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A STUDY OF THE EFFECTIVENESS OF SELECTED ASPECTS
OF THE DEVELOPMENTAL EDUCATION PROGRAM
AT AN URBAN MULTICAMPUS COMMUNITY COLLEGE

by


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A Dissertation Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of


DOCTOR OF PHILOSOPHY
URBAN SERVICES

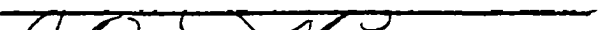
OLD DOMINION UNIVERSITY
May, 1983

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ABSTRACT

A STUDY OF THE EFFECTIVENESS OF SELECTED ASPECTS
OF THE DEVELOPMENTAL EDUCATION PROGRAM
AT AN URBAN MULTICAMPUS COMMUNITY COLLEGE

Michael Anthony Barton
Old Dominion University, 1983
Director: Dr. Maurice R. Berube

The purpose of this study was to examine the effectiveness of developmental/remedial education at an urban multi-campus community college. The study sought (1) to identify the number and demographic characteristics of students served by developmental studies, (2) to determine the academic achievement and persistence of these students, and (3) to assess the performance of developmental English students in regular college English.

Data were obtained for a two year period on all new students who enrolled in the fall of 1980. The study employed two approaches: (1) a descriptive analysis of the variables of age, sex, race, enrollment status and day/night attendance; (2) a static group comparison to detect differences in performance in college English, in cumulative grade point average, in credits completed and in the number of quarters attended between developmental and other students.

The descriptive analysis revealed that 1) slightly more than one-fourth of new students enrolled in a developmental course; 2) developmental students were likely to be younger, male, and to attend full-time during the day; and 3) the

large majority of developmental students was white, although non-whites were overrepresented.

Full-time developmental students were found to complete as many quarters of enrollment as other full-time students and part-time developmental students completed a significantly higher number of quarters than did part-time nondevelopmental students.

Developmental students' mean GPA was significantly lower than the GPA of others. When examined by increasing intervals of credits earned, however, developmental students' GPA increased in linear fashion and eventually surpassed that of nondevelopmental students. For students enrolled in more than one developmental course this pattern was not obtained. An inverse relationship was found between the number of developmental courses and grade point average.

Students who completed a developmental English course performed less well in college English than other students, yet a substantial majority (68 percent) was able to pass the course with at least a grade of C.

Overall, the findings of this study indicate that developmental students remain in school as long as, and eventually perform as well as, other students.

DEDICATION

This is dedicated to my parents, Ace and Kay, who have nourished and encouraged me always.

ACKNOWLEDGEMENTS

I would like to thank all those persons whose help and support contributed to the success of this project. I am especially thankful for my wife, Betsy, without whose encouragement and patience, this study would not have come to fruition.

I am grateful to the members of my committee, Drs. Maurice Berube, Dwight Newell, Janis Sanchez-Hucles and Timothy Kerr, for their participation and valuable contributions to this study.

Special thanks are due to Dr. Wolfgang Pindur who offered focus and direction in the early stages of this endeavor.

I appreciate also the help and cooperation extended by the administration of Tidewater Community College, in particular, Drs. Robert Grymes and Kevin Hunt. Thanks are due as well to David Golay and the staff of the College's Office of Institutional Research for the invaluable assistance they provided in obtaining the research data.

Warm appreciation is extended to my colleagues, Arthur Smith, John Hogue, Roland Biesecker and Katreena Davenport who critiqued and supported this undertaking throughout its genesis.

I am especially grateful to Dr. Larry Jenkins who contributed much time and valuable expertise to this project and who taught me a great deal in the process.

Deep appreciation is extended to Mike McAnulty who offered invaluable assistance with methodological issues, critically reviewed numerous drafts of this paper and contributed in a large way to my learning.

Special thanks are due to Patricia Thomas and the staff of the Learning Resources Center, Tidewater Community College -- Chesapeake Campus for their cooperation and assistance in obtaining many of the materials needed in the preparation of this paper.

Finally, I would like to acknowledge the contribution of Priscilla Lutton, who typed this paper and whose competence and cheerful attitude eased considerably the demands of preparing this paper.

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I. INTRODUCTION

The adoption of an open access enrollment model in the 1960's brought dynamic changes to higher education in the United States. Although some four-year institutions experimented with and implemented this concept of expanded access to post secondary education, it was the rapidly developing community college movement that most fundamentally embraced the open door principle of welcoming "any person who is a high school graduate or who is an adult citizen..." (Monroe, 1972).

