of education the moment my Mother lifted me high in her arms to peek in the window of my kindergarten room and said, "Oh, Geraldine, honey, you are going to LOVE school. Your room even has a **sandbox!** Virginia Tech completes my fifty eight year formal educational circle.

When one begins a doctoral program they quickly realize that it is not done alone. I have been most fortunate to have been supported and helped by many people. It is important to me to publicly acknowledge them.

Gloucester County College

With gratitude I remember the following people from a college I love.

Carl Chance and the late Vern Houston were in the first Glassboro State College/Virginia Tech Cycle "bus group" and they encouraged me to become a member of the second. Once the commitment was made, the college community dedicated itself to helping me accomplish my goal.

President Dr. Richard Jones, and then Vice President of Faculty, Dr. Bob Mossman, opened wide doors to aid me in my research and then continually, without being asked, sent me updated information they thought might be useful to my study. Even members of the College Board of Trustees expressed interest in my dissertation when they saw me.

Catherine Donovan, secretary to the college president, told me that it was the moment I had worked so hard for and I **must** go to Virginia for residency. Evelyn Webb, Vice President of Student Services granted me endless hours to research the files, Jane Crocker, Library Director, extended our vast library services through Linda DeFelice, Pat Hirsekorn, and Anna Kehnast. These three ladies never tired of helping me any way they possibly could. Pat Gross in the Computer Informational Services provided me with many computer printouts of information vital to my research. Dr. Sandra Stabingas, Chair of Allied Health helped me in so many ways, sometimes just by her empathy in dealing with the final throes of the dissertation. My officemates, Carol Murtha, R.N., and Berminna Solem have continuously encouraged me and Berminna graciously traded classes when it was imperative to do so. Eoin Kinnarney did the beautiful graphics for me, and Dave Coates and Julia Roel the overheads. The college nurse, Cora Post, recently retired still calls to encourage me. Rosie Hudson the best "xeroxer" and Dennis Lloyd who helped so much with the computer. My students, who each year bring me such joy and make me so pleased to be a teacher.

My final thanks at Gloucester County College are reserved for Mr. Vanel Perry, College Vice President of Faculty and Instruction. In some capacity Van Perry has

been my supervisor for most of my long tenure at Gloucester County College. He has mentored me faithfully, remained committed to my very long-term doctoral goal, and encouraged me constantly. There could not be a finer human being in any organization than Mr. Vanel Perry. He genuinely cares!

Virginia Tech

In the **beginning** of my tenure at Virginia Tech there were Dan Vogler and Charles Atwell, two very fine teachers.

In the **middle** there were four faculty members who must receive special recognition. The first is Dr. Ron McKeen my advisor and member of my dissertation committee. Dr. McKeen, during a particularly difficult moment at my prelims when I was hard pressed for an answer and it simply would not surface, made a little circle with his hands and that simple gesture cued me in. I will never forget the moment. Second is Dr. Gabriella Belli, the petite, feisty lady who taught us statistics, almost my academic nadir. I shall remember always three things about Dr. Belli. The first is her obvious joy the moment she told me I had passed the statistics preliminary. I still consider it living evidence that miracles still happen. Second is when the midnight hour was approaching to hand in dissertations to the graduate school to be able to graduate, and there were still so many changes to be made despite working days and nights for weeks. This gracious lady stepped in and helped to pull the

whole dissertation together. Finally, I will never forget her sense of humor, her style of teaching and her caring.

Third is Dr. Sandra Stith who serves as cognate person on my dissertation committee, and taught me so very much about Family Therapy. The group of students going through the program, such as Gary Bischof, shared so many wonderful times with me. We will always care about each other. Finally, Dr. Loyd Andrew, another committee member, who told us he would never give up cigarettes because he enjoyed smoking too much, and then died of lung cancer.

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Beginning, and middle, but there would not have been an **ending** without Dr. Karl Hereford, who has chaired my disseration. Astin tells us that most teachers are committed to the best and brightest students and essentially teachers at Virginia Tech are no different. But one man, Dr. Hereford, who chairs the research department at Virginia Tech, saw my dream that seemed so impossible and determined to help me. He is a man of courage, integrity, and

brilliance. He has worked with me through rain, knee-deep snow, and summer days with overwhelming heat, and no air conditioning. We have worked in his little third floor office with a painter precariously standing outside his third floor office window, pigeons cooing on his window ledge, a custodian mopping floors with a solvent acrid enough to cause allergic reactions, workers pumping asbestos out of the basement, and person after person entering his office for help or direction of every sort. He has asked nothing but the best work I could produce, and then helped me rework that again and again until it was better. He will not accept any kind of gift, graciously saying that the State of Virginia pays him to do his work. No one could ever pay him enough for all of the commitment and dedication he has devoted to Virginia Tech and to me! He has been my teacher, mentor, and friend. I am forever grateful to him.

Friends

There have been others during my sojourn at Virginia Tech who have played major roles in this process. Dee Weeks, Carmen Wisdom, Pat Bryant and Bernie Curtis were ALWAYS there. The "kids" who so generously shared "their" lab with me: John Williams, Abbot Packard, Melinda Cumbow, Candace Adams, Jill List, Heather Koball, Catherine Rogers, Chris Mead and Janice McBee who also patiently worked with me.

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Tom and Cindy Moribondo regularly prayed to St. Jude

for me.

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My final thanks are to my family. God sent me to the right birth family where Florence and Leonard Savidge tenaciously nurtured their three children. Our parents taught their two daughters and son the importance of family and sticking together. We always have. During this doctoral pursuit our Mother died, but my 84 year old Dad, his new wife Clara, and my sister, Lee Savich, and brother, Ted Savidge have continued to support me in endless ways. My family, especially my brother, has moved me and my things more times than any of us will want to remember.

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John Tetzner.

In this doctoral process, and in my life, our daughter has pushed, pulled, tutored me endlessly on the computer, shared my laughter and tears and has ALWAYS been there for me. She is not only my daughter, but also my dearest friend.

My husband, whom I have also mentioned in the dedication can not be thanked enough for his patient endurance and love. When I was failing a statistics course at one point, a "pick-me-up bouquet" arrived in Northern Virginia with the message, "Pass or fail we still love you." Even the dogs names were signed on the card. I not only passed the exam but never came close to failing again. This is the faith and love my family has unselfishly given me. And now our family circle enlarges once again as we eagerly await the birth of the first member of the next generation of our little family, our precious grandchild, already thoughtful to schedule arrival three weeks AFTER graduation. God has truly blessed our lives!

My final thought must be for my Mother who gave unselfishly of herself to everyone, loved us unconditionally, motivated us in endless ways, taught us how to have J.O.Y. in life and told us that we could be whatever we chose to be: life goes to people who persist, life is not a sprint but a marathon, and it doesn't matter where you

start it's how you finish that counts.

When I was a young teenager my parents, at a tremendous sacrifice to the rest of the family, sent me for two years to an all-girls' boarding and day school in another state. To assuage my homesickness, Mother would write frequently and send me poems and verses. One of these began:

"Ride, ride, ride to the sun,
Let nothing deter
'til your goal it be won."

Well, Mother dear, wherever you may be, FOR SURE YOU ARE, I took that ride with Dr. Karl Hereford at Virginia Tech--AND IT WAS QUITE A TRIP!!!

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Chapter 1

Public community colleges admit for full time study and seek to educate "high risk" students as part of their regular mission. Accepting high risk students also places the accepting institution at risk because of high failure rates. Only one-fourth to one-third of all full time entering freshmen to these institutions generally are reported to complete the first two years of college.

The rate of completion among high risk students is substantially less than that of regular students for two reasons: (1) high risk students include those whose pre-collegiate preparation is substantively inadequate; typically, they must complete a year of non-credit, remedial studies (e.g. reading, English composition, and elementary mathematics) before undertaking regular college level courses, therefore, (2) the number of units required of them to complete a two-year degree program is materially increased thereby making it less likely that they will be graduated even were they to progress satisfactorily.

Gloucester County College, New Jersey (GCC), where the author occupies a professorship, is typical of community college experience in this regard. The college accepts any bona fide high school graduate or holder of a General Education Diploma (GED). Because of a marked unevenness in

the preparation of high school graduates and a lack of reliable, standardized information on their high school transcripts, Gloucester County College--along with all other New Jersey public colleges--is mandated by the New Jersey State Department of Higher Education to administer a battery of basic skills tests to all incoming full time students and, on the basis of those test scores, to place the students in remedial (elementary), developmental (pre-collegiate), or regular collegiate level classes. By so doing, it is anticipated that those who score below a given cutting score on the entry level examinations will be given an opportunity to bring their performance up to collegiate standards before undertaking regular collegiate level studies.

Despite these efforts to overcome academic deficiencies in the pre-collegiate preparation of certain of its beginning full time students, Gloucester County, like other community colleges, loses the majority of its full time students prior to completion of a one-and-one-half year certificate or two year associate degree program. Whereas 40% of full time students admitted to regular college status in Fall 1988 were graduated within four to six semesters, only 7.5% of those students who were admitted full time to remedial and developmental courses were graduated during the same time period. Fifty percent of the regular students and

75% of the remedial and developmental students dropped out during this period, with only 19% and 12% respectively still pursuing their community college studies after six semesters.

With these substantial dropout figures, community colleges such as Gloucester County College increasingly are placed at risk in terms of continued public support, particularly during periods of economic downturn. Already the United States Congress is considering restrictions on student loans to high risk students; State governments under economic pressure may be expected to entertain similar restrictions. For example, the State of New Jersey, originally committed to funding one half of community college budgets, has never funded at that level and has consistently reduced financial support to its current level of one fourth the community college budget. At the least, the colleges themselves will be expected to identify the causes underlying their record of student progress and to document their arguments for continued public support.

Fortunately, there is a potential wealth of data generally available at these colleges, including Gloucester County College, which if edited and organized could be used to track student progress, particularly of high risk students, as one effort to determine some of the antecedents of success or failure of the students in collegiate level

programs. Such was the intent of this study of one cohort of students entering Gloucester County College, New Jersey.

Purpose of the Study

The purposes to be served by this study were three-fold, as follows:

1. To identify (and describe the distributions of) those variables available at Gloucester County College and any additional variables reported in the literature to predict or account for success in two year college programs.

2. To determine which of these variables, individually or in combination, best predict or account for differences in the performance among full time students in their entry level basic skills tests and in their subsequent success in completing a two year college degree program or one-and-one-half-year certification program at Gloucester County College.

3. In addition to these research objectives, Gloucester County College and the author intended to refine a data base that might permit responsible faculty and staff there to monitor the effectiveness and efficiency both of their entry level basic skills testing program in the initial placement of entering freshmen, and of the subsequent success of their remedial and developmental instructional programs in moving regular and high risk

students through a multiple year certificate or degree program to completion.

Using these and related data, subsequent research might surface those specific aspects of the College's programs and/or educative processes most likely to promote success among students, particularly those who enter at high risk. Though the issues raised and statements made throughout this study in many instances are relevant to New Jersey community colleges in general, the study is focused on Gloucester County College which provided the data and support needed for the study.

Research Strategy

A three-pronged strategy was adopted in order to address these purposes. These were:

1. Using available data, describe the incoming full time students of a recent year (1988) and follow their progress over six semesters to completion of an associate of arts or science degree or a certificate. (Associate degrees typically require four semesters and a certificate three semesters of full time study to complete. Additional time is needed by high risk students because of their need to complete certain pre-collegiate courses before undertaking regular courses leading to a degree.)

2. Using appropriate statistical analyses and within

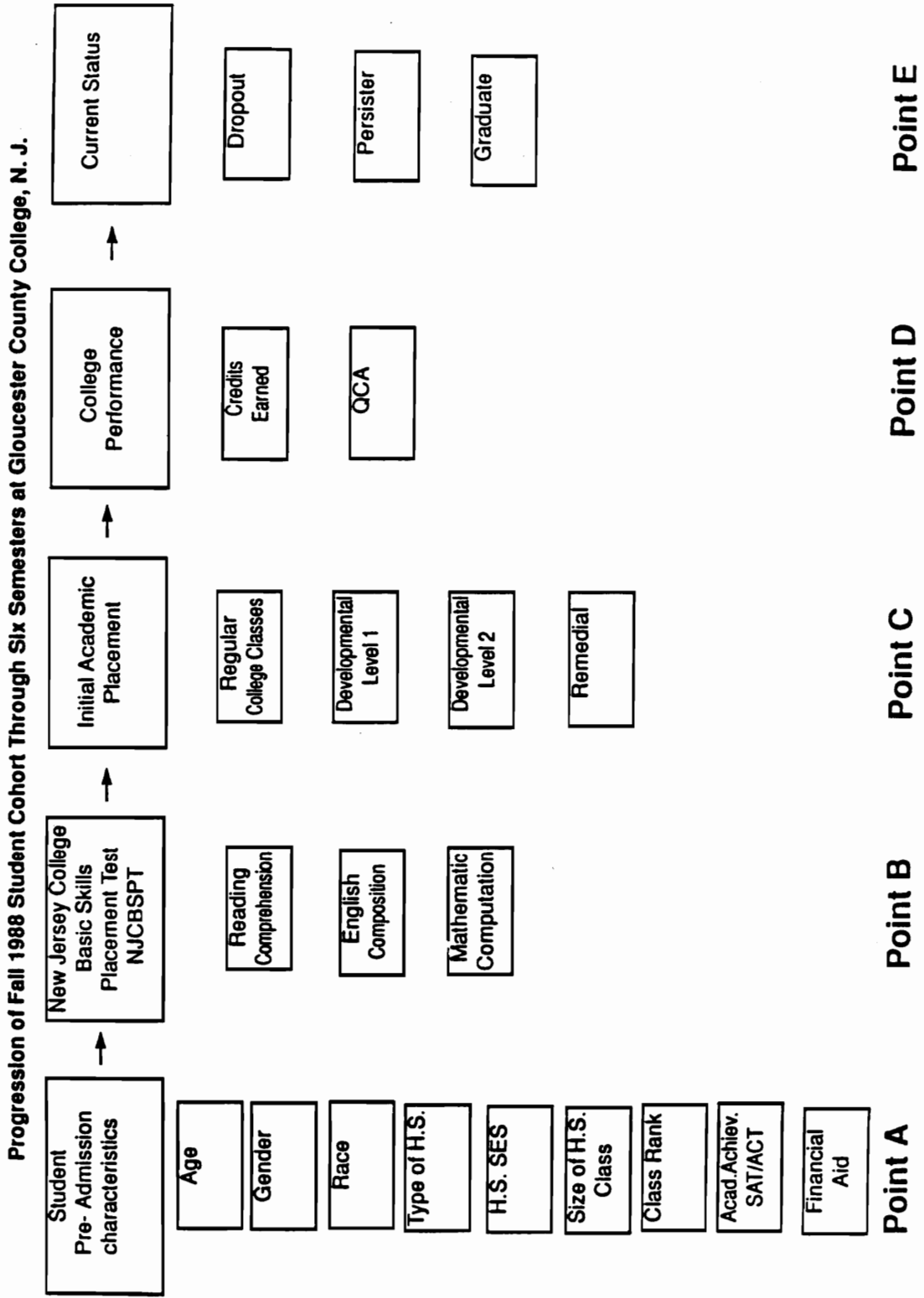
the constraints of available data, attempt to describe and then account for the differences in student performance at each key point in their progression through the multiple year programs.

3. Finally, to comment on the adequacy of available data for continuing this or related institutional research; suggest possible additions, deletions, or improvements that might be made by Gloucester County College in its data base and monitoring reports.

Typical Pathway Through Gloucester County College Programs

If one were to trace the class beginning in Fall 1988 through six semesters, the pathway might be summarized as in Figure 1, where students are admitted on basis of their personal attributes and high school performance as depicted at point A; on the basis of their entry level test scores in Reading Comprehension, English Composition, and Mathematics Computation, students are assigned to one of four academic levels for instruction (point B). On the basis of their academic performance (point C), students attain a final status during or at the conclusion of six semesters, either as drop-outs, graduates, or students still persisting but short of completing degree requirements (point D).

Figure 1



Research Questions

In implementing the research strategy, the study was organized to address four specific questions. They were:

#1. Which personal attributes and high school performance variables, individually or in combination, best accounted for the differences in scores on the entry level examinations?

Addressed in this question are the personal attributes of the 718 full time students entering Gloucester County College in the Fall of 1988; the types of high schools from which they were graduated; how well they performed in high school; which students accepted some form of financial aid on admission to Gloucester County College.

#2. How consistent were the initial academic placements with students' scores on entry level examinations?

#3. Which variables (personal attributes, high school performance, entry level test scores, and academic placement) individually and in combination, best predicted or accounted for differences in their subsequent college academic performance over six semesters (i.e. degree credits earned; grade point average)?

#4. Which variables (personal attributes, high school performance, entry level test scores, academic assignment to developmental, remedial, or college level courses)

individually or in combination best predicted or accounted for the differences in their persistence or level of academic attainment after six semesters? Specifically, what were the apparent effects, if any, of their initial academic assignment to full time study in remedial and developmental courses on the status of "high risk" students' academic progress by Spring 1991?

In pursuing the four questions indicated above, particular attention was given to the adequacy of the several data sources for the specific variables selected for study. What additional variables were available but not in a form or condition suitable for analysis? What potentially useful variables from the literature might be added to those currently available to New Jersey community colleges for use in their data bases?

Variables Employed in the Study

As demonstrated later in Chapter 2, 19 variables grouped into six categories were selected for study from the available student personnel, admissions, and business records at Gloucester County College. These were:

1. Personal Attributes of Incoming Students (4)
 - a. Gender
 - b. Race
 - c. Age

- d. Need for financial aid to attend community college full time.
2. Characteristics of the Students' High Schools (3)
 - a. Type of high school attended (public, private)
 - b. Socioeconomic status of high school population
 - c. Size of high school class.
3. Students' Performance While in High School (3)
 - a. Credits earned by type of high school program
 - b. Grade point average across high school subjects
 - c. Rank in graduating class.
4. Entry Level Test Scores (4)
 - a. Scores on ACT or SAT tests taken as high school student or prior to admission to college
 - b. Scores on New Jersey standardized entry tests:
 1. Reading Comprehension
 2. English Composition (A composite score)
 - a. Sentence Sense
 - b. Essay
 3. Mathematics Computation.
5. Post-Test Academic Placement at Gloucester County College (4)

- a. Full time remedial courses (elementary level)
 - b. Full time developmental courses (pre-collegiate level)
 - c. Part-time developmental course(s)
 - d. Full time regular collegiate level courses.
6. Academic Performance at Gloucester County College
(4)
- a. Number of college credit hours attempted
 - b. Number of college credit hours earned
 - c. Cumulative quality point average across earned credit hours
 - d. Final attainment after six semesters:
 1. Drop out
 2. Still persisting but short of completing degree requirements
 3. Graduated

Delimitations

The population of interest selected for study was incoming students in New Jersey public community colleges. However, data were confined to the 718 students who were entered into full time study at Gloucester County College, New Jersey, in Summer or Fall 1988 and for whom official records of academic progress were available through and

including Spring 1991. Of the 718 entering students, 25 were transferred from another institution and were not required to complete the entry level examinations at Gloucester County College. Presumably, they had taken these examinations at their last institution if located in New Jersey. Accordingly, test data were confined to the 693 students who were entering Gloucester County College as freshmen and who completed the entry level examinations at Gloucester County College. Finally, the study was limited by the official documents available on each student from cooperating high schools and the registrar and business and admissions offices of Gloucester County College.

Definition of Terms

Certain terms with restricted meanings are used throughout the study. Others are defined operationally in Chapter Three as needed. The general terms are:

- a. Basic Skills Test (New Jersey College Basic Skills Placement Test): A test to determine whether an individual has developed the practical working skills of verbal and mathematical literacy needed to take advantage of the learning opportunities that colleges provide (N.J. Basic Skills Council Report to Higher Education, 1989, p. 1).
- b. Full time student: Student taking 12 or more

credit hours in one semester. Part time student: Student taking less than 12 credit hours in one semester (Gloucester County College Catalog, 1991, p. 8).

- c. Traditional (non-traditional) student: For the purposes of this study, a student entering college within four years of high school graduation age (18 years), is defined as traditional. Non-traditional student: For the purposes of this study, a student entering college more than five years after high school graduation (age 23 years or older), or receiving a General Education Diploma (GED); usually having worked in the labor force and/or having married and had a family prior to returning to college (Demaree, 1986, p. 43).
- d. Remedial level program: Includes both "remedial" and "developmental" programs designed to help skills-deficient students improve their basic skills in the areas of reading, writing, computation and elementary algebra (Report of N.J. Basic Skills Council Department of Higher Education on N.J. Effectiveness of Remedial Programs in Public Colleges and Universities, Fall 1987-Spring 1989, p. 171).
- e. Developmental level courses: A structured program

of studies for those students whose New Jersey College Basic Skills Placement Test reveals a basic skills deficiency. The program is designed to develop and enhance a student's academic abilities in the areas of reading, writing, and mathematics before undertaking regular, collegiate level courses (GCC Catalog, 1991, p. 18).

- f. Regular or collegiate level courses: All persons successfully completing college identified placement tests in English, Reading and Mathematics and not requiring remediation receive appropriate program acceptances to a college program or course of study (G.C.C. Institutional Report on Remedial Effectiveness, 1987-1989, p. 3).
- g. Graduate: Student successful in completing two year degree or 18 month certificate degree program, student completes 60-66 credit hours of study and graduates with an Associate of Arts, Associate of Science, or Associate of Applied Science degree, or student completes 30-36 credit hours and receives a certificate in program of study.
- h. Drop Out: Student failure in completing two year degree or 18 month certificate degree program:

Student drops out and/or fails in basic skills program or program of study (G.C.C. Catalog, 1992, p. 41).

- i. General Education Diploma (GED): High School Equivalency Diploma (G.C.C. Catalog, 1992, p. 7).

Chapter Outline

In Chapter One, the purposes of the study were laid out and four specific research questions delineated, around which the study was organized. Twenty-one variables, grouped into six categories, all of which were available at Gloucester County College, were used to address the research questions.

Chapter Two: Review of the Literature. Results of the principal studies since 1965 that address questions of retention and dropouts in two and four year colleges are summarized, their research methods and limitations noted, and potentially useful variables identified for this study at Gloucester County College, New Jersey.

Chapter Three: Design of Research. In this chapter, the principal elements of a research design for an exploratory, largely descriptive study of the four principal research questions are delineated, including the plan employed to edit and organize data for analysis, and the analysis plan used to address the several research

questions.

Chapter Four: Results of the Study. Data are arrayed in this chapter to describe the members of the 1988 cohort and their passage through the Gloucester County College programs through Spring 1991. Data also are used to identify student personal and educational attributes, student placement into college programs based on NJCBSPT scores and college performance leading to graduation, persistence or dropping out.

Chapter Five: Summary, Conclusions, Future Considerations, and Recommendations. In the final chapter, results cited in Chapter Four are summarized and conclusions offered based upon the responses to each and all of the original research questions. Suggestions are offered for improving the data base maintained by the college and for its future use in monitoring student progress and in supporting additional institutional research.

Chapter 2

Review of the Literature

Gloucester County College, a small, progressive community college, founded in 1967, is located on 270 acres of land in southwestern Gloucester County, New Jersey, parallel to Philadelphia, Pennsylvania. Along with 18 other community colleges in the state of New Jersey, Gloucester County College shares several similar missions including student transfer to four year colleges and universities, community service, and programs for lifelong learning and vocational education. The primary mission, however, is to provide an "open door" guaranteeing that anyone desiring a postsecondary education would not be denied the opportunity to enter. As with all nonselective programs, a significant number of entering students are "high risk" and community colleges have come to accept a high drop out rate as a natural consequence of admitting high risk students. Losak and Morris (1985) feel such attrition is testimony to the responsibility of the community college to provide educational opportunities to disadvantaged and underprepared students while maintaining acceptable academic standards (p. 8).

However, the New Jersey State Department of Higher Education, in an attempt to limit the social effects of the

colleges' "revolving door," established in 1977 a Basic Skills Council and, under its leadership, the New Jersey Basic Skills Assessment Program. The program had two purposes, namely: to provide a comprehensive testing program to aid colleges in placing students in appropriate courses during their freshman year of college and second, to report test results to the Board of Higher Education in order that it might monitor the status of preparedness of entering freshmen students in reading, writing, computation, and elementary algebra (Report to the New Jersey Board of Higher Education, 1989, p. 16). New Jersey currently is "unique" (1) in requiring basic skills testing of all full time students after admission but prior to course registration, and (2) in the mandatory placement of low scoring students in compensatory programs of study (Vaden, 1989, p. 27).

Despite these statewide efforts over a period of 11 years, no significant gains in average test scores were found among entering freshmen in New Jersey's 19 public community colleges (Report to Board, 1989, p. iii). Moreover, student persistence and dropouts remain essentially unchanged over this time period.

Available Data at Gloucester County College

Data available at Gloucester County College can be grouped into seven categories. These are:

- a. Personal Attributes of Students.
- b. Characteristics of High Schools Attended.
- c. Performance While In High School.
- d. Scores on Entry Level Tests and the New Jersey College Basic Skills Placement Test.
- e. Placement in Gloucester County College Curricula: remedial, developmental, regular.
- f. Academic Performance at Gloucester County College.
- g. Academic Status After Six Semesters: dropout, retained in good standing, graduated.

Questions Addressed in Chapter 2

a. Which of these readily available variables have been demonstrated in other studies to be related to success or persistence in pursuit of certificate or associate degrees in two year colleges?

b. What other factors, if any, have been shown in other studies to be related to success or persistence in pursuit of certificate or associate degrees in two year colleges?

Background

Numerous studies have been reported to identify factors underlying college completion, dropouts, and retention. Most studies dealt with students at 4-year colleges. Chief among these were those initiated or inspired by Spady (1978), Tinto (1975), Astin (1976) and Pascarella (1983). Using regression analysis to predict college dropouts or "persistence," these researchers have contributed to a thesis that student "academic and social integration" into the college are primary indicators of college persistence.

Other important studies included 2-year community colleges as well as 4-year colleges. Studies noted by Astin (1973), Chickering (1974) and George (1971) in Pascarella, Duby, and Iverson (1983), suggest evidence "that students attending a commuter college (or who commute to a residential school) are a different population than students residing on campus. Such initial differences in student selectivity may be a significant determinant of apparent differences in the patterns of variables directly influencing persistence across commuter and residential institutions" (p. 98). Residential 4-year college studies are probably irrelevant as far as the study of 2-year college populations are concerned. However, studies dealing with commuter colleges (as opposed to residential) colleges, whether two year or four year institutions, may provide

useful insights into drop out situations in two year colleges.

Personal Attributes of Students

Results of studies of effects of personal attributes of students and subsequent college performance are mixed. The Tinto model, which "emphasizes the importance of goal and institutional commitment, and social and academic integration into the college as predictors of decisions to persist or drop out of a particular college," has been used by many researchers (Anderson, 1987, p. 6). Anderson concluded that "student pre-college background is relatively unimportant, and relevant only as it shapes psychological orientations to specific institutional environments" (p. 7). She later summarized from her study that there was significance in "gender, with males higher, and high school achievement" (p. 18). Most researchers found that older women (those returning to school after working or rearing families), and upper middle class men were more persistent in their pursuit of educational goals, while women got higher grade point averages and worked to the level of their potential (Astin, 1971; Lavin 1965; Pascarella, 1982; Pascarella, Duby, & Iverson, 1983). Other researchers (Chapman & Pascarella, 1983; Rodwick & Grady, 1976; Terenzini & Wright, 1987) found no significant

relationship with persistence in the background characteristics of age and socioeconomic status, although Terenzini & Wright concluded that females performed better than males.

Lavin (1965) disagreed with most of the research pertaining to the influence of socioeconomic status on college retention. He reported that students of higher socioeconomic status perform at higher levels than students of lower socioeconomic status (p. 43) adding that persons of different socioeconomic status face different kinds of life situations and in adapting to them develop different sets of values and life styles (p. 123). He concluded that socioeconomic status symbolizes a variety of values, attitudes, and motivations related to academic performance (p. 124).

Most researchers agreed with Astin (1971) who noted that race had no "direct effect on students' academic performance. Black students perform just as well as white students of comparable ability in the traditional freshman curricula" (p. 14).

Anderson (1987) states, "In public commuter colleges, gender, race, and social class have no effects. The system is an entirely meritocratic one in which students' previous achievement and early goal commitment are translated into later college grades and goal commitment which increase

persistence" (p. 20). However, later Anderson concludes that "Students who enter the community college system need a variety of background advantages. Those who enter being male, higher SES, with good high school records, parental encouragement of their goals, and confidence in their own academic skills are able to translate these into continuing goal commitment and persistence" (p.20). She also states that students should be "warned against employment, which lowers their involvement in school and encourages them to drop out" (p. 20). Kohen, Nestel and Karmas (1978) also report decreased college persistence among employed students (p. 238).

Of the various personal attributes examined in the literature, three seem to be germane to the study of academic success at Gloucester County College. These are: gender, socioeconomic (SES) status, and outside employment. Of these, gender was available at Gloucester County College. A direct measure of SES was not. However, two indirect measures were available, namely: the SES of the population in the area of the high school attended by incoming college students, and a report of students' acceptance of financial aid.

In most instances, however, differences in students' personal attributes accounted for very small albeit statistically significant proportions of the difference in

their decisions to persist or withdraw.

Characteristics of High Schools Attended

Several researchers included characteristics of high schools attended by community college students in their studies of college persistence. Some researchers hypothesized that students who had attended a large public or a private high school from favored economic areas would be better prepared and academically motivated, hence tend to persist in their studies once in college. Chief among these were Falsey and Heyns (1984) who reported that graduates of private schools were more likely to attend a highly selective four year college than a two year commuter college making within-college comparisons difficult to achieve; and Coleman, Hoffer, and Kilgore who reported that 24 percent of public high school students dropped out in comparison to a drop-out rate of 12 percent for Catholic high school students and 13 percent for other private school students (in Banks and Banks, 1989, p. 79). Persell and Cookson (1985) and Lewis and Wanner (1979) reported that "Graduation from a private rather than a public high school is positively related to attending a four-year (rather than a two-year) college, attending a highly selective college, and earning higher income in adult life" (Banks & Banks, 1989, p. 79).

The Chancellor of New Jersey Higher Education,

Goldberg, (1991) reported that private school graduates have lower percentages of students in the "Lack Proficiency" category than public school graduates in verbal skills; however, public school graduates were less likely to fall into the remedial category than private school graduates in both computation and elementary algebra (p. 6). Goldberg also reported that students entering community colleges from low socioeconomic areas (defined as poverty areas under QEA, the Quality Education Act in New Jersey) tended to fall into the "Lack Proficiency" category of the NJCBSPT more frequently than students who were not in the QEA identified areas of poverty (p. 6).

Hoyt (1959) found graduates of smaller high schools tended to receive lower grades in college while Altman (1959) found size of high school to be unrelated to performance in college (in Lavin, 1965, p. 133).

In summary, type of high school seemed related to college persistence. Among variables available and germane to this study were: size of high school, type of control (public or private), and socioeconomic status of the population in the high school attendance area.

Community College Students' Academic Performance in High School

In most studies researchers found that high school grade point average and/or class rank were primary predictors of success in college (Anderson, 1987; Astin, 1971; Greenberg, 1978; Howell & Friese, 1979; Pascarella & Chapman, 1983).

Swenson (1957) found that "students in the upper 2/5 of their graduating class in high school received significantly higher grades at the end of their first semester in college than students who graduated in the lower 3/5 of their high school class even though these two groups did not differ on a standard aptitude test" (in Lavin, 1965, p. 52).

Other researchers addressed their studies to types of high school courses with varying results. Kohen, Nestel, and Karmas (1978) found that the high school curriculum did not affect success in college beyond the freshman year, while McTarnaghan (1987) reported that high school core courses were "vital predictors" of college success (p. 77). Goldberg (1991) noted there were an increasing number of students entering the New Jersey community college system from a "general" rather than college preparatory program. He reported "Of the approximately 31,000 students tested at the county colleges, for example, only 46% had graduated from "academic" high school programs. Students from "general"

and "career oriented" programs are making their way to college in significant numbers (over 16,000 this fall). These graduates are two to three times more likely to be placed in remedial courses than graduates from "academic" or "college prep" programs. Whether in special needs or non-special needs districts, students need to understand early in their school career that the basic academic skills for a productive citizen, a high-tech employee or a college freshman are similar and require serious work " (1991, p. 2). He further urged that "We...work more closely and more comprehensively with the [high] schools to see that the skills for college work are defined and delivered not only to 'college-prep' students but also to the increasing proportions of 'general-program' students who decide to enroll in our county colleges" (p. 7).

While many of the researchers felt that high school grade point average (in some instances self-reported by students) was the single most important predictor of college success, there were reports to the contrary. Morante (1987) a psychologist and leading member of the New Jersey College Basic Skills Council (initiators of the New Jersey College Basic Skills Placement Test), offered two reasons why high school grades, the number and type of high school courses, high school grade point average, and class rank should not be used independently but in combination with the NJCBSPT

score:

1. The high school performance of many students may not accurately measure their current proficiency level and
2. "High school transcripts can be difficult to interpret and are sometimes even contradictory" (p. 57).