This broadened access and responses to the social and political tensions of the 1960's contributed to a dramatic increase in college enrollments. By 1971, the Carnegie Commission reported a 124 percent increase in college enrollment over the previous decade (Carnegie Commission, 1971). The proportion of high school graduates entering college increased from one-third in 1960 to more than half by the mid-seventies (Cross, 1976), and by the turn of the decade, one-third of the students entering higher education were doing so at a community college (Medsker and Tillery, 1971).

This rapid growth in enrollment has created a highly diverse student body composed of groups previously underrepresented in higher education--adults beyond the high

school age, women and persons from lower socio-economic levels (Cross, 1976). With the exception of the Jewish community in New York City, numerous ethnic groups, particularly, have found a more representative presence in this group.

There has been diversity in ability as well. Much of the increase in enrollment has come from the second and third quartiles of academic ability (Cross, 1971), and 30 to 50 percent of entering students have been found to lack the basic skills required for college study (Medsker and Tillery, 1971; Roueche and Armes, 1980).

Problem

Once accepted into the community college, students lacking requisite academic skills pose a dilemma for the institution: how to make good on its implied promise to provide a college education while maintaining standards that lead to employability upon graduation and guarantee the value of its credits to other institutions (Moore, 1970).

Community colleges have responded to this dilemma by creating developmental/remedial courses and programs (Cross, 1976) essentially designed to prepare low-achieving and underprepared students to enter regular college curricular programs. Students are admitted to the college and, after being screened according to some placement criteria, may be encouraged or required to enroll in a combination of non-credit courses in English, reading and mathematics before they are admitted to a program of study.

The major assumption reflected in remedial course programming is that the causes of low academic achievement prior to college enrollment can, in fact, be remediated (Losak, 1972). Research concerning the effectiveness of developmental/remedial education in preparing these students for college success, however, is both lacking and inconclusive (Klingelhofer and Hollander, 1973; Ragburn, 1975; Cross, 1976; Moore, 1976; Southern Region Educational Board, 1981). While some successes have been reported (Roueche, 1977; Romoser, 1978; Lavin, Alba and Silverstein, 1981), there has been too much variation in the goals, strategies and evaluation of these programs to justify generalizations about which approaches are most effective. Currently, there is wide agreement that too many remedial students withdraw from college prematurely or remain in school making little or no progress, while others advance without the necessary skills and competencies (McCabe, 1981; Cross, 1981).

Recent changes in the public mood toward increased accountability are reflected at the community college level by demands for higher standards and a questioning of the efficacy of the open door concept (McCabe, 1981). Against this background, community colleges continue to enroll increasing numbers of underprepared students. Ineffective institutional responses to their educational needs is costly to this group not only financially, but also in terms of their time invested and their often thwarted goals (Friedlander, 1981).

The Carnegie Commission on Policy Studies in Higher Education (1980), reflecting its concern about these developments, states:

...the mission of these institutions is increasingly difficult to discern. And related to that problem is the possibility that the original functions of these colleges may, in the future, be deemphasized or even disappear. The greatest problem posed by that possibility would be faced by students who need special help in overcoming educational deficiencies that were not removed during their high school years.

In summary, then, the problem is that while the apparent need for remediation among community college freshmen continues to increase, clear strategies toward an effective program response remain elusive. And all of this occurs against a background of increased public concern regarding the capacity of the community college to accomplish this fundamental aspect of its mission.

Rationale for the Study

Considering this dilemma and the dearth of conclusive research regarding the effectiveness of remedial programs, community colleges need to reexamine and evaluate their own remedial programs by conducting individual institutional research directly related to stated institutional goals (Whittle, 1980; Clowes, 1981). Such efforts were advocated more than ten years ago by Willingham (1970) who called for studies to identify ways in which institutions and students may have failed to convert access into opportunity. He also recommended evaluation of programs designed to expand

opportunities for "disadvantaged" students to improve their effectiveness.

The value of individual institutional research has also been described by Roueche and Boggs (1968):

Public institutions are "Community oriented" and typically have the word "community" in their names. They are established to solve local problems, to be responsive to community needs and concerns. The emulation of the practices and programs of other two-year institutions does not necessarily lead to local improvement. The same questions need to be raised in all two-year colleges, but the answers may vary tremendously from one institution to another.