A study by Siegel and Anderson (1991) reported that "colleges as a group do not agree about how [high school] GPA and rank-in-class should be calculated" (p. 104). Most preferred to use a weighted rank-in-class over weighted GPA (the preference based on the assumption that "the GPA can be computed or recomputed according to institutional preference, given the information available on the transcript, whereas rank-in-class must stand as presented") (p. 96). They also reported unpredictable shifts in student GPA. The greatest impact of GPA and class rank occurs in academic subjects particularly math. The "consistent" student, therefore, is frequently penalized since students make course choices to protect their GPA and class rank (p. 101, 102).

While student attendance and lateness in high school were not addressed in most of the major research studies, Creamer (1989) indicated in his study of Consequence of Change in the Community College that the "conditions of

student attendance and enrollment had worsened significantly in the last five years." He found "the comparatively low estimate of the influence of student attendance and enrollment patterns on student development "surprising" (p. 36).

In the Freshman Assessment Skills Program (FASP) at the City College of New York, Lederman in Berrian and Bonas (1981) reported classroom attendance policies that include the twofold purpose (1) of having students realize they cannot survive by "floating in and out of classrooms," and (2) that faculty, in the act of taking roll, demonstrate their interest in the student (p. 81). Roueche (1968) also reported that one third of remedial students had poor attendance patterns (p. 55).

In summary, the academic performances of students while in high school are important precursors of academic success in college. The variables most likely to predict success in college were identified as: grade point average over college preparatory courses, rank in high school class, and students' high school attendance record. Each of these variables were reported to be available for study at Gloucester County College; however, only high school class rank proved to be useable.

Standardized Entry Level Tests

In 1985, the ACT testing program reported that 75% of both urban and "non urban" colleges required some form of testing or the submission of test scores on all entering students (Bray, 1987, p. 35).

Many researchers found scores on entry level aptitude ACT, SAT and NMSQT (National Merit Scholarship Qualifying Test) to be among the best predictors for college persistence (Astin, 1971; Pascarella, Duby, & Iverson, 1983; Pascarella & Terenzini, 1980). Astin (1971) added that standardized aptitude scores, "preferably more than one, are positively related with successful grades in the freshman year in college" (p. 7).

Much controversy surrounds the use of standardized test scores such as the ACT and SAT for admission purposes, however. Resnick (1987) points out that dependence on standardized tests today creates many problems as performance on such measures is "strongly dependent on socioeconomic background and it is far from culture free" (p. 12). Wechsler (1977) also points to standardized tests as being used to "restrict enrollments" (in Vaden, 1989, p. 21). Bray (1987) concludes that tests only serve as indicators of problems and feels on site testing should be done for more "targeted and in-depth analysis" of student deficiencies in order that remediation begin as soon as

possible (p. 35). Morante (1987) adds that standardized test scores do not adequately measure student competency in basic skills (p. 57).

By the mid-seventies, demands for minimum competency testing led to the establishment of state mandated competency testing programs. Beginning in the state of Oregon in 1972, the concept encompassed the entire country (Savage, 1978, p. 12). The basic skills testing program has become a concrete demonstration of accountability for federal and state legislators to share with concerned taxpayers in their constituencies (Wise, 1978, p. 546). Florida, New Jersey, and Tennessee joined Oregon in leading the way both by imposing programs to test students after admission and prior to registration and by placing low scoring students into remedial tracks (Resnick, 1987, p. 11). With remediation it was generally felt that students could then enter regular college courses and ultimately be successful in completing a college curriculum.

While most colleges are in agreement to test students' basic skills level, many colleges do not mandate student placement into remedial or developmental programs (Spady, 1978; Suter, 1983). New Jersey is the only state currently to mandate both the test and subsequent placement into remedial or developmental levels of instruction for students failing to meet the cut score.

Many researchers found positive results in college persistence when comparing remediated students and students not needing remediation (Astin, 1985; Corcoran, 1981; Garcia-Passalacqua, 1968; Losak & Morris, 1985). Alpert, Gort, and Allan (1989) noted that, in the New Jersey report on Effectiveness of Remedial Programs (1985), "Seventy five percent of state college students and 55 percent of community college students who had completed remedial assignments were enrolled in the fourth semester, compared with 70 percent and 51 percent of nonremedial students in the respective college sectors." Their report further emphasizes "that skill-deficient students who complete the appropriate remedial course sequence have a far greater chance of college success than students who do not complete remediation" (p. 134).

Not all colleges and researchers are so positive about student success following basic skills instruction. Lavin (1965) states "ONE THING CLEAR: There appears to be little positive correlation between standardized test scores and student success in remedial courses. Instruments may be acceptable as sorting devices for regular college credit classes but whether they are adequate criteria in themselves for placing students in remedial programs is open to question" (p. 481). When Miami-Dade was voted the number one community college in the nation, Zwerling (1988) quoted a

statement in one of the college's reports, namely: "It is difficult to escape the impression that taking a remedial course for which one is eligible during the first term increases the probability of nonsuccess" (pp. 10, 13).

From the literature, it would seem that both academic aptitude (e.g. SAT) and standardized tests of "basic skills" are useful in accounting for academic persistence in college. Remaining at issue, however, is the question: does placement in remedial or developmental course(s) increase likelihood of completing a regular two year college program?

Student Academic Success in College

Academic and social adjustment in the freshman year of college are both influential in the student's decision to complete studies, according to Tinto (1975) and Pascarella (1982). However, significant differences between commuter and residential students is reported in the literature in this regard.

Most researchers found the college QCA vital to student persistence, especially among students of lower ability levels. Tinto (1975), attempting to predict academic success among college freshmen in four year residential institutions, concluded that other major variables would have to be added to background variables, high school

performance, and scores on standardized tests. These were academic and social integration.

Pascarella and Chapman (1983) and Pascarella and Terenzini (1980) report that academic integration of college students, including QCA, particularly in commuter colleges, is vital to an understanding of college persistence, while social integration is much more important to student success in residential colleges. In their study of 2,326 freshmen students attending 11 postsecondary institutions, Pascarella and Chapman (1983) also identified "affiliation needs." These include "the extent to which a person is group-centered, friendly and participative with others" (p. 90). Pascarella and Chapman (1983) found such needs significantly related to college persistence in residential students, but negatively correlated with two year college commuter students who do not live on campus and, therefore, experience less affiliation with the college and its extracurricular programs.

Summary

On the basis of the literature review, one may conclude that: many of the variables currently available at Gloucester County College can be used constructively to predict or account for differences in the persistence of its students, assuming of course that these data are complete

and accurate. These include: gender, race, age, acceptance of financial aid, type of high school attended, socioeconomic status of the general population in the high school's attendance area, size of the high school class, credits earned in high school by type of high school program, grade point average across high school subjects, rank in graduating class, whether or not student took the SAT or similar academic aptitude test, and scores on the New Jersey College Basic Skills Placement Test.

However, based on the literature review, Gloucester County College would have to collect certain other data if it wished to increase its ability to predict or account for differences among its students in their pursuit of certificate or two year degree programs. Among these are the socioeconomic factors of student background, including parents' income and education, type of high school program, whether or not the student is employed and if so, how many hours and what type of work, students' intention to remain at Gloucester County College until degree completion, purpose in coming to GCC whether enrichment, certification, or degree, and finally, student's belief that he/she can complete a certificate or degree.

Chapter 3

Research Design and Method

In this chapter, methods are described that were employed to address each of the research questions identified in Chapter 1, using data from Gloucester County College.

Population and Sample

The population of interest in this study was incoming students in New Jersey public community colleges. Of specific concern was the success of students entering Gloucester County College in pursuing an academic certificate or degree. The sample taken for study was the incoming class of Summer/Fall 1988 at Gloucester County College. Although this class may be typical of those that enter Gloucester County College, it is not argued that the results of the study of this class necessarily could be extrapolated to other New Jersey Community colleges. However, the characteristics of the Fall 1988 class are described in detail, making comparison with students at other colleges feasible.

Research Strategy

Available data were organized to address the four research questions that arose as members of the entering

Class of Fall 1988 progressed through six semesters at Gloucester County College. The following steps were taken:

1. Data on incoming students available at time of admission to Gloucester County College, New Jersey in Fall 1988 were described in detail.

2. Those data found to be complete and reasonably accurate were used to predict or account for differences in mean scores on the three entry level tests used by Gloucester County College as their basis for making the students' initial academic placement to regular or sub-collegiate level classes.

3. Test performance was used to determine the accuracy (consistency) with which students were placed initially in collegiate and sub-collegiate classes. See Cut Scores pp.44-45.

4. All available data then were used to predict or account for differences in subsequent student progress (in terms of degree credits earned) and quality of collegiate performance (as measured by QCA over credits earned).

5. Finally, all available data were used to predict or account for the level of academic attainment achieved by students after six semesters; of particular interest were the "effects," if any, of entry level test scores and initial academic placement on certificate or degree attainment after six semesters.

Instrumentation

Measures of students' personal and educational variables. The discrete variables, including gender, race, college aptitude potential (whether or not the student had taken the SAT or a similar test), and economic status (whether or not the student had accepted financial aid), were obtained from student high school transcript, college application, financial aid office and computerized College Information Services.

The continuous variables, including size of high school class and high school class rank, were obtained from student high school transcript while the socioeconomic status of the high school location was obtained from the New Jersey Department of Education.

Measure of students' performance on the New Jersey college basic skills placement test. Student scores on the NJCBSPT were obtained from the computerized College Information Service. Some editing of these data were required before use, as described later in the chapter.

Description of the New Jersey College Basic Skills Placement Test

At Gloucester County College the NJCBSPT is employed to estimate students' readiness to pursue collegiate level studies and to guide their subsequent placement into regular collegiate, developmental, or remedial level courses.

The NJCBSPT is a timed power test that is graded, with the exception of the Essay, by the college computer. It allows a total of three hours and twenty minutes to administer. The test consists of an essay and four multiple choice sections, namely: Reading Comprehension, Sentence Sense, Essay, Mathematics Computation, and Elementary Algebra (GCC State Basic Skills Report 1987-1989, p. 22.) However, GCC officials elected not to administer the Elementary Algebra Test. Accordingly, this study is limited to test results in three areas only: Reading Comprehension, English Composition (a composite of Sentence Sense and Essay), and Mathematics Computation. These are described below.

Reading comprehension. Forty-seven questions including seven pretest questions. Time: 50 minutes. Measures students' ability to:

1. Understand a written test
2. Extract main idea from test
3. Draw appropriate inferences

Passages are printed in test book, cover a variety of subjects, and represent a variety of written purposes and styles. Students are asked to identify the generalization that is supported by a group of statements or to identify the idea that best supports a given generalization.

Total possible score for Reading Comprehension is 183.

Sentence sense. Forty questions including five pre-test questions. Time: 35 minutes. Two kinds of multiple choice questions:

1. Those that require student to identify faults in sentences and make appropriate corrections.
2. Those that ask students to rewrite sentences much as they would when editing their own writing. Problems are concerned mainly with sentence structure and logic, not with grammar or punctuation.

Essay. Time: 20 minutes. Students are asked to write on two themes, one assigned, the other their own choice. At Gloucester County College two faculty members, not teaching the courses, serve as evaluators. Each reads and scores each student's essays. They are expected to consider every aspect of the writing from subject-verb agreement to organization of ideas, from use of commas to appropriateness of examples, from spelling to style.

English composition. Results of the two English tests (Sentence Sense and Essay) are combined in a single composite score for English Composition. The composite score for English Composition is used in this study. Total possible score for English Composition is 189. (Sentence Sense 181, Essay 12).

Mathematics computation. Thirty-five questions including five pre-test questions. Time: 40 minutes.

Measures students' performance of basic arithmetic operations and their application to the solution of problems that involve fundamental arithmetic concepts. Questions cover operations with whole numbers, operations with fractions, operations with decimals and per cents, and arithmetic reasoning. Total possible score for Mathematics Computation is 181 (New Jersey Higher Education Report, 1989, pp. 47-48).

Test Reliability

The reliability of the New Jersey College Basic Skills Placement Test, was determined by test developers using the Kuder-Richardson Formula 20 (KR-20). This measure examines individual items on one test rather than using such methods as alternate forms, or test-retest, reliability measures. The KR-20 formula considers the number of items, and the proportions of students responding correctly and incorrectly to each item in order to arrive at a reliability coefficient.

According to the Department of Higher Education Report, the reliability of essay scores was ascertained in a special study done by the Educational Testing Service which involved re-scoring 500 essays on a different scale and correlating

the two scores. Results of this study yielded a correlation of .80. In addition, holistic essay scoring was routinely reviewed by including previously scored essays in subsequent batches. Readers were asked to review any essays scored differently in the second batch. Also, each essay was scored by two readers; if the two readers' scores differed by more than three points, a third reading was required (Department of Higher Education, Scoring the Essays, 1984, cited in Vaden, 1989, p. 55.)

At Gloucester County College, essays were scored as required by two communications instructors not involved with teaching the courses. However, consistency in scoring may be limited as the combination of two faculty members may vary with each test offering. Since only passing results of the essay section are forwarded to the state, accountability is limited. For differences varying more than three points a third faculty member of the communications department reads and scores the essays in question.

Measures of Students' Academic Placement

Students are placed in regular college classes, a developmental class, a full developmental level including courses in personal psychology and study skills, or the remedial level by the College Basic Skills Director based on their scores on the New Jersey College Basic Skills

Placement Test. Individual scores on the NJCBSPT were obtained from the computerized data bank maintained at Gloucester County College's Information Services. Gloucester County College's rules for academic assignments are as follows:

Level 0: Regular college classes. Students who exceed cut score for each of the three tests are permitted to enroll in the regular collegiate level courses required for certification or their respective degree program, cut scores are as follows:

<u>Test</u>	<u>Total Score</u>	<u>Cut Score</u>
Reading Comprehension	183	161 and above
English Composition	189	165 and above
Mathematics Computation	181	165 and above

Developmental level I: Development classes. Students who score below the cut score for regular classes but above a second, lower cut score may be assigned to a lower level course or courses which they must complete before enrolling in a regular collegiate level course. The range of scores are:

Reading Comprehension: 136-160 Course recommended RDG 010
 English Composition: 145-163 Course recommended COM 010
 Mathematics Computation: under 165 Course recommended MAT 010

Developmental level II: Full developmental studies

program. The program consists of COM 101, MAT 010, RDG 010, PSY 100 and COM 011. An optional 1 credit physical education elective is available. All three criteria must be met in order to be placed in the Full Developmental Studies Program.

Students who fail to meet the cut scores set for regular or developmental status in all three tests are assigned to a full time program of developmental and related courses which they must complete before proceeding to their regular courses. The range of scores leading to Level II is as follows:

Reading Comprehension: 136 to 156

English Composition: 145 to 160

Mathematics Computation: Under 165.

Developmental level III (remedial). Students who score well below the cut score for regular or developmental classes are placed in a remedial program from which they are expected to progress up through both developmental and regular courses before graduation. Remedial courses are COM 001 and RDG 001. Study Skills Seminar, COM 011, is required of all remedial students; physical education is optional. The range of scores leading to assignment to remedial courses are:

Reading Comprehension: 135 and below.

English Composition: 144 and below.

Mathematics Computation: under 165

Exit criteria. In order to proceed from remedial to developmental hence to regular courses, students must be retested and subsequently meet or exceed established cut scores on an alternate form of the New Jersey College Basic Skills Placement Test, as follows:

<u>Course</u>	<u>Level</u>	<u>Test</u>	<u>Cut Score</u>
COM 001	(remedial)	English Composition	145 and above
COM 010	(developmental)	English Composition	165 and above
RDG 001	(remedial)	Reading Comprehension	136 and above
RDG 010	(developmental)	Reading Comprehension	161 and above
MAT 010	(remedial and developmental)	Mathematics Computation	165 and above

(Gloucester County College Institutional Report of Remedial Program Effectiveness 1988-1990, pp. 7-8).

To illustrate, a student who scored 130 on the Reading Comprehension test normally would be placed in RDG 001 (remedial level). After completing this course, the student would proceed to RDG 010 (developmental level) after which time s(he) would be reexamined. If s(he) scored 161 or greater, (s)he could proceed to regular collegiate level classes. If not, student would have to repeat the developmental course.

Valid Use of Test

Validity, an indication of whether the NJCBSPT measures the subject it is designed to measure, has been argued by test developers in three areas: content validity, concurrent validity, and placement validity. In terms of content validity, the state advisory committees of experts reviewed test questions and examined pretest statistics for new items (Department of Higher Education, *Interpreting Mathematics Scores*, 1984, cited in Vaden, 1989, p. 55). An additional content validity study involved two questionnaires for reading, writing, and mathematics tests distributed to college instructors in New Jersey who seemed to be in agreement that the test was, indeed, testing what it purported to test (Hecht, Validation of the New Jersey College Basic Skills Placement Test, 1980, pp. 7-10).

In an unpublished report (1980) copyrighted by the Educational Testing Service, concurrent validity was addressed. Scores for 822 students at Mercer County College were compared on both the NJCBSPT and the College Boards Comparative Guidance and Placement Program (CGP). Both tests were designed to serve similar purposes. The CGP test had previously undergone extensive validity studies. A relatively high correlation was found between the two test batteries (Hecht, 1980, p. 12). Correlations for the mathematics sections for the two tests were 0.67 for

computation and 0.72 for algebra (Vaden, 1989, p. 55).

The ETS report also distinguished between the effectiveness of a placement test (such as the NJCBSPT) and the effectiveness of a placement program using those test scores as criteria for placement (p. 17). The report further states that should a placement test be used in an inappropriately designed placement program, "There is no way to separate the effects of the program from the effects of the test, and the whole venture may be doomed from the start" (p. 17).

Measures of Students Academic Performance During Six Semesters

Student progress includes only those credits student earned toward a degree or certificate and the grade point average over those credits. These data were obtained from each student's college transcript. Only "in-house" credit was awarded for successful completion of developmental or remedial courses; they are not transferable to other colleges nor are they applicable toward the required number of credits for graduation. Gloucester County College's official records, however, were designed to track each student's total or cumulative course hours attempted (i.e. both credit and non-credit courses) but data entries were inconsistent in this regard hence eliminated from the study. Only cumulative regular collegiate credits earned were

useable.

Measures of Students' Academic Status After Six Semesters

Includes current status of student, i.e. whether dropped out, retained in good standing, or graduated after six semesters. Information obtained from student college transcript.

Data Collection Plan

Data were collected from the following sources: The high school transcript provided background characteristics, including name, gender, age, class rank/grade point average, total number of credits earned, number of liberal arts, science, and math courses studied, attendance and lateness patterns during four years of high school and, for those who volunteered, standardized test scores for the Preliminary Scholastic Aptitude Test (PSAT) and the Scholastic Aptitude Test (SAT) or American College Test (ACT). The college application was an additional source of this information making it possible to verify the student's name, gender and age. The college transcript provided additional data, including: number of college credits earned, and the Q.C.A. over earned college credits, as well as background characteristics of age, race/ethnicity, and PSAT, SAT, or ACT scores.

With the exception of the high school transcript, which

was found in individual student files in the College Student Services Center, all other information, including the New Jersey College Basic Skills Placement Test scores, was obtained through the computerized College Information Service. Additional information on the high school area socioeconomic status was obtained through the New Jersey State Department of Education. A statement of confidentiality, requested by the administration of Gloucester County College prior to beginning the study, was filed with the college.

Data Utility Problems

High school and college data were collected primarily from the College Information System and Student Personnel Department. Information on the socioeconomic status of high school location was obtained from the State Department of Education. The State Department of Higher Education also cooperated by sharing reports on the New Jersey College Basic Skills Placement Test. All records pertaining to the College and State Department of Education were computerized, accessible, and organized.

High school transcripts presented a major problem in this study. They were not computerized and there was no consistency within transcripts whether statewide or county; many high school transcripts were disorganized and copied by

poor quality xerox machines making legibility extremely difficult in many instances.

There were multiple abbreviations for courses with no accompanying course description. Many of the transcripts contained grades and other pertinent information only through the junior year of high school. Additionally there was much missing data to the point where, on a few transcripts, it was difficult to ascertain if a student had actually graduated.

Some extremely relevant information to this study e.g. class rank and grade point average, often were not recorded. In other instances the information was recorded with no grading scale making it impossible to have any type of standardization between various high schools.

Though all schools had individual profiles, there was no central location either in the college offices, office of the county superintendents of schools, or office of the State Department of Education where information on each high school could be retrieved. No information pertaining to private schools is kept by state or county officials.

When attempting to gather information from high school personnel, some of the guidance counselors had to refer to other people to validate the equivalence of an A grade versus a weighted A grade. Others excused themselves to consult a high school handbook, still other schools had

departmental secretaries who readily extended the information.

Many high schools gave information without identification of any kind-even a name. Others inquired as to purpose of questions. Most schools were very cooperative, none more than Gloucester County College whose administrators and staff aided this study in every way possible.

Data Editing Plan

As in an original survey, the data gleaned from the several reports and documents for each of the 718 members of the Summer/Fall 1988 cohort of students first entering Gloucester County College New Jersey were organized around a set of research operations, as identified in Chapter 1 of this document. Four specific steps were taken to edit and organize these data for analysis:

Data from the various sources were entered into the Number Cruncher Statistical System program (NCSS v 5.1) and a frequency distribution tabulated for each variable. Distributions were checked for obvious errors (e.g. outliers that exceeded the known range of distributions) and for frequency of missing data, due either to incomplete or inadequate reporting or record keeping.

Specific data from high school transcripts, college

entry tests, and admission, personnel, and financial records at Gloucester County College were assessed for accuracy and completeness. Data for some individuals and for some classes of individuals were missing from several of the reports. For example, entry level test data were not available for the 25 transfer students among the 718 members of the Summer/Fall 1988 cohort. State reports of the socioeconomic status (SES) of high school locations applied only to the New Jersey public high schools. Accordingly, the SES estimate of high school area populations was available only for the 539 members of the 1988 cohort who were graduated from New Jersey public high schools.

As reported later in Chapter 4, not all available data were employed to address the research questions in this study. Some variables were not relevant; others were discarded not so much for irrelevance as for lack of a uniform metric. Chief among these otherwise interesting variables discarded for measurement purposes were high school grade point average (there were too many irreconcilable grading scales used to describe high school performance) and high school attendance and tardiness reports (these reports were not uniformly supplied on high school transcripts).

Data Analysis Plan

The purpose of this study was largely exploratory. The primary concern was to identify those personal and educational attributes of incoming students which, when combined with entry level test scores, might best predict their subsequent academic performance and ultimate academic success at Gloucester County College. The application of various statistical tests in analyzing these data was not for the purpose of testing an hypothesis or advancing a particular theory of college persistence, as for examples: those of Tinto (1975), Astin (1975) or Pascarella (1982), discussed earlier in Chapter 2. Indeed, Gloucester County College would have to expand its student data base very considerably to support such theory-based study of college persistence. Therefore, in the absence of a controlling theory, results of these tests are considered to be tentative and suggestive of possible explanations of relationships.

The analyses of data for this study were divided into two key parts namely: (1) a detailed description of the entering class of Gloucester County College, New Jersey students in Fall 1988 to enable readers to "see" the class profile, particularly with respect to educational "risk," and (2) an analysis of each of the principal research questions raised in Chapter 1, as follows:

For Question 1, differences in mean scores on the NJCBSPT for Reading Comprehension, English Composition, and Mathematics Computation were examined for possible relationships with gender, and each of the other personal and educational attributes of students available at time of entry, using the GLM ANOVA program of NCSS v 5.1. Entry level test scores also were grouped into two categories based on Gloucester County College's established cut scores for pass/fail. The relationship between students' personal and educational characteristics and their pass/fail performance on each of the three entry level tests were examined by the Chi-squared statistic.

Variables found to be significantly related to subscores of the NJCBSPT were then entered into the stepwise multiple regression program of NCSS v 5.1 to see which variables, individually or in combination, might best predict or account for the observed differences in Reading Comprehension, English Composition, and Mathematics Computation scores of the New Jersey College Basic Skills Placement Test.

Question 2- How consistent were Gloucester County College's academic assignments of students to regular, developmental or remedial level courses with students' performance on entry level examinations? As cited earlier, the subjects' test scores were divided into two groups;

namely: (1) at and below the official cut score (coded 0) and labeled "fail," and (2) above the official cut score (coded 1) and labeled "pass" for each of the three subsets of the entry level test.

A 2x2 contingency table was constructed with student performance (pass/fail) on one axis and academic placement (regular/other) on the other. The Chi-squared statistic was employed to estimate significance of differences in distributions.

Three different computations were made for Question 3, namely: which variables (personal attributes, high school performance, entry level test scores, or level of academic placement), individually or in combination, might best predict or account for differences in college academic performance (degree credits earned; grade point average). These were:

1. Using number of college credits earned as criterion, GLM ANOVA was employed to determine the relationship, if any, with each of the students' personal and educational variables, pass/fail scores on the entry level tests, and subsequent academic assignment. This was repeated using students' QCA over earned college credits as criterion.

2. Using credits earned as criterion, the statistically significant variables from computation 1 above were entered into the multiple regression program of

NCSS v 5.1 to determine which of these variables, or combination thereof, might best account for differences in credits earned. This process was repeated for QCA.

3. Using pass/fail test scores and academic assignment as independent variables, a 2-way ANOVA was employed to surface any main or possible interaction effects on credits earned and QCA.

A two step analysis was used to address Question 4, namely: which variables individually or in combination best predict or account for differences in academic status attained by the 718 students after six semesters? First, the Chi-square statistic was used to select variables most likely to be related to the final academic status of the 718 students. Second, these variables were entered into the discriminant analysis program of NCSS v. 5.1 to determine which of these variables, individually or collectively, could correctly identify the majority of students as dropouts, persisters, or graduates.

Chapter 4

In the Fall semester of 1988, 718 full time and 686 part-time students entered Gloucester County College (GCC). Of the full time students, 25 transferred to Gloucester County College after completing one or more terms at another college. The remaining 693 full time students were admitted as freshmen and given the New Jersey College Basic Skills Placement Test to assist college authorities in assigning each student to the most appropriate level of instruction. Largely on the basis of their test scores, the 693 full time entering freshmen students were assigned to regular, developmental, or pre-collegiate remedial classes. The 25 transfer students were not retested by Gloucester County College. Rather they were permitted to enroll in regular classes appropriate to their prior preparation at another college.

The majority (i.e. 423 or 58.9%) of the 718 students dropped out (or in 22 cases were terminated by the college) but 196 or 27.3% students persisted through a one-and-one-half or two year program of study and were graduated with an associate degree or certificate. As of Spring 1991, 99 or 13.8% of the original 718 students were still enrolled at the college. In subsequent sections of this chapter, attention is drawn to results of three tasks namely:

1. To describe the personal and educational characteristics or attributes of the 718 full time students who entered Gloucester County College for the first time in the Summer/Fall of 1988. Fourteen such variables were identified in Chapter 2. However, several were not useful in this study, as described in Chapter 2. Those included in the study were: students' age, gender, race, the type and socioeconomic status of the high school from which they were graduated, high school class rank, whether or not they completed the SAT or related scholastic aptitude test, and whether or not they accepted financial aid to attend Gloucester County College. As related later in this chapter, not all variables identified in other studies as possible predictors of college performance were available in useful form at Gloucester County College;
2. To trace students' progress in the college's academic programs from the entry level placement examinations in 1988 through Spring 1991, ending in graduation, continuing study, or withdrawal;
3. To identify those variables, if any, that best account for differences in students' entry-level examination scores, their initial academic

assignment, and their subsequent progress over six semesters toward completion of their one and one-half or two year college programs of study.

Characteristics of the Fall 1988 Student Cohort

In the first section of the chapter, attention is drawn to the principal personal and educational characteristics or attributes of the 718 students.

Personal Characteristics of Students

Three personal characteristics of incoming students were taken from high school transcripts or college admission forms. These were: gender, age, and race.

Gender. Seven hundred and eighteen full time students entered Gloucester County College in the Fall of 1988. Of these 338 (47.1%) were male and 380 (52.9% were female).

Age. The vast majority of students (87.2%) who entered Gloucester County College for full time study in the Fall of 1988 did so immediately or within at most four years following their graduation from high school. In this sense, most would be considered to be "traditional" rather than "non-traditional" students. Their average age at time of admission (20.5) years would not differ markedly from that of incoming full time students at New Jersey's four year colleges. Most older students at Gloucester County College

would be found among its part-time students. Accordingly, age data were not included in subsequent analyses.

Racial or ethnic origins. The majority of full time students (591 or 82.3%) indicated on their application to Gloucester County College that they were Caucasian (white). Only 70 or 9.7% were African-American. Twenty or 2.8% students were identified as other minorities. No Native American students were in this cohort. There was no record of race for 37 students. See Appendix Table 1.

Given the limited number of non-white minority students in the Fall 1988 cohort, race was eliminated from all but descriptive analyses, although of substantive and professional interest to the college. Statistically significant differences between white and non-white students could be expected to result simply from differences in sample size, whether or not substantive differences in performance occurred.

Characteristics of High Schools Attended

Three characteristics of high schools attended were examined. These were: type of high school (public, private), class size, and socioeconomic status of the general population within the high school attendance area. Results were:

Type of high school. As shown in Appendix Table 2, student records were organized by three types of high schools: New Jersey public high schools, New Jersey private high schools, and other high schools including out-of-state schools. Of the 718 members of the 1988 Fall cohort, 539 or 75% were graduated from New Jersey public high schools, 88 or 12% from New Jersey private high schools, 51 (7%) from other high schools mostly from out-of-state, plus 40 students (6%) who received a General Education Diploma. Due to the limited number of private high schools attended by students entering Gloucester County College in the Fall of 1988, type of high school was eliminated from all but descriptive statistics.

Size of high school class. The average size of the graduates' high school class was 240 members. The smallest class had 23 members, the largest 921. The median class size was 206 members. See Appendix Table 3.

Socioeconomic status of high school. The New Jersey Department of Education assigned an estimate of socioeconomic status to each of the state's public high school attendance areas, based on a factor analysis of 1980 census data (Derivation of the District Factor Groups (DFG)). Ten socioeconomic categories were constructed. They ranged from lowest (1) to highest (10). Similar data were not available for private or out-of-state high schools

represented in the Fall 1988 cohort at Gloucester County College.

The 539 students from New Jersey public high schools were heavily concentrated among the lower socioeconomic categories, as summarized in Appendix Table 4 where 423 or 78.5% of the students were graduated from public high schools in the five lowest; only 116 students or 21.5% graduated from public high schools in the five highest SE S categories.

Student High School Performance

Total high school credits. Included in the data for each student were students' total credits earned while in high school. Total credits were reported for 469 students. However, there was no standardization in reports of high school credits. Some high schools, principally private, based their credits on the Carnegie Unit. Most public high schools based their credit value on a point system, some of which included 6 points, others 5 points, others 4 points. The mean number of credits was 122, with a low of 17.5, a high of 151.5, and a median number of high school credits of 125. It was infeasible to standardize these various scales. Accordingly, cumulative high school credits were dropped from the study.

High school grade point average. Student's high school grade point average was reported in Chapter 2 as one valid

predictor of college persistence, hence considered for inclusion in this study. Three hundred and sixty-two student transcripts recorded a student grade point average. But the schools did not employ a uniform scale for calculating grade point averages. Accordingly, the high school GPA was not included in the study. This is another area where standardization of documents could improve the education data base in New Jersey.

Class rank. As a measure of student performance, the student's relative standing in their graduation class was noted. Five hundred forty-two student transcripts provided information both of class size and students' rank in class. However, some schools failed to state clearly whether the class size they reported was for junior or senior class. Both were included in the study. From other studies, it was clear that rank in class alone was not an effective predictor of graduate's subsequent performance in college. Rank in class had to be modified by size of class. Therefore, class rank in this study was defined as

$$1 - \frac{\text{Rank}}{\text{HS Class Size}}$$

If students ranked first in their class, their rank index in this study approached 1. If students ranked last in their class, their rank index was 0. For ease in description, the class rank index of the 542 students was

divided into three groups: (1) lowest (i.e. 1st quartile); (2) middle two quartiles, and (3) highest (i.e. 4th) quartile.

One hundred thirty-five or 24.9% of the 542 entering students whose transcripts offered class rank, ranked in the lowest quartile of their junior or senior high school class. Of these 84 or 62% were males and 51 or 38% were females. There were 272 ranked in the middle half (2nd and 3rd quartiles) of their high school class. Of these 122 or 45% were male and 150 or 55% were female. Of the 135 students ranked in the upper (4th) quarter of their high school class, 46 (34%) were male and 89 (66%) were female. As noted in Table 5 in the Appendix, differences by gender were significant ($X^2_{(2)} = 22.0897$ $p < 0.001$) but relatively weak, Cramer's $V = .20$.

Courses taken. To better assess the academic preparation of each student, data on total number of high school courses in language arts, mathematics and science were taken. Six hundred thirty-one student transcripts reported specific course offerings. The number of courses in Language Arts ranged from a high of 12 to a low of 0 with an average of 8; number of courses in Mathematics ranged from a high of 6 to a low of 0, with an average of 3; courses in Science ranged from a high of 6 to a low of 0,

with an average of 3. The number of courses taken by the entering students at Gloucester County College in Fall 1988 in general agree with research in the literature which states that most community college students enter from general education curriculums (Goldberg, 1991, p. 5). Siegel and Anderson (1991) however, report that students make choices in course selection to protect their GPA and class rank (pp. 101-102). Although these data held some promise for future analysis, differences in course titles and descriptions on high school transcripts were too great to warrant inclusion in this study.