Hill (1978) reminds us that developmental education is expensive, and he cautions that unless colleges generate the research necessary to determine the viable parts of their developmental programs, politicians may terminate them. More recently, Clowes (1981) maintains that it is imperative for the community colleges to develop their own criteria and process for the review of their programs. In his view:

The focus of state level coordination has been changing and evolving.... The initial focus was upon proposed new programs; the current focus has moved first to question the quality and appropriateness of existing programs and more recently to the viability of existing programs...In The Uses of the University Kerr identified the conflicting claims of two models in American higher education: the needs/access model epitomized by public community colleges and the quality/excellence model epitomized by flagship state universities and private research universities. As concerns for accountability and program quality begin to dominate the process of statewide coordination of public higher education, attention gravitates the interest of the quality/excellence model of higher education...so that traditional criteria for academic quality are usually applied...Community colleges particularly, need criteria and processes appropriate to their unique role...This is especially important when

community and junior colleges must interface with statewide coordinating agencies which may not be sympathetic to the philosophy of the needs/access model. It is imperative that the review process be a normal, internal activity of an academic institution attempting to reconcile its missions and activities rather than an external (and threatening) event.

For developmental education in Virginia, Clowes' observations have been apt. In 1979, the State Council for Higher Education for Virginia (SCHEV) received a request from J. Wade Gilley, Secretary of Education, to evaluate the developmental/remedial studies programs at two and four-year institutions. The report, Developmental Education in Virginia: State Council of Higher Education for Virginia, was published in January, 1981, and in terms relevant here: (1) questions "whether or not the need for remedial education should be met at the postsecondary level or remanded to the high schools", (2) finds that state institutions are undertaking more remediation without comprehensive evaluation of outcomes, (3) states that "community colleges will probably continue to carry out most of the burden of remediation for higher education", (4) emphasizes the importance of student achievement following access to college, (5) projects increased needs for remediation in the current decade, and (6) charges that "the evaluation of remedial education has been less than adequate to date." The report concludes:

...there are virtually no formal systems of evaluation which describe how or to what extent developmental education is successful at a given institution. For instance, even though individual community colleges claim to have methods of

evaluation, there is no systemwide method of evaluating different approaches against common standards.

A survey of developmental education at the Commonwealth's 39 colleges and universities was a portion of the Council's study. Analysis of the results reveals that nine of Virginia's 23 community colleges report that they have no type of evaluation activity for their developmental programs. The institution which is the subject of this study is one of those nine.

Finally, there is a critical need for developmental/remedial education in major urban areas such as the one served by the subject institution (Craig, 1975; Maryland State Board for Community Colleges, 1981). The SCHEV (1981) survey results confirm that among the Commonwealth's 39 colleges and universities, the subject institution ranks fourth in the percentage of foundation (remedial) hours as a percentage of total credit hours offered. As a beginning to an evaluation of the developmental studies program at one college, this study attempts to identify benchmarks of student achievement and to stimulate future research that will result in improved program quality.

Purpose

The purpose of this study is to examine the effectiveness of developmental/remedial education at a multicampus community college serving the highly urbanized region of southeastern Virginia. As an exploration of

program effectiveness, the study seeks to identify the number of students served by developmental studies, their demographic characteristics, their achievement in credit coursework and their persistence at the institution. Additionally, this study investigates the effectiveness of the developmental English program in preparing students for regular college English. English courses are targeted because they are intended to prepare students for a specific credit English course; whereas, in the case of mathematics and reading the subsequent benefits of remediation are much more elusive.

Specifically, the study attempts to answer these research questions:

- I. How many students who entered in the Fall Quarter 1980 were enrolled in one or more developmental studies courses?
- II. Are students who enrolled in one or more developmental courses distinguishable from other students on the basis of the variables age, sex, race, enrollment status, and day/night attendance?
- III. Is there an association between student developmental studies status and persistence at the institution?
- IV. Is there an association between developmental studies status and GPA?
- V. How do students who complete developmental English perform in college English 101/111?

The results of this study are expected to be used by college personnel in several ways: (1) to assess the value of current commitments of resources to developmental education, (2) to identify particular issues concerning developmental studies that bear additional investigation, (3) to provide information to the faculty concerning the program's effectiveness, (4) to promote faculty awareness of the desirability and availability of information concerning the effectiveness of developmental studies.