Attendance and lateness. Student attendance and lateness were reported by Creamer (1989), Roueche (1968), and other researchers in the literature to be a significant predictor of student performance. The data available in this study from high school transcripts that reported attendance (318) and lateness (284) were insufficient to be used in this study. However, of available data recorded, 318 students were absent an average of 38 days during four years of high school (a range of 0 through 219) and 284 students were tardy an average of 12 times (a range of 0 through 114). Differences by gender were not examined.

Scholastic aptitude test takers. Of the 718 students entering in the Fall of 1988, 446 (62%) provided an SAT, PSAT, or ACT test score at time of admission. Of scores

offered, the average verbal Preliminary or Scholastic Aptitude Test score was 384 and the average math score was 404 (where the national mean both for verbal and math scores is 500 and the standard deviation is 100). The average composite score for students offering the American College Test (ACT) was 17 (the national mean in 1982 was 18.2). (Book of Multiple Measurement, 1982). Judging from the average scores attained by the 446 SAT test takers, the entering cohort was not academically gifted.

For purposes of this study, however, the actual SAT or related test scores were not used. Rather a new variable was created; namely: "SAT Test Taker" (Yes, No). If the entering student at Gloucester County College had taken any one of the standard precollegiate scholastic aptitude tests, it was assumed that students would be more motivated if not more academically or financially able than non-test takers to attend college, hence a promising predictor of subsequent performance at Gloucester County College.

There were no significant gender differences between those who took the SAT or equivalent scholastic aptitude test and those who did not. (See Appendix Table 6).

Acceptance of financial aid. Of the 718 students in the Fall cohort of 1988, 230 or 32% accepted some form of federal or state aid. Differences between students who accepted or did not accept financial aid were significant by

gender ($X_{2(1)} = 30.1598$ $p < 0.001$) Appendix Table 7a, and whether or not student took the SAT or other scholastic aptitude test ($X^2_{(1)} = 25.9523$ $p < 0.001$). See Appendix Table 7b. There was no relationship between class rank and financial aid, however. See Appendix Table 7c.

In general, those who accepted financial aid tended to be students who attended public school from a lower socioeconomic area, and who failed to take the SAT or equivalent scholastic aptitude test.

Summary of Personal and Educational Attributes

In summary, most new full time students who entered Gloucester County College, New Jersey in the Fall of 1988 were white, attended relatively small New Jersey public high schools in economically depressed areas of the state, generally met but did not exceed minimum curriculum expectations while in high school, and ranked in the middle (second and third quartile) of their high school class. Only one-third of the entering freshmen sought financial aid.

On balance the 1988 cohort would appear to be comprised largely of high risk students with a limited expectation for completing college during the six semesters included in this study. Whether assignment of the least accomplished of

these to sub-collegiate level studies would heighten their chances of college completion remained to be seen.

Personal and Educational Attributes of the 1988 Cohort and Entry Level Test Scores

In the two sections, that follow, two questions are addressed: How well did the Fall 1988 incoming students perform on the mandated New Jersey College Basic Skills Placement Test, and which of the personal and educational attributes of these students, if any, best accounts for differences in their scores on these tests?

Univariate analyses were used to address the first of the two questions and to identify potential predictor variables to be used in addressing the second question.

Multiple regression analysis was employed to account for differences in individual scores on each of the three placement examinations. All but 25 of the 718 entering students in Fall 1988 were required to take the state test battery. The 25 transfer students were exempted. Ostensibly, they had taken the test earlier at another institution.

Of the 693 test takers, 323 or 47% were male, 370 or 53% were female. Each student took three tests, including: Reading Comprehension, English Composition (itself comprised of two sub-tests, namely: Sentence Sense and Essay), and Mathematical Computation. There were a total of $4 \times 693 =$

2772 recorded scores. Of the 2772 scores, 28 clearly were spurious, e.g. one or two digit scores were entered where three digit scores should have been recorded. Such errors appeared to be randomly distributed. They were adjusted in accordance with the individual's relative position on the other tests and his/her subsequent academic placement by admission officers. If an individual had been assigned to a regular college class in the test area, the group mean score for that test replaced the spurious score. If the individual had been placed in a developmental or remedial class, a score one point below the cut score for that test replaced the spurious score. With so few recorded errors, however, few effects on results were expected.

Student attributes and reading comprehension. Of the 693 students who attempted the Reading Comprehension Test, a total of 389 or 56% passed by exceeding the cut score.

Gender and reading comprehension. Of the 323 males taking the test, 177 or 55% passed and 212 or 57% of the 370 females also passed. These differences were not statistically significant. ($X^2_{(1)} = 0.4372$ $p=0.5085$). See Appendix Table 8a.

Class rank and reading comprehension. High school class rank data were available for 525 of the 693 test takers. Of these, 132 fell in the first or lowest quartile

of their high school class, 265 in the middle half, and 128 in the fourth or top quartile. High school class rank was clearly related to passing scores on the reading examination. Whereas 42% of those students who ranked in the lowest quartile of their high school class were among those who exceeded the cut score in reading, 61.5% of those in the middle half of their high school class, and 72% of those in the upper quartile passed the reading examination. Differences by class rank in percent of those who passed the reading comprehension examination were statistically significant ($X^2_{(2)} = 24.4858$ $p < 0.001$). See Appendix Table 8b.

Scholastic aptitude test taker and reading comprehension. Only 431 or 62% of the 693 test takers earlier completed the Scholastic Aptitude Test (SAT) or equivalent aptitude test while in high school. Nonetheless, there was a significant relationship between taking such a test and earning a passing grade on the New Jersey examination in Reading Comprehension. Of the 431 who took an academic aptitude test, 273 or 63% passed the Reading Comprehension examination as compared to 44% of those who failed to volunteer to take the SAT or equivalent test. Differences in percent were statistically significant ($X^2_{(1)} = 24.06$ $p < 0.001$) for scholastic aptitude test takers. See Appendix Table 8c.

Financial aid and reading comprehension. Accepting financial aid, here interpreted as a metaphor for student SES, also was significantly related to passing scores on the reading examination. Only 230 or about one-third of the test takers accepted some form of financial aid. Over 51% of the 118 students accepting aid failed the reading examination as opposed to 40% of the 463 not accepting aid. Differences were statistically significant ($X^2_{(1)}=7.7327$ $p<0.0054$). See Appendix Table 8d.

Socioeconomic status of New Jersey public high schools and reading comprehension. Although a greater proportion than expected of low SES students (as measured by financial assistance) failed the Reading Comprehension examination, the SES of the high schools from which Gloucester County College's incoming students were graduated was not predictive of success on the examination.

In making this determination, the 10 SES categories or divisions used by State authorities to grade the attendance areas of its public high schools were recoded to two categories: "Low SES" including divisions 1-5 and "High SES" including scale divisions 6-10.

Of the 718 incoming students in Fall 1988, 539 came from New Jersey public high schools. See Appendix Table 4. Of the 539, 18 were among the 25 transfer students who did

not provide test scores on the NJCBSPT, leaving 521 test takers who were graduated from a New Jersey public high school. Of the 521 test takers, 410 or nearly 79% came from low SES high schools, 111 or 21% from high SES high schools. Differences in percent, however, were not significant. See Appendix Table 8e.

Summary of students relationship with reading comprehension. Of the five potential predictors of a pass/fail score on Reading Comprehension, three had a significant bivariate relationship with reading. These included: high school class rank by quartiles, scholastic aptitude SAT test taker (yes/no), and financial aid (yes/no). No significant differences in percent pass/fail scores were noted for gender or SES of high school.

Student Attributes and English Composition

When students' scores on the Sentence Sense and Essay tests were combined by GCC admission authorities to form a composite score for English Composition, only 299 or 43% of the 693 test takers exceeded the cut score of 160 for English Composition.

Gender and English composition. Of the 323 males, 106 or 33% passed the English Composition test while 193 or 52% of the women passed. Differences in the percent of women and men who exceeded the cut score for English Composition

were statistically significant ($X^2_{(1)} = 26.3$ $p < 0.001$). See Appendix Table 9a.

High school class rank and English composition. Of the 693 test takers, 525 or about 75% provided information on their class rank in high school. Of the 132 in the lowest quartile, 74% failed the English Composition tests as opposed to 58% in Reading Comprehension. Of the 265 in the middle quartiles, 136 or 51% failed, while only 49 or 38% of the 128 in the top quartile failed the test. These differences in percent were statistically significant ($X^2_{(2)} = 33.6258$ $p < 0.001$) as seen in Appendix Table 9b.

Scholastic aptitude test taker and English composition. Students who took the SAT or equivalent test while in high school tended to do better on the English Composition tests upon entering Gloucester County College. Of the 431 who took the SAT or similar test, 224 or 52% passed. By contrast only 75 or 28.6% of the 262 who failed to take the SAT while in high school passed the English Composition examinations. Differences in percent were statistically significant ($X^2_{(1)} = 36.21$ $p < 0.001$). See Appendix Table 9c.

Financial aid and English composition. Only one-third of the 693 full time students who took the English Composition examination accepted some form of financial aid. About 38% of those who accepted aid passed the English

Composition tests as compared to 46% of those who did not accept financial aid. These differences were statistically significant. ($X^2_{(1)} = 3.9714$ $p=0.0463$) See Appendix Table 9d.

New Jersey high school SES and English composition. Of the 718 students who entered GCC in Fall 1988, 539 or 75% were graduates of New Jersey public high schools. The New Jersey State Department of Education estimated the socioeconomic status (SES) of these public high schools. Of the 539 students, 18 did not take the entry level tests, of the remaining students, 410 or 79% attended high schools in the lower SES half of the schools and 111 or 21% in the upper SES half. Differences were not significant. See Appendix Table 9e.

Summary of Student Attributes and English Composition

Of the five variables examined, only SES of high school area was unrelated to pass/fail scores on English Composition. Students who passed were most likely to have ranked in the upper quartiles of their high school class, have volunteered to take the SAT or equivalent scholastic aptitude test while in high school, and passed up any form of financial aid to attend Gloucester County College.

Student Attributes and Mathematics Computation

Students entering Gloucester County College, were not required to take the State prescribed Algebra examination. Rather they took the prescribed examination in Mathematics Computation. Of the 693 students taking this examination, 331 or nearly 48% exceeded the official cut score of 164. By comparison, 43% passed the English exam and 56% the exam in Reading Comprehension.

Gender and mathematics computation. Of the 323 males, 160 or nearly 50% passed, while 171 or 46% of the 370 women passed. These differences were not statistically significant. See Appendix Table 10a.

High school class rank and mathematics computation. Of 525 test takers with class rank indicated on their high school transcripts, 132 entered GCC from the lowest quartile of their high school class, 128 in the 4th quartile, and 265 in the middle two quartiles. Of the 132 bottom quartile students, only 38 (29%) passed the Mathematics Computation test. By contrast, 135 or 51% of the 265 middle quartile students passed, and 93 or nearly 75% of the 128 students in the fourth quartile passed the Math Computation test. These differences were statistically significant ($X^2_{(2)} = 50.0487$ $p < 0.001$). See Appendix Table 10b.

Scholastic aptitude test taker and mathematics computation. Of the 431 students who took a pre-admission SAT or similar test, 243 or 56% passed the Mathematics Computation test. Only 88 or 34% of the 262 students who did not take the SAT passed. Differences were significant ($X^2_{(2)} = 49.3566$ $p < 0.001$). See Appendix Table 10c.

Financial aid and mathematics computation. The 230 students who accepted financial aid were less likely than those not accepting aid to pass the mathematics test. Only 97 or 42% of aid recipients passed as compared to 51% of those not requiring financial aid. These differences were statistically significant ($X^2_{(1)} = 4.3107$ $p = 0.0379$). See Appendix Table 10d.

Socioeconomic status of high school area and mathematics computation. Of the 539 graduates of New Jersey public high schools taking the Mathematics Computation examination, 18 were transfer students and did not take the examination. Of the 521 students who took the exam, 410 or 79% were from high schools located in low SES areas and 111 or 21% were high schools located in high SES areas. Differences were not statistically significant. See Appendix Table 10e.

Summary of Student Attributes and Mathematics Computation

Of the five variables examined only three were significantly related to Mathematics Computation. These were high school class rank, whether or not the student took the SAT or equivalent scholastic aptitude test, and whether or not the student accepted financial aid. Less than half of the 693 test taking students exceeded the cut score in Mathematics Computation. Successful students tended to rank high in their high school junior or senior class, take the SAT test or another equivalent aptitude test, and not receive financial aid.

Summary of Univariate Analysis

Of the original fourteen variables reported in the literature to influence students' scores on entry level examinations, four were found at Gloucester County College's 1988 beginning class to be significantly related to students' scores on one or more of the college's entry level examinations. These were: gender, high school class rank, SAT or equivalent scholastic aptitude test taker, and socioeconomic status, as measured by acceptance of student financial aid but not by SES of high school attendance area. Exactly the same results were found when differences in means of raw scores on the three entry level tests were examined by GLM ANOVA. Mean differences are cited in

Appendix Tables 11a, 11b, and 11c.

Predictors of Student Performance on Entry Level Tests

In addressing Research Question 1, the four variables found to be significant in preliminary analysis were entered into a regression equation to determine which, individually or in combination, might best predict the students' scores on each of the entry level examinations.

Student characteristics and reading comprehension.

The three variables earlier identified in the univariate analysis were entered into the NCSS program for stepwise regression. These were: class rank, SAT test taker, and financial aid, with Reading Comprehension as criterion.

As shown in Table 4.1, about 11% of the variance in Reading Comprehension scores was accounted for by the three student characteristics of the 693 test takers. Two of the regression coefficients were significantly different from zero, namely: high school class rank, and scholastic aptitude test taker). This suggests that students scoring well on the Reading Comprehension test did well in high school and took the SAT or equivalent scholastic aptitude test.

Student characteristics and English composition. This procedure was repeated, using English Composition scores as criterion, and all four variables as predictors. As shown in Table 4.2, less than 16% of the variance in scores on

Table 4.1

Stepwise Regression of Reading Comprehension Score Over High School Class Rank, Scholastic Aptitude Test Taker (SAT), and Financial Aid

Stepwise Regression

Dependent Variable: Reading Comprehension

Independent	S-Est	R2-Add	R2-Xs	t-Value	Prob
HSCLASSRANK	0.29	0.055	0.023	6.9	<0.001
SATTESTTAK	0.14	0.020	0.023	2.9	<0.001
FINANCAID	0.12	0.002	0.040	- 1.0	0.290

R-Squared 0.1130 F-Ratio = 17.00 p<0.001
Adjusted R Squared 0.1078

Correlations

	HSRANK	SATTSTER	FINAID	RDGCMPSCR
HSCLASSRANK	1.00	0.15	0.06	0.26
SATTESTTAK	0.17	1.00	-0.18	0.18
FINANCAID	0.06	-0.18	1.00	-0.05
RDGCOMPSCR	0.26	0.18	-0.05	1.00

Table 4.2

Stepwise Regression of English Composition Scores over Gender, High School Class Rank, Scholastic Aptitude Test Taker (SAT), and Financial Aid

Stepwise Regression

Dependent Variable: English Composition Score

Independent Variables	S-Est	R2-Add	R2-Xs	t-Value	Prob
HSCCLASSRANK	0.28	0.09	0.07	6.7	<0.001
SATTESTTAKR	0.18	0.05	0.03	4.3	<0.001
GENDER	0.13	0.04	0.05	3.1	<0.001
FINAID		0.00	0.06	1.0	<0.297

R-Squared 0.1595 F-Ratio = 24.66
Adjusted R Squared 0.155- p<0.001

Correlations

	HSRANK	SATTSTER	GENDER	FINAID	ENGCOMPSC
HSCCLASSRANK	1.00	0.15	0.21	0.05	0.29
SATTESTTAKR	0.17	1.00	0.02	-0.18	0.23
GENDER	0.21	0.02	1.00	0.17	0.19
ENGCOMPSCR	0.29	0.23	0.19	-0.04	1.00
FINAID	0.05	-0.18	0.17	-0.04	

English Composition was accounted for by the four independent variables. Three of the four variables were significant contributors: gender, class rank, and scholastic aptitude test taker. This suggests that students who do well on the entry level test of English Composition are most likely to be female students who ranked well in high school and took the SAT or equivalent standardized aptitude test.

Student characteristics and mathematics computation.

Similar results were obtained when Mathematics Computation test scores were regressed over the three independent variables as shown in Table 4.3. Over 18% of the variance in the mathematics scores were accounted for by the three variables. Only two of the three variables were statistically significant: high school class rank and SAT test taker. This suggests that students who scored well on the Mathematics Computation test also do well in high school and take the SAT or other equivalent scholastic aptitude test.

Summary of Student Characteristics and Entry Level Test Scores

A small but statistically significant proportion of the variance in entry level test scores was accounted for by a combination of student related variables. Acceptance of

Table 4.3

Stepwise Regression of Mathematics Computation Scores Over High School Class Rank, Scholastic Aptitude Test Taker (SAT), and Financial Aid

Stepwise Regression					
Dependent Variable:		Mathematics Computation Score			
Independent	S-Est	R2-Add	R2-Xs	t-Value	Prob
HSCLASSRANK	0.28	0.132	0.028	9.2	<0.001
SATTESTTAK	0.13	0.027	0.028	4.2	<0.001
FINANCIAID		0.002	0.038	1.1	0.290
R-Squared		0.186	F-Ratio = 39.65		
Adjusted R Squared		0.181	p<0.001		
Correlations					
	HSRANK	SATTSTER	FINAID	MATHCOMPSC	
HSCLASSRANK	1.00	0.15	0.06	0.35	
SATTESTTAKR	0.17	1.00	-0.18	0.23	
FINANCIAID	0.06	0.18	1.00	-0.05	
MATHCOMPSC	0.35	0.23	-0.05	1.00	

financial aid was not a factor in the prediction of scores on any of the entry level tests. Gender was a factor only in English Composition. By contrast, high school class rank and scholastic aptitude test taker were significant predictors of test scores in all three examinations. In summary, those most likely to score well on all three test areas are students who ranked high in their high school class and took the SAT or equivalent standardized college aptitude test.

Entry Level Test scores and Initial Academic Placement

Entry level test scores were employed by Gloucester County College to place students in regular or sub-collegiate courses in accordance with cut scores described in Chapter 3. In this section, attention is given to the second research question, namely: How consistent were these initial academic placements with students' scores on entry level examinations?

Academic placement and entry level test results. Each of the 693 members of the Fall 1988 student cohort who took the New Jersey Basic Skills Tests were assigned to one of four academic levels, each corresponding to student scores on the entry level basic skills test. These are: regular college level courses, developmental level one, developmental level two, and sub-collegiate or remedial level basic skills courses. The 25 transfer students were

assigned to regular collegiate level courses without benefit of entry level test scores.

Students who failed to exceed the cut score established for the four entry level tests were denied admission to regular college classes until they had completed one or more sub-collegiate remedial or developmental courses. These instructional sections are roughly hierarchical in nature, ranging from clearly sub-collegiate courses in Reading Comprehension, English Composition, and Mathematics Computation through the two developmental stages to regular collegiate level courses. Students who are enrolled in remedial courses must proceed through a developmental stage before entering regular collegiate level courses. Although an official record is kept of their performance in these pre-collegiate level courses, no credit toward a collegiate certificate or associate degree is awarded. Students in developmental level II also take a course in interpersonal psychology and a study skills seminar intended to build their basic capacity to perform at the collegiate level. Results are summarized in Table 4.4.

Of the 718 total members of the Fall 1988 cohort, including 25 transfer students, 225 or nearly 31% were assigned by their individual test score to regular collegiate level courses, 364 or 45% to an advanced

Table 4.4

Entry Level Test Performance and Level of Academic Assignment
(693 Student NJCBSPT Test Takers Entering Gloucester County College,
New Jersey in Fall 1988)

Test Performance	Academic Level Assigned								Differences
	Regular		Develp-1		Develp-2		Remedial		
	#	%	#	%	#	%	#	%	
READING									
Passed	184	47.3	199	51.2	0	0	6	1.5	$X^2_{(3)} = 259.2$ $p < 0.001$
Failed	12	3.9	165	54.3	77	25.3	50	16.4	
ENG. COMP.									
Passed	183	61.2	111	37.1	0	0	5	1.7	$X^2_{(3)} = 310.4$ $p < 0.001$
Failed	13	3.3	253	64.2	77	19.5	51	12.9	
MATH. COMP									
Passed	184	55.6	137	41.4	0	0	10	3.0	$X^2_{(3)} = 272.5$ $p < 0.001$
Failed	12	3.3	227	62.7	77	21.3	46	12.7	

Source: Appendix Tables 12, 13, 14

developmental level course(s), 77 or 10.7% to an elementary developmental level course(s), and 56 or 7.8% to a sub-collegiate or remedial level course(s).

As summarized in Table 4.5, the distribution of the 718 students placed in the four levels of instruction was significantly different in three of four key personal and educational characteristics. These were: high school class rank, scholastic aptitude test taker, and financial aid. There were no significant differences in academic placement by reason of gender. See Appendix Table 15a.

Over half of the students who placed in the top quartile of their high school class were placed in regular collegiate level courses as contrasted with 16.3% of those who placed in the lowest quartile. Similarly, over 26% of those who placed in the lowest quartile of their high school class were placed in Remedial or Development II courses; by contrast only 9.7% of those who placed in the top quartile were assigned to these classes. (Appendix Table 15b).

A higher percent of those students among the 718 enrolled in Fall 1988 who had taken the SAT or similar scholastic aptitude examination before entering Gloucester County College were assigned to regular or development I level courses. (Appendix Table 15c). Those students who accepted financial aid were less likely to be assigned to

Table 4.5

Student Attributes and Level of Academic Assignment (718 Student Test Takers Entering Gloucester County College, New Jersey in Fall 1988)

Student Attribute	Level of Academic Assignment								Differences
	Regular		Devlp-1		Devlp-2		Remedial		
	#	%	#	%	#	%	#	%	
HSCLASSRANK									
1st Qrtl	22	16.3	77	57.0	24	17.8	12	8.9	$X^2_{(6)} = 58.0$ $p < 0.001$
2-3 Qrtl	86	31.6	155	57.0	24	8.8	7	2.6	
4th Qrtl	71	52.6	51	37.8	4	3.0	9	6.7	
SATTESTTAKER									
Yes	171	38.1	230	51.2	33	7.3	15	3.3	$X^2_{(3)} = 64.1$ $p < 0.001$
No	50	18.6	134	49.8	44	16.4	41	15.2	
FINANCI AID									
Yes	51	22.2	118	51.3	31	13.5	30	13.0	$X^2_{(3)} = 22.5$ $p < 0.001$
No	170	34.8	246	50.4	46	9.4	26	5.3	
GENDER									
Male	94	27.8	177	52.4	38	11.2	29	8.6	$X^2_{(3)} = 2.84$ $p = 0.4170$
Female	127	33.4	187	49.2	39	10.3	27	7.1	

Sources: Appendix Tables 15a-15d

regular or development I courses. In this regard, acceptance of financial aid may be serving as a proxy for lower socioeconomic status. (Appendix 15d).

In summary, students assigned to regular classes tend to be graduates who placed in the top quartile of their high school class, volunteered to take the SAT or equivalent test of scholastic aptitude, or did not need or accept financial aid. By contrast, those students assigned to full developmental or remedial classes tend to place in lower quartiles of their high school class and fail to volunteer for the SAT or equivalent scholastic aptitude test, but accept financial aid.

Accuracy of Academic Placement

From Table 4.4 it is clear that some students were placed in an academic level not consistent with the reported score on one or several of the entry level examinations. For examples: 12 or 3.9% of the 304 students who failed the entry level exam in Reading Comprehension were permitted to enroll in regular rather than remedial or full developmental classes. Similarly, 3.3% of those who failed an entry level test in English Composition or Mathematics Computation were admitted to regular collegiate level courses in those subjects. At the other end of the scale, 6 or 1.5% of those who passed the examination in Reading Comprehension were

assigned to a remedial section. About the same percent of those who passed the English Composition and Mathematics Computation tests were assigned to remedial sections in those subjects.

Improving Accuracy of Academic Placement

Overall, 58 or 8.3% of the 693 test takers were misclassified. Quite possibly these are recording or clerical errors that the college may wish to review. Under any circumstances, college authorities may wish also to locate the individual records of these students to see if a substantive misassignment was made.

Student Performance at Gloucester County College

After six semesters, the 718 students who entered Gloucester County College in Fall 1988 on average had completed 37.25 credits leading to program completion. Their average QCA was 1.9. In research question 3, it was asked: what factors might have influenced student performance, including factors of personal and educational characteristics, entry level test performance, and/or initial academic placement? As shown in Appendix Tables 16a-b, only gender, SAT test taker, and high school rank were significantly related to credits earned and QCA. Acceptance of financial aid was not related to either measure of student performance. Accordingly, these three

personal characteristics together with initial academic placement were entered into the NCSS v. 5.1 program for stepwise regression. Because of a high correlation between entry level pass/fail test scores and initial academic placement, only the placement variable was entered with the personal characteristics variables into the regression equation.

As reported in Table 4.6, the combination of the four variables accounted for about 15% of the variance in credits earned and over 30% of the variance in college QCA. The rank order of the variables was the same in each regression report, namely: class rank, initial placement, SAT test taker, and gender.

Current Status of Students: Spring 1991

After six semester, 196 or 27.3% of the 718 students who began their studies at Gloucester County College in Fall 1988 were graduated with a 1-1/2 year certificate or 2 year associate degree. In Table 4.7 only 14% of the incoming 718 students were still enrolled. Almost 60% of the total number of beginning students (423 or 58.9%) dropped out at some point between Fall 1988 and Spring 1991.

Table 4.6

Credit Hours Earned After Six Semesters by Gender, SAT Test Taker, High School Class Rank, and Initial Academic Placement

Stepwise Regression

Dependent Variable: Credit Hours

Independent Variables	S-Est	R2-Add	R2-Xs	t-Value	Prob
HSCCLASSRANK	0.29	0.076	0.097	6.9	<0.001
INITACADPL	0.12	0.014	0.050	3.0	<0.002
SAT TST TAK	0.11	0.012	0.043	2.7	<0.007
GENDER	0.09	0.008	0.046	2.2	0.030

R-Squared: 0.16 Root Mean Square (RMSE): 23.86

F-Ratio 16.93 p<0.001

Multiple Regression Report

Dependent Variable: Credits

Independent Variables	Parameter Estimate	t-Value (b=0)	Prob. Level	Seq. R-Sqr
Intercept	10.70	3.14	<0.002	
GENDER	4.629	2.16	0.030	0.238
SAT TST TAK	6.435	2.70	<0.007	0.055
HSCCLASSRANK	31.13	6.86	<0.001	0.145
INITPLACE	8.88	2.99	<0.003	0.159

R-Squared 0.160 F-Ratio = 24.67 p<0.001
 Adjusted R Squared 0.153

Correlations

	GENDER	SATTSTR	HSRANK	INITPL	CREDS
GENDER	1.000	0.021	0.212	0.014	0.154
SAT TST TAK	0.021	1.000	0.167	0.153	0.180
HSCCLASSRANK	0.212	0.167	1.000	0.185	0.350
INITPLACEMENT	0.014	0.153	0.185	1.000	0.195
CREDITS	0.154	0.180	0.350	0.195	1.000

Current Status and College Performance

As also shown in Table 4.7, the 423 dropouts completed on average less than 20 college credits toward graduation before dropping out. Graduates completed on average nearly 65 credit hours and the 99 "persisters" who were still enrolled in Spring 1991 an average of 45.3 hours. Differences in mean credits earned were statistically significant (Appendix Table 17).

Students differed also in the average quality points earned over completed credit hours. Those who dropped out had earned on average 1.36 QCA on a 4-point scale, or somewhat better than a "D" average. The 99 persisters had earned a "C" average (QCA 2.11) while graduates finished their studies with an average QCA of 2.8 or slightly below a "B." (See Appendix Table 18).

Student Characteristics and Current Status

As summarized in Table 4.8, dropouts, persisters, and graduates were significantly differentiated by gender (Appendix Table 19a), high school class rank (Appendix Table 19b), and college aptitude (SAT) test taker (Appendix Table 19c). In general, graduates tended to rank in the top quartile of their high school class and/or had volunteered to take an scholastic aptitude test before entering

Table 4.7

Mean Academic Performance and Current Status (718 Members of Fall 1988 Class at Gloucester County College, New Jersey)

Current Status				
Academic Performance	Dropped Out	Persisted	Graduated	Differences
Number	423	99	196	
Percent	58.9	13.8	27.3	
Mean Credit Hours Earned	19.12	43.55	64.54	F=214.73 p<0.001
Mean QCA (4-point scale)	1.26	2.11	2.84	F=67.15 p<0.001

Source Appendix Tables 17, 18

Table 4.8

Student Characteristics and Current Status (718 Members of Fall 1988 Class at Gloucester County College, New Jersey)

Student Attribute	Current Status				Total		Difference	
	DroppedOut #	%	Persisted #	%	Graduated #	%		
GENDER								
Male	229	67.8	38	11.2	71	21.0	338 100	X ² ₍₂₎ =20.73 p<0.001
Female	194	51.1	61	16.1	125	32.9	380 100	
HSCCLASSRANK								
1st Qrtl	96	72.7	20	15.2	16	12.1	132 100	X ² ₍₄₎ =39.97 p<0.001
2-3 Qrtl	133	50.2	48	18.1	84	31.7	265 100	
4th Qrtl	59	46.1	11	8.6	58	45.3	128 100	
CollApt (SAT)								
Yes	238	53.0	59	13.1	152	33.9	449 100	X ² ₍₂₎ =23.99 p<0.001
No	185	68.8	40	14.9	44	16.4	269 100	
FINANCAID								
Yes	134	58.3	33	14.3	63	27.4	230 100	X ² ₍₂₎ =0.10 p=0.950
No	289	59.2	66	13.5	133	27.3	488 100	

NJCBSPT (n=693)

Reading								
Pass	201	51.7	53	13.6	135	34.7	389 100	X ² ₍₂₎ =24.30 p<0.001
Fail	204	67.1	45	14.8	55	18.1	304 100	
Eng. Comp								
Pass	152	50.8	35	11.7	112	37.5	299 100	X ² ₍₂₎ =26.75 p<0.001
Fail	253	64.2	63	16.0	78	19.8	394 100	
Math								
Pass	177	53.5	36	10.9	118	35.6	331 100	X ² ₍₂₎ =23.12 p<0.001
Fail	228	63.0	62	17.1	72	19.9	362 100	

Source: Appendix Tables 19a-d, 20, 21, 22

Gloucester County College. By contrast, dropouts tended to rank in the lower 3/4 of their high school class and/or were less likely to have taken the SAT or equivalent test. Acceptance of financial aid (Appendix Table 19d) was not significantly related to the decision to persist in or drop out of studies at Gloucester County College during the six semester period under study. Although these differences in percent distribution are greater than would be expected by chance alone, the X^2 values are not so great as to be of unquestioned practical significance except, perhaps, for high school class rank.

Entry Level Test Performance and Current Status

For the 693 entry level test takers, passing the tests in Reading Comprehension (Appendix Table 20), English Composition (Appendix Table 21) and Mathematics Computation (Appendix Table 22) was no guarantee of college completion, as summarized in the last three rows of Table 4.8. Indeed, over half of those who passed one or more of the entry level tests dropped out of Gloucester County College during the six semester period of study. Moreover, about two thirds of those who failed the tests dropped out. However, twice the percent of those who passed than failed the entry level tests earned a certificate or degree from Gloucester County College. Notably, failure on an entry level test did not

guarantee failure to be graduated. Indeed, nearly one fifth of those who failed one or more entry level tests managed to be graduated nonetheless.

Factors Predicting Current Status

In response to research question 4, the three personal attribute variables and three entry level test results (pass/fail) that were significantly related to current status of the 693 test taking students in the univariate analyses were entered into the stepwise discriminant analysis program of NCSS to determine which, if any, of these variables best predicted membership in or differentiated among classes of dropouts, persisters, and graduates. Excluded from this analysis were the 25 transfer students who entered Gloucester County College without entry level test scores.

The variables included: gender, high school class rank, SAT test taker, and pass/fail results for Reading Comprehension, English Composition, and Mathematics Computation.

Pass/Fail scores rather than raw scores were used as potential predictors of current status. It was the college's pass/fail decision that determined the students' initial placement in regular or remedial classes, hence the length of time needed to complete a regular 1-1/2 or two

year program.

Of the six variables entered into the stepwise discriminant analysis, three were determined to be significant predictors of current status. As shown in Table 4.9, these were high school class rank, Mathematics Computation pass/fail scores, and gender. When the number of students whose actual status was compared with the predicted number of students in each category, based on the three indicated predictors, only 102 or 35.4% of 288 drop outs were correctly predicted, 26 or 33% of 79 persisters, and 116 or 73.4% of 158 graduates. Using the three predictors reduces classification error somewhat, but the 46% accuracy of prediction overall is only marginally better than chance alone. It would appear that the variables are far more useful in predicting graduates than either dropouts or persisters.