Definition of Terms

Age Students are categorized into four age groupings which are intended to broadly permit identification of the traditional college-age student (15-25 years), the young adult (26-35 years), middle-aged student (36-45 years), and the older student (46 years or more).

Developmental Studies Student A student enrolled during the Fall Quarter, 1980, who attempted at least one mathematics, reading or English course defined by the institution as developmental. Elsewhere, used interchangeably with remedial student, new student, high-risk student.

Enrollment Status Refers to whether a student is enrolled full-time or part-time. A full-time student enrolls for twelve or more course credits. Part-time students carry less than than twelve course credits.

GPA Refers to cumulative grade point average, the average obtained by dividing total grade points by the number of credits attempted.

Nondevelopmental Student Any student enrolled for credit during the Fall Quarter, 1980, not attempting a developmental course. Also, used interchangeably with other students.

Persistence The number of quarters completed during the six quarters encompassed by the study (Fall 1980 - Spring 1982).

Race Refers to whether a student is white or nonwhite. Categories of nonwhite are combined in this study because black students comprise so high a percentage of it.

Limitations

This study is an exploratory inquiry which seeks to determine bases for the subsequent investigation of causal relationships between the variables identified. The focus on an arena of natural occurrences yields a high degree of realism that requires reduced experimental control over the phenomena investigated. Thus, while the investigation will describe differences between the developmental and non-developmental groups, it cannot show the degree of impact of the developmental studies courses.

This is an ex post facto study and its findings are limited to populations comparable to those described herein. This research does not attempt to evaluate specific aspects of developmental studies program, but focuses on overall data of student achievement and persistence.

II. REVIEW OF THE LITERATURE

This chapter reviews several bodies of literature which provide the basis for consideration of the nature and effectiveness of urban community college remedial education programs. First, to place community college remedial education in its policy context, both the development of the community college and the genesis of the open access enrollment model are surveyed. Second, the literature concerning the characteristics of community college students is examined to provide a basis for understanding the features of this group. A third arena of investigation concerns the nature and effectiveness of the kinds of developmental/remedial programs that have been developed within the last twenty years. Finally, research which focuses specifically upon the variables under investigation (i.e. numbers of remedial students, age, sex, race, persistence and grades) is surveyed to provide both direction to the formulation of the research questions and clarity in subsequent interpretation of the results of this study.

Community College Overview

That all individuals should have the opportunity to progress as far as their abilities and interests permit is a concept deeply rooted in American tradition. The extension

of this concept to post secondary education is a relatively recent occurrence, however, the result of increased recognition by citizens and policy-makers of (1) the threats to freedom and social mobility inherent in a system which limits educational opportunity, (2) the need for a literate and informed citizenry, and (3) the contribution to national income of investment in education (Monroe, 1972).

The first national policy statement supporting universal opportunities for higher education was delivered by the Truman Commission on Higher Education (1946-47):

Equal educational opportunities for all persons, to the maximum of their individual abilities and without regard to economic status, race, creed, color, sex, national origin, or ancestry, is a major goal of American democracy. Only an informed, thoughtful, tolerant people can maintain and develop a free society....The democratic community cannot tolerate a society based upon education for the well-to-do alone. If college opportunities are restricted to those in the higher income brackets, the way is open to creation and perpetuation of a class society which has no place in the American way of life. (Higher Education for American Democracy, 1947)

Among its recommendations the Commission advocated the development of tuition-free community colleges, a position reiterated ten years later by Dwight D. Eisenhower's Committee on Education Beyond the High School (1955-56). That committee's report concluded:

Communities or groups of neighboring communities faced with an impending shortage of higher education capacity will do well to consider new two-year community colleges as part of the solution...Community colleges can be highly effective in affording readily available opportunities for excellent education beyond the high school. (President's Committee on Education Beyond the High School, 1957)

In 1964 the National Education Association joined other groups pressing for wider access to higher education. In a report advocating more community colleges, the NEA's Educational Policies Commission stated:

Unless opportunity for education beyond high school can be made available to all...then the promise of individual dignity and freedom cannot be extended to all....Therefore, the nation's goal of universal educational opportunities must be expanded to include at least two further years of education, open to all high school graduates and designed to move each student toward intellectual freedom. (National Education Association, 1964)

Soon thereafter, the Carnegie Commission (1970) recommended that as a matter of public policy every high school graduate or otherwise qualified person should have unrestricted access to higher education. Concerning the role of the community college, the Commission stated:

The two-year community college is an ideal mechanism for accomplishing that goal, particularly if the community college perseveres in fulfilling its unique role. That is, all community colleges should continue to provide transfer education, general education, remedial courses, occupational programs, continuing education for adults and cultural programs to enrich the community environment (Carnegie Commission on Higher Education, 1970).