Table 4.9

Ability of Scores on Reading Comprehension, English Composition and Mathematics Computation and Gender, High School Class Rank, SAT Test Taker, and Financial Ability to Predict Current Student Status (525 Gloucester County College Test Takers Fall 1988)

Variable Selection Report

Classification Variable: Current Status

Variable	R2-Ad	F-Value	F-Prob	R2-X's
H.S.CLASSRANK	0.062	17.0	<0.001	0.1289
MATHCOMPUTATION	0.018	4.7	<0.001	0.1005
GENDER	0.013	3.4	0.033	0.0423

Overall Wilk's Lambda 0.8785

Linear Discriminant Functions

Classification Variable: Current Status

Group	Dropped Out	Persisted	Graduated
CONSTANT	-1.0722	-1.1502	-2.2925
MATHCOMPUTATION	1.7972	1.3736	2.2679
GENDER	1.8897	2.4203	2.3431
HSCCLASSRANK	.9924	.9030	2.2315

Classification Matrix

Classification Variable: Current Status
 Independent Variables HSClassRank MathComputation
 Gender

Predicted Status

Actual Status	Drop Out	Persist	Graduate	Number
Drop Out	102	69	117	288
Persist	23	26	30	79
Graduate	19	23	116	158
Number	144	118	263	525

Percent accuracy of predictions = $\frac{102+26+116}{525} = 46.48\%$

Percent reduction in classification error due to X's: 19.7%

Chapter 5

Summary, Discussion, and Future Considerations

In the decade of the 70's accountability became a national educational byword. In its wake, the minimum competency testing program was born. As with any other public policy in higher education there were immediate proponents and opponents, but minimum competency testing, also called basic skills testing, became a concrete entity for federal and state legislators to advocate as accountability to concerned citizens who had begun to question the efficacy of the American educational system (Wise, 1978).

In response to the movement, the New Jersey Board of Higher Education in 1978 mandated that every incoming full time student in a public institution in the state of New Jersey, after admission, and prior to registration in college level classes, be tested for proficiency in the basic skills. Part-time students are permitted to take 12 college credits prior to taking the basic skills test. The purposes for such testing (the New Jersey College Basic Skills Placement Test NJCBSPT) were twofold: 1. To aid colleges in placing students in appropriate courses during their freshman year of college, and 2. to delineate the statewide status of basic skills preparation of entering

freshmen students in reading, writing, computation, and elementary algebra (New Jersey College Basic Skills Report 1989, p. 12). Additionally in 1988, the New Jersey Board of Higher Education mandated an additional two-fold focus for state institutions of higher education that called for increased minority involvement and the improvement of undergraduate education (New Jersey Board of Higher Education Memorandum to Administration).

An eleven year longitudinal study of the NJCBSPT (1978-1988) noted four consistencies in results reported to be "striking", namely: there were large proportions of underprepared students entering New Jersey colleges, and the test results and demographic variables in the student population were stable from year to year (Basic Skills Report, 1989, p. iv).

This study was undertaken at and fully supported by Gloucester County College to address four principal research questions, namely:

1. Which personal attributes and high school performance variables, individually or in combination, best accounted for the differences in scores on the entry level examinations?

Addressed in this question are the personal attributes of the 718 full time students entering Gloucester County College in the Fall of 1988; the types of high

schools from which they were graduated; how well they performed in high school; which students accepted some form of financial aid on admission to Gloucester County College.

2. How consistent were the initial academic placements with students' scores on entry level examinations?

3. Which variables (personal attributes, high school performance, entry level test scores, and academic placement) individually and in combination, best predicted or accounted for differences in their subsequent college academic performance over six semesters (i.e. degree credits earned; grade point average?

4. Which variables (personal attributes, high school performance, entry level test scores, academic assignment to developmental, remedial, or college level courses) individually or in combination best predicted or accounted for the differences in their persistence or level of academic attainment after six semesters? Specifically, what were the apparent effects, if any, of their initial academic assignment to full time study in remedial and developmental courses on the status of "high risk" students' academic progress by Spring 1991?

In pursuing the four questions indicated above, particular attention was given to the adequacy of the several data sources for the specific variables selected for study. What additional variables were available but not in

a form or condition suitable for analysis? What potentially useful variables from the literature might be added to those currently available to New Jersey community colleges for use in their data bases?

Six personal characteristics of entering students were selected from among 14 variables identified in the literature as relevant to this study. They included: gender, rank in high school class, whether or not student took the SAT or equivalent standardized test while in high school, acceptance of financial aid, and socioeconomic status of high school location. Age, race and type of high school were deemed to be relevant to this study, but were eliminated from substantive analysis for lack of variability. The Fall 1988 cohort was principally white, less than 23 years of age, and graduates of a New Jersey public high school.

Data for the study were collected primarily from the New Jersey State Departments of Education, Higher Education and the Information System and Student Personnel Departments at Gloucester County College with administrative approval after a statement of confidentiality was signed.

Summary

Personal and Education Characteristics

The personal characteristics of the class entering Gloucester County College, New Jersey in Fall 1988 were reflective of most two year college freshmen nationwide, i.e. most students were recent high school graduates, a majority were women, and the large majority were white. High school characteristics included a great majority of students from New Jersey public and private high schools most of which were small and located in lower socioeconomic areas. Most students were not academically gifted; their scores on standardized academic aptitude tests were below national norms. Most ranked in the middle 2nd and 3rd quartiles of their high school classes, with a minimum of math and science course credits on their transcripts. Many of the students had a pattern of high school absence and lateness. About one third accepted financial aid. This class profile appears to resemble that of "high risk" populations entering public community colleges and studied extensively by Astin, Green and Korn (1987), Tinto (1975), Pascarella, et al. (1983, 1985), and Zwerling (1988).

Statistical Analyses and Identification of Predictor Variables

Multiple regression analysis was used to account for differences in individual test scores on three major entry level tests, namely: Reading Comprehension, English Composition, and Mathematics Computation. There were 693 students who took the NJCBSPT. Twenty five additional students were exempted due to transfer.

There were four variables significantly related to students' scores on one or more of the entry level tests of the class of 1988 at Gloucester County College. These were gender, high school class rank, SAT test taker (or equivalent scholastic aptitude test), and socioeconomic status as measured by acceptance of financial aid. These were entered into a regression equation to determine which, if any, might predict student scores on each of the entry level examinations. High school class rank and SAT test taking were found to contribute to test scores from all three examinations. Gender was a minor factor in pass/fail differences in English Composition but not reading or mathematics.

The entry level test scores were used exclusively to place students into initial instructional levels at Gloucester County College. The study next addressed the consistency of initial academic placement and student

NJCBSPT scores, with the following results: students placed into regular college classes and the first developmental level tended to rank in the highest quartile of their high school class to have taken a standardized scholastic aptitude test, and/or not to have accepted financial aid. The study revealed a relatively small number of misclassified students.

The current status of students was examined in the Spring of 1991, six semesters after entering Gloucester County College. Of the 718 original students, 196 (27.3%) graduated; 99 (18.8%) students still were attending, and 423 (59%) had dropped out.

Dropouts had an average QCA of "D"; persisters an average of "C", and graduates close to a "B" average. Dropouts tended to be in the lower 3/4 of their high school class, and/or not to have taken a scholastic aptitude test. Financial aid was not a significant factor in the decision to drop out or persist in studies at Gloucester County College during the six semester period under study. This isn't to say that financially needy students from low income areas did not attend Gloucester County College; rather the dropout rate is so high and so pervasive among all classes of community college students at Gloucester County College as to invalidate this measure of socioeconomic status as a dropout predictor.

The effect of initial academic assignment on ultimate student status was also examined. Graduates and persisters typically were placed initially into regular classes or in developmental level 1 classes, while students in developmental level II or remedial sections were more likely to drop out. It is notable, however, that some students from the pre-collegiate level sections were graduated, and many students who were placed initially into regular sections dropped out.

In summary, high school rank and SAT test taking and financial aid were significant factors in predicting entry level test scores at Gloucester County College, and in all subsequent steps of students' passage from initial placement, academic progress, to and including current status, in both univariate and multivariate analyses. Although gender differences were noted in English Composition, credits earned, college QCA, and current status, observed differences were of little practical importance.

Initial placement clearly influenced all subsequent student progress, including credits earned, QCA, and current academic status. Initial placement, however, did not preclude a handful of remedial students from graduating in six semesters, or a greater number to continue in good standing. But the large majority of remedial development-II

students were most likely to drop out before completing one semester of degree bearing credit.

Conclusions

Gloucester County College exhibits a typical student profile with other community colleges nationwide as reported by Astin (1978), Tinto (1975), and others. The findings of this study were consistent with other studies in that students' high school grade point average and/or class rank and SAT test taking were potentially important factors in predicting success in college (Anderson, 1987; Astin, 1976; Pascarella, 1983). However, initial placement of low scoring students into sub-collegiate courses seemed to have an inhibiting effect on college persistence, at least in the six semester period under study. So few students assigned initially to sub-collegiate courses persisted as to bring into question Alpert, Gorth, and Allen's (1989) earlier endorsement of remedial studies as a boon to college persistence. Results were more in line with Losak (1987), Lavin (1965), Roueche (1967), Karabel (1986) and Zwerling's (1986) essentially negative view of remedial studies.

Alpert, Gort and Allan (1989) reported that 55% of state college students were enrolled in the fourth semester, compared with 51% of nonremedial students. They add that students needing basic skills programs and completing them have a far better chance of college persistence than those

not completing remediation. Astin (1985), Corcoran (1981), Garcia-Passalacqua (1968), and Losak and Morris (1985) also found that successful completion of remedial classes led to persistence. Other researchers do not agree with placement into remedial programs which automatically increases a student's time in college (Lavin, 1965; Losak, 1987). Some researchers (Karable, 1986; Roueche 1967), found remedial classes can lead to "custodial care" and "social stratification" by tracking into remedial classes, in particular, and the community college educational system in general. Losak (1972) found students did as well if admitted directly to regular college classes. The results of this study also indicate a general lack of effectiveness in basic skills remediation since students graduate or drop out in great numbers whether admitted to regular or remedial classes. Recently, Zwerling (1988), a noted critic of the community college system, was quoted in an article about Miami-Dade Community College, voted the number one community college in the nation, saying, "It is difficult to escape the impression that taking a remedial course for which one is eligible during the first term increases the probability of nonsuccess" (pp. 10, 13).

Future Considerations

With 59% of the original 718 students in the Class of Fall 1988 at Gloucester County College dropping out and only 27.3% completing a certificate or associate degree after six semester, it is important that variables over and beyond those employed here be considered in predicting both initial placement and ultimate success of students in the community college. To do so will require cooperation of the New Jersey State Department of Education as well as Gloucester County College.

Recommendations

Several potentially useful data from high school transcripts are unusable because of a wide divergence in local school district records. These included: high school QCA, days tardy and absent, size of graduating class, type of curriculum undertaken, credits earned in basic skills courses, etc. A uniform statewide transcript could be developed and used by all high schools so that information would have the same connotation and consistency in the written communication between high schools and colleges. If abbreviations are to be used on transcripts, they should be standardized. More attention must be focused on organization and completion of high school transcripts prior to college

admission. Transcripts should be legible, and reproduced on quality paper.

It also should be questioned why New Jersey needs both the High School Proficiency Test and the New Jersey College Basic Skills Placement Test. If the High School Proficiency Test that each student must pass before graduating could have incorporated basic skills in the test, remediation might be undertaken before entering college.

This study supports a research base indicating that student persistence in college is not clearly enhanced by placement in the college's remedial program. Further research is needed to identify additional variables related to persistence than those used in this study. These relate specifically to the students' purposes for pursuing college work, the nature and extent of outside employment while attending college, and the time spent in commuting, among others. If the State of New Jersey continues to mandate that colleges use the New Jersey College Basic Skills Placement Test, the College should unite with other state institutions in addressing the need for mandatory placement into the four areas. In this study, performance was not materially different between those placed in regular and developmental I classes and between those placed in remedial and development II classes.

Based on current data, Gloucester County College students score highest in Reading Comprehension. The state recommends that the score for reading be combined with the scores in English Composition to form a Total English composite score. Based on this study, this would mask potentially significant gender differences between competence in reading and English Composition.

In addition, the New Jersey Department of Higher Education permits institutions to score their own tests. At Gloucester County College, objective questions are scored by computer but the essay question is scored by two communications faculty independently of each other. The same two instructors score the entire testing session, but two different instructors may score different testing sessions. Accordingly, both Essay scores may be unreliable both within and across test sessions. When Essay scores are combined with Sentence Sense scores to produce a combined English Composition score, the composite score itself may be unreliable. To further combine English composite with reading scores would simply exacerbate the problem of test reliability. Accordingly, before proceeding further with local test practices or adopting the state's proposed new test scoring procedure in English, Gloucester County College should establish an objective procedure for testing the

reliability of each test and subtest at each test administration.

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Appendices

Appendix Table 4

Socioeconomic Status of High School and Gender: 539
Graduates of Public High Schools Entering Gloucester
County College New Jersey, Fall 1988 (In Number and
Percent)

SES Area of High School	Gender		Total
	Male	Female	
Low SES (5 Lowest)	186 71.8	237 84.6	423 78.5
High SES (5 Highest)	73 28.2	43 15.4	116 21.5
Total	259 100.0	280 100.0	539 100.0

Source: Appendix Table 4a $\chi^2_{(1)} = 13.1093$ $p < 0.001$

Appendix Table 5

High School Class Rank and Gender (In Number and Percent)

Class Rank	Gender	
	Male	Female
Not reported	86	90
Lowest Quartile	84 33.3	51 17.6
Middle 2nd and 3rd Quar.	122 48.4	150 51.7
Highest Quartile	46 18.3	89 30.7
Total	252 100.0	290 100.0

$$X^2_{(2)} = 22.0897 \quad p < 0.001$$

$$\text{Cramer's } V = .20$$

Appendix Table 6

Scholastic Aptitude Test Taker and Gender (In Number and Percent)

	Gender	
	Male	Female
Took the SAT, PSAT or ACT	201 44.8	248 55.2
Did not take the SAT, PSAT or ACT	137 50.9	132 49.1
Total	338 47.1	380 52.9

$\chi^2_{(1)} = 2.5647$ $p = 0.1093$

Appendix Table 7a

Acceptance of Financial Aid and Gender (In Number and Percent)

	Gender	
	Male	Female
Accepted Financial Aid	74 21.9	156 41.1
Did not accept Financial Aid	264 78.1	224 58.9
Total	338 100.0	380 100.0

$\chi^2_{(1)} = 30.1598$ $p < 0.001$

Appendix Table 7b

Acceptance of Financial Aid and Scholastic Aptitude Test Taker
(In Number and Percent)

	College Aptitude Test Taker SAT, PSAT or ACT	
	Yes	No
Accepted Financial Aid	113 25.2	117 43.5
Did not accept Financial Aid	336 74.8	152 56.5
Total	449 100.0	269 100.0

$$X^2_{(1)} = 25.9523 \quad p < 0.001$$

Appendix Table 7c

Acceptance of Financial Aid and High School Class Rank

	Lowest Quartile	Middle 2nd/3rd Quartile	Highest Quartile	Rank not Recorded
Accepted Financial Aid	38 28.1	70 25.7	47 34.8	75
Did not accept Financial Aid	97 71.9	202 74.3	88 65.2	101
Total	135 100.0	272 100.0	135 100.0	176

$$X^2_{(2)} = 3.6602 \quad p=0.1604$$

Appendix Table 8a

Reading Comprehension and Gender

	Gender	
	Male	Female
Passed Reading Test	177 54.8	212 57.3
Failed Reading Test	146 45.2	158 42.7
Total	323 100.0	370 100.0

$$X^2_{(1)} = 0.4372 \quad p=0.5085$$

Appendix Table 8b

Reading Comprehension and High School Class Rank

	Lowest Quartile	Class Rank Middle 2nd/ 3rd Quartile	Highest Quartile	Not Reported
Passed Reading Test	56 42.4	163 61.5	92 71.9	78
Failed Reading Test	76 57.6	102 38.5	36 28.1	90
Total	132 100.0	265 100.0	128 100.0	168

$$X^2_{(2)} = 24.4858$$

$$p < 0.001$$

Appendix Table 8c

Reading Comprehension and Scholastic Aptitude Test Taker

	College Aptitude Test Taker SAT, PSAT or ACT	
	Yes	No
Passed Reading Test	273 63.3	116 44.3
Failed Reading Test	158 36.7	146 55.7
Total	431 100.0	262 100.0

$\chi^2_{(1)} = 24.0558 \quad p < 0.001$

Appendix Table 8d

Reading Comprehension and Acceptance of Financial Aid

	Financial Aid	
	Accepted	Notn Accepted
Passed Reading Test	112 48.7	277 59.8
Failed Reading Test	118 51.3	186 40.2
Total	230 100.0	463 100.0

$X^2_{(1)} = 7.7327$ $p < 0.010$

Appendix Table 8e

Reading Comprehension and High School Socioeconomic Status

	High School Socioeconomic Status	
	Low SES (5 Lowest)	High SES (5 Highest)
Passed Reading Test	233 55.1	65 56.0
Failed Reading Test	177 41.8	46 39.7
No Reading Test	13 3.1	5 4.3
Total	423 100.0	116 100.0

$$X^2_{(2)} = 0.5375 \quad p=0.7643$$

At least one cell had an expected value less than 5.