This movement toward universal higher education was accompanied by major societal developments in the 1960's, a decade which saw a questioning of fundamental values, accelerating public expectations, the assumption of public responsibility for higher education and important innovations in educational research (Willingham, 1970). One result of these developments was a tremendous increase in community college enrollments, an increase largely comprised

of groups previously underrepresented in higher education. Many of these students were new to higher education and entered through open admissions policies.

This "open door" or "open access" policy has been defined by Decker, Jody and Brings (1976) as "equal access for all to higher education, even for those individuals whose previous academic performance and low socio-economic status would not ordinarily give them access to college." In other words, this policy means that anyone who is a high school graduate or who is at least eighteen years old may enroll. Medsker and Tillery (1971) estimated that at the turn of the decade, one-third of all students entering the community colleges in the United States were doing so as a result of the "open door."

Criticism of the Community College

Not surprisingly, the implementation of open door policies at community colleges has generated considerable controversy. Elitist critics charge that it results in an erosion of academic standards and threatens institutional integrity, while egalitarian proponents contend that open access serves democratic ideals by promoting social equality (Whittle, 1980). Among other critics of the community college (Jencks and Riesman, 1968; Cohen, 1977; Jencks, 1972; Bowles and Gintis, 1976), is Zwerling (1976), who maintains that community colleges are quite effective in accomplishing a hidden purpose--to defuse potential social discontent through the illusion of opportunity and upward

mobility they create. Another critic (Moore, 1970, 1976) complains of the fraudulence of encouraging underprepared students to enroll, and then permitting them to fail or drop out in a term or two. Roueche (1968) believes that the "open door" has become a "revolving door" for too many of these students partly because there is a lack of commitment to serving low-achieving students once they are admitted.

Community College Students

The rapid growth in community college enrollments has created a student body characterized primarily by its diversity. Students represent nearly all levels of academic ability, achievement, family background and motivation (Medsker and Tillery, 1971; Knoell, 1973). According to Gleazer (1973), it reflects the most diverse ability range ever encountered by an educational institution. Gleazer (1973) summarizes this diversity:

Who goes to the community college? Everybody. The mix of students is one of the challenges of community college work. There are students from educationally disadvantaged backgrounds, students in advanced placement programs, and students well beyond the traditional age groups.

Community college attempts to respond to the needs of those in this group who previously would not have been accepted (or have attempted to enroll), have resulted in the invention of numerous labels to categorize them--new, high-risk, disadvantaged, non-traditional, developmental, marginal, basic skills, remedial and others (Grant, 1978). Regardless of the labels that may be applied to them,

increasing numbers of students enroll at community colleges without the skills, attitudes and abilities required for college study (McCabe, 1981).

In 1971, Medsker and Tillery estimated that 30-50 percent of entering students were in need of some form of remediation. More recent research suggests the numbers now may be even higher. Roueche and Armes (1980) report that more than half of the students now entering community colleges read below the eighth grade level, a decline of two grade levels since 1971. In a single institution study, Rodwick (1976) found that most entering students (98% in mathematics, 70% in English, 81% in reading) did not function at the college level. Reflective of this trend are the results of a survey reported in The Chronicle of Higher Education (June 1, 1981) which describes a 22 percent increase in remedial course offerings over the previous year (17% in mathematics and 38% in basic grammar and reading).

Characteristics of Developmental/Remedial Students

According to Kraetsch (1980), in a synthesis of the related works of Roueche, Cross, Gordon, Mulka, Sherrin and Coleman, these basic skills students may be characterized by one or more of the following:

1. poor study habits
2. inadequate mastery of basic academic skills
3. low academic ability or low I.Q.
4. psychological/motivational blocks to learning
5. socio-cultural factors relating to deprived family and school background
6. lack of parental encouragement
7. minority and/or sex discrimination

8. occupational rather than academic preparation in high school
9. lack of motivation
10. poor self-image and
11. sense of powerlessness over themselves and their environment.