Appendix Table 9a

English Composition and Gender

	Gender	
	Male	Female
Passed Composition Test	106 32.8	193 52.2
Failed Reading Test	217 67.2	177 47.8
Total	323 100.0	370 100.0

$\chi^2_{(1)} = 26.3087$ $p < 0.001$

Appendix Table 9b

English Composition and High School Class Rank

	Lowest Quartile	High School Class Rank Middle 2nd/ 3rd Quartile	Highest Quartile	Not Reported
Passed Composition Test	35 26.5	129 48.7	79 61.7	56
Failed Composition Test	97 73.5	136 51.3	49 38.3	112
Total	132 100.0	265 100.0	128 100.0	168

$X^2_{(2)} = 33.6258$ $p < 0.001$

Appendix Table 9c

English Composition and Scholastic Aptitude Test Taker

	College Aptitude Test Taker SAT, PSAT, ACT	
	Yes	No
Passed Composition Test	224 52.0	75 28.6
Failed Composition Test	207 48.0	187 71.4
Total	431 100.0	262 100.0

$$\chi^2_{(1)} = 36.2057 \quad p < 0.001$$

Appendix 9d

English Composition and Acceptance of Financial Aid

	Financial Aid	
	Accepted	Not Accepted
Passed	87	212
Composition Test	37.8	45.8
Failed	143	251
Composition Test	62.2	54.2
Total	230	463
	100.0	100.0

$$\chi^2_{(1)} = 3.9714$$

$$p=0.0463$$

Appendix Table 9e

English Composition and High School Socioeconomic Status

	High School Socioeconomic Status	
	Low SES (5 Lowest)	High SES (5 Highest)
Passed Composition Test	184 43.5	48 41.4
Failed Composition Test	226 53.4	63 54.3
No Composition Test	13 3.1	5 4.3
Total	423 100.0	116 100.0

$\chi^2_{(2)} = 0.5254$ $p=0.7690$

Appendix Table 10a

Mathematics Computation and Gender

	Gender	
	Male	Female
Passed Mathematics Test	160 49.5	171 46.2
Failed Mathematics Test	163 50.5	199 53.8
Total	323 100.0	370 100.0

$$\chi^2_{(1)} = 0.7616 \quad p=0.3828$$

Appendix Table 10b

Mathematics Computation and High School Class Rank

	Lowest Quartile	High School Class Rank Middle 2nd/ 3rd Quartile	Highest Quartile	Not Reported
Passed Mathematics Test	38 28.8	135 50.9	93 72.7	65
Failed Mathematics Test	94 71.2	130 49.1	35 27.3	103
Total	132 100.0	265 100.0	128 100.0	168

$$X^2_{(2)} = 50.0487 \quad p < 0.001$$

Appendix Table 10c

Mathematics Computation and Scholastic Aptitude Test Taker

	College Aptitude Test Taker SAT, PSAT, ACT	
	Yes	No
Passed Mathematics Test	243 56.4	88 33.6
Failed Mathematics Test	188 43.6	174 66.4
Total	431 100.0	262 100.0
$\chi^2_{(1)} = 33.9287$		$p < 0.001$

Appendix Table 10d

Mathematics Computation and Acceptance of Financial Aid

	Financial Aid	
	Accepted	Not Accepted
Passed Mathematics Test	97 42.2	234 50.5
Failed Mathematics Test	133 57.8	229 49.5
Total	230 100.0	463 100.0

$$\chi^2_{(1)} = 4.3107 \quad p = 0.0379$$

Appendix Table 10e

Mathematics Computation and High School Socioeconomic Status

	High School Socioeconomic Status	
	Low SES	High SES
Passed Mathematics Test	198 46.8	59 50.9
Failed Mathematics Test	212 50.1	52 44.8
No Mathematics Test	13 3.1	5 4.3
Total	423 100.0	116 100.0

$$X^2_{(2)} = 1.2511$$

$$p=0.5350$$

At least one cell had an expected value less than 5.

Appendix Table 11a

Reading Comprehension and Gender, High School Class Rank,
SAT Test Taker, and Financial Aid Acceptor 525 of 693
NJCBSPT Students entering Gloucester County College, Fall
1988

Reading Comprehension				
Personal Char	Num	Mean	F-Ratio	Prob
HSLRANK				
Low Qtl 1	132	155.62		
Mid Qtl 2,3	265	161.17		
HighQtl 4	128	164.30	19.53	<0.001
SATTESTAKR				
No	262	155.66		
Yes	431	162.10	46.32	<0.001
FinAid				
No	463	160.75		
Yes	230	157.47	10.86	<0.001
GENDER				
Male	323	158.84		
Female	370	160.38	2.67	0.10

Appendix Table 11b

English Composition and Gender, High School Class Rank,
SAT Test Taker, and Financial Aid Acceptor 525 of 693
NJCBSPT Students entering Gloucester County College, Fall
1988

English Composition				
Personal Char	Num	Mean	F-Ratio	Prob
GENDER				
Male	323	159.79		
Female	370	163.28	26.43	<0.001
HSCLRANK				
Low Qtl 1	132	159.02		
Mid Qtl 2,3	265	163.22		
HighQtl 4	128	165.60	25.33	<0.001
SATTESTAKR				
No	262	158.03		
Yes	431	163.85	74.21	<0.001
FinAid				
No	463	162.38		
Yes	230	160.19	9.03	<0.003

Appendix Table 11c

Mathematics Computation and Gender, High School Class Rank,
SAT Test Taker, and Financial Aid Acceptor 525 of 693
NJCBSPT Students entering Gloucester County College, Fall
1988

Mathematics Computation				
Personal Char	Num	Mean	F-Ratio	Prob
GENDER				
Male	323	164.11		
Female	370	163.47	0.79	0.037
HSLRANK				
Low Qtl 1	132	159.73		
Mid Qtl 2,3	265	164.94		
HighQtl 4	128	168.75	37.67	<0.001
SATTESTTAKR				
No	262	160.31		
Yes	431	165.87	61.07	<0.001
FinAid				
No	463	164.68		
Yes	230	161.92	13.37	<0.001

Appendix Table 12

Level of Academic Placement and Performance on Reading Comprehension Test: 718 Members of Fall 1988 Class at Gloucester County College (In Number and Percent)

Academic Placement Level	Reading Fail	Composition Pass
(0) Regular Classes	12	184
(1) Develop.Lev. 1	3.9	47.3
(2) Develop.Lev. 2	165	199
(3) Remedial Level	54.3	51.2
	77	0
	25.3	0.0
	50	6
	16.4	1.5
Total	304	389
	43.9	56.1
	100.0	100.0

$$X^2_{(3)} = 259.1592 \quad p < 0.001$$

Appendix Table 13

Level of Academic Placement Performance on English
Composition Test: 718 Members of Fall 1988 Class at
Gloucester County College (In Number and Percent)

Academic Placement Level	English Composition	
	Fail	Pass
(0) Regular Classes	13	183
	3.3	61.2
(1) Develop.Lev. 1	253	111
	64.2	37.1
(2) Develop.Lev. 2	77	0
	19.5	0.0
(3) Remedial Level	51	5
	12.9	1.7
Total	394	299
	56.9	43.1
	100.0	100.0

$$X^2_{(3)} = 310.4411 \quad p < 0.001$$

Appendix Table 14

Level of Academic Placement and Mathematics Computation
Test: 718 Members of Fall 1988 Class at Gloucester County
College, New Jersey (In Number and Percent)

Academic Placement Level	Mathematics Computation	
	Fail	Pass
(0) Regular Classes	12 3.3	184 55.6
(1) Develop.Lev. 1	227 62.7	137 41.4
(2) Develop.Lev. 2	77 21.3	0 0.0
(3) Remedial Level	46 12.7	10 3
Total	362 52.2 100.0	331 47.8 100.0

$\chi^2_{(3)} = 272.4929$

$p < 0.001$

Appendix Table 15a

Level of Academic Placement and Gender: 718 Members of
Fall 1988 Class at Gloucester County College, New Jersey
(In Number and Percent)

Academic Placement	Gender	
	Male	Female
Regular College Classes	94 27.8	127 33.4
Developmental Level I	177 52.4	187 49.2
Developmental Level II	38 11.2	39 10.3
Remedial Level	29 8.6	27 7.1
Total	338 100.0	380 100.0

$$X^2_{(3)} = 2.8396$$

$$p=0.4170$$

Appendix Table 15b

Level of Academic Placement and Rank in High School Class:
718 Members of Fall 1988 Class at Gloucester County College
(In Number and Percent)

	Class Rank			Not Reported
	Lowest Quartile	Middle 2nd/3rd Quartile	Highest Quartile	
Academic Placement				
Regular College Classes	22 16.3	86 31.6	71 52.6	42
Developmental Level I	77 57.0	155 57.0	51 37.8	81
Developmental Level II	24 17.8	24 8.8	4 3.0	25
Remedial Level	12 8.9	7 2.6	9 6.7	28
Total	135 100.0	272 100.0	135 100.0	176

$$X^2_{(6)} = 57.9582$$

$$p < 0.001$$

Appendix Table 15c

Level of Academic Placement and Scholastic Aptitude Test Taker:
718 Members of Fall 1988 Class at Gloucester County College,
New Jersey (In Number and Percent)

	College Aptitude Test Taker	
	Yes	No
Academic Placement		
Regular College Classes	171 38.1	50 18.6
Developmental Level I	230 51.2	134 49.8
Developmental Level II	33 7.3	44 16.4
Remedial Level	15 3.3	41 15.2
Total	449 100.0	269 100.0

$$X^2_{(3)} = 64.1146 \quad p < 0.001$$

Appendix Table 15d

Level of Academic Placement and Financial Aid: 718 Members
of Fall 1988 Class at Gloucester County College, New Jersey
(In Number and Percent)

Academic Placement	Financial Aid	
	Accepted	Not Accepted
Regular College Classes	51 22.2	170 34.8
Developmental Level I	118 51.3	246 50.4
Developmental Level II	31 13.5	46 9.4
Remedial Level	30 13.0	26 5.3
Total	230 100.0	488 100.0

$$X^2_{(3)} = 22.4924$$

$$p < 0.001$$

Appendix Table 16a

Credit Hours Earned After Six Semesters by Gender, SAT Test Taker, Class Rank, and Financial Aid: 693 Test Takers at Gloucester County College New Jersey: Spring 1991

College Credits Earned

	Number	Mean	S.D.	F-Ratio	Prob.
GENDER					
Male	323	32.86	1.45		
Female	370	41.64	1.35	19.71	<0.001
SATTESTAKR					
No	262	28.96	1.57		
Yes	431	42.77	1.23	47.86	<0.001
HSCLASSRANK					
Low QTL 1	132	26.05	2.13		
Mid QTL 2-3	265	43.03	1.50		
HighQTL 4	128	49.60	2.16	33.32	<0.001
FINANCAID					
No	463	37.75	1.22		
Yes	230	37.16	1.74	0.08	0.78

Appendix Table 16b

COLLEGE PERFORMANCE (QCA) After Six Semesters by Gender, SAT Test Taker, Class Rank, and Financial Aid: 693 Test Takers at Gloucester County College New Jersey: Spring 1991

College Performance QCA					
	Number	Mean	S.D.	F-Ratio	Prob.
GENDER					
Male	323	1.68	.0061		
Female	370	2.11	.0057	26.74	<0.001
SATTESTTAKR					
No	262	1.553	.0067		
Yes	431	2.127	.0053	45.12	<0.001
HSCCLASSRANK					
Low QTL 1	132	1.26	.0084		
Mid QTL 2-3	265	2.06	.0060		
HighQTL 4	128	2.57	.0086	61.04	<0.001
FINANCAID					
No	463	1.93	.0052		
Yes	230	1.88	.0742	0.29	0.593

Appendix Table 17

Credit Hours Completed and Current Status 693 NJCBSPT Takers
Entering Gloucester County College, New Jersey, Fall 1988

College Performance	Current Status		
	Drop Out	Persister	Graduate
Number	405	98	190
Percent	58.4	14.1	27.4
Credit Hours Completed	21.11	48.10	67.14
	F = 512.73	p < 0.001	

Appendix Table 18

College Performance (QCA) and Current Status 693 NJCBSPT Takers
Entering Gloucester County College, New Jersey, Fall 1988

College Performance	Current Status		
	Drop Out	Persister	Graduate
Number	405	98	190
Percent	58.4	14.1	27.4
QCA	1.39	2.21	2.87
		F = 176.29	p < 0.001

Appendix Table 19a

Student Current Status by Gender (In Number and Percent)

	Male	Gender	Female
Current Status			
Drop Out	229 67.8		194 51.1
Persister	38 11.2		61 16.1
Graduate	71 21.0		125 32.9
Total	338 100.0		380 100.0

$\chi^2_{(2)} = 20.7311$

$p < 0.001$

Appendix Table 19b

Student Current Status by High School Class Rank
(In Number and Percent)

Current Status	High School Class Rank			
	Lowest Quartile	Middle 2nd/ 3rd Quartile	Highest Quartile	Not Reported
Drop Out	96 72.7	133 50.2	59 46.1	117
Persister	20 15.2	48 18.1	11 8.6	19
Graduate	16 12.1	84 31.7	58 45.3	32
Total	132 100.0	265 100.0	128 100.0	168 100.0

$X^2_{(4)} = 39.9730$ $p < 0.001$

Appendix Table 19c

Student Current Status by Scholastic Aptitude Test Taker
(In Number and Percent)

	Scholastic Aptitude Test Taker	
	Yes	No
Current Status		
Drop Out	238 53.0	185 68.8
Persister	59 13.1	40 14.9
Graduate	152 33.9	44 16.4
Total	449 100.0	269 100.0

$X^2_{(2)} = 26.3266$

$p < 0.001$

Appendix Table 19d

Student Current Status by Financial Aid Accepted/Not Accepted
(In Number and Percent)

Current Status	Financial Aid	
	Accepted	Not Accepted
Drop Out	134 58.3	289 59.2
Persister	33 14.3	66 13.5
Graduate	63 27.4	133 27.3
Total	230 100.0	488 100.0

$$X^2_{(2)} = 0.1024$$

$$p = 0.9501$$

Appendix Table 20

Student Current Status by Performance on New Jersey College
Basic Skills Placement Test of Reading Comprehension
(In Number and Percent)

Current Status	Reading Comprehension Test	
	Pass	Fail
Drop Out	201 51.7	204 67.1
Persister	53 13.6	45 14.8
Graduate	135 34.7	55 18.1
Total	389 100.0	304 100.0

$$\chi^2_{(2)} = 24.2994$$

$$p < 0.001$$

Appendix Table 21

Student Current Status by Performance on New Jersey College
Basic Skills Placement Test of English Composition (In
Number and Percent)

Current Status	English Composition	
	Pass	Fail
Drop Out	152 50.8	253 64.2
Persister	35 11.7	63 16.0
Graduate	112 37.5	78 19.8
Total	299 100.0	394 100.0

$$X^2_{(2)} = 26.7515$$

$$p < 0.001$$

Appendix Table 22

Student Current Status by New Jersey College
Basic Skills Placement Test of Mathematics Computation

Current Status	Mathematics Computation	
	Pass	Fail
Drop Out	177 53.5	228 63.0
Persister	36 10.9	62 17.1
Graduate	118 35.6	72 19.9
Total	331 100.0	362 100.0

$$X^2_{(2)} = 23.1166$$

$$p < 0.001$$

Vita

Geraldine Ella Savidge Martin was born on July 24, 1935 in Camden, New Jersey.

Daughter of Florence L. and M. Leonard Savidge
Sister of Lenora (Lee) Savich and L. Theodore Savidge
Wife of Richard Searles Martin, Sr. June 21, 1958
Mother of Richard (Rick) Searles Martin, Jr. nee 6-18-63 and
Lenora (Lori) Florence Martin Tetzner nee 7-15-65

Graduated from:

Woodbury High School, Woodbury, New Jersey 1953
Jefferson Medical College Hospital School of Nursing
1956 (now Thomas Jefferson University)
University of Pennsylvania 1964 B.S. Nursing
Glassboro State College 1975 M.A. Education
(now Rowan College)
Virginia Polytechnic Institute of Technology and State
University, Doctorate in Higher Education
Administration with cognate in Family Therapy
Attended the American Academy of Dramatic Art in
New York City. Studied the piano extensively and
specializes in piano performance. Apprentice with
Philadelphia all Girl Piano Symphony Orchestra 1951.
Church organist.

Licenses Held: Registered Nurse, New Jersey and
Pennsylvania

Certifications Held: School Nursing
Early Childhood Education
Elementary Education
Parent Effectiveness Trainer

Positions Held: Nursing: Medical/Surgical Nurse
Labor and Delivery Room Nurse
Emergency Room Nurse
School Nurse
Instructor I Medical/Surgical
Nursing

Teaching: Kindergarten
Founder, co-owner with husband,
director Martin (Pre) School
1969-1987

Instructor I to Full Professor

Child/Human Development 1974-
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Berudine S. Savage