In a survey of 42 public community colleges, the Texas College and University System (1975) found that students in developmental compensatory programs are generally characterized by at least one of the following:

1. history of low achievement in prior educational experiences
2. learning disability
3. veteran
4. adults returning to college after a long absence from school
5. adults desiring updating of skills for job maintenance/advancement
6. economic disadvantage.

These students do not represent one sex, race or age. However, they are more likely to be men and, although minorities are over-represented in this group, the large majority is white (Cross, 1976). The average age is about thirty, and nearly all age groups are represented (Linthicum, 1979).

Community College Response to New Students

The presence of large numbers of these students has presented a dilemma for the community college. As expressed by Moore (1970) more than ten years ago:

It is confronted with maintaining standards to ensure the employability of its graduates and the unequivocal guarantee of its credits to other accredited colleges and universities. At the same time it is committed by philosophy to providing some formal education or training for all students regardless of social class, sex, race and lack of previous academic success. In either case, the

comprehensive community college has no option. It has to perform both functions.

The initial community college response to this challenge was a proliferation in the 1960's of remedial courses in the language arts and mathematics. According to Roueche and Clark (1981), the number of remedial courses and programs in higher education grew from 117 in 1965 to 761 by 1976. This increase saw a 40 percent rise in courses/programs for new students between 1971 and 1975 alone. Today more than 93 percent of community colleges are providing some kind of remedial service (Roueche and Snow, 1977).

Explosive growth in remedial programming has been accompanied by disagreement concerning where, when and how these efforts should be designed. The result has been a great deal of variation in delivery systems, grading practices, credit offered and student success rates (Hill, 1978). Currently, the most common approaches are:

1. pre-college summer programs
2. programs concurrent with regular courses during the first semester (or two)
3. holding colleges where deficiencies must be corrected prior to regular admission (Grant, 1978).

While researchers have struggled to identify, define and label students in need of remediation, so too have the institutions found themselves uncertain about what labels to apply to the programs they offer. Controversy surrounding use of "remedial," "disadvantaged," and "compensatory" has centered around ideological disagreements concerning whether

the responsibility for failure lies with the student or with the educational structure (Grant, 1978). "Developmental," the currently popular label, refers to development of the "whole" person and thus focuses on developing strengths as well as on improving weaknesses. Usually, however, this term is a euphemism for the remedial skills approach still taken at most institutions (Cross, 1976).

Regardless of the labels employed, developmental programs primarily serve students who enroll with the intention of entering and completing a college curriculum. Despite unprecedented expenditure of funds toward this goal, the evidence suggests these programs have met with limited success. Most have been poorly conceived, poorly planned, poorly implemented and almost never evaluated (Trillin, 1980; Roueche and Armes, 1981).

According to Jelfo (1974) programs have been unworkable due to:

1. questionable placement procedures
2. lack of agreement about what should be taught in the course
3. lack of suitable instructional material and confusion about proper methodology and course content
4. lack of knowledge about students' reading and writing abilities
5. lack of knowledge about students' personal problems
6. a variety of subjective grading standards
7. insufficient experimentation.

Consistent with this view, Knoell and McIntyre (1974) state that "this area often shows uneven success or the lack of measurable goals." And Moore (1976), charges that:

Much of the confusion over procedures and methodologies suitable for upgrading skills is that whether or not the community college is really able to define or cure academic deficiencies has not been confirmed with hard unequivocal evidence.

In an extensive review of the early literature (1960-1971) concerning remedial programs and students, Klingelhofer and Hollander (1973) found wide qualitative variability in the research. Much of it is testimonial rather than evidential, is preoccupied with blacks and tends to consider all new students the same. The authors conclude that "there is little evidence that remedial course offerings improve the skills they attempt to." While more recent research supports this critical assessment (Ragburn, 1975; Ramist, 1981; Cross, 1981), a small number of successes have been reported recently (Rodwick and Grady, 1976; Roueche, 1977; Sparks, 1977; Romoser, 1978). Where successful developmental studies programs have been reported, they have generally followed the adoption of a holistic approach to remediation which promotes cognitive, affective and behavioral growth of individual students.

Evaluation of Developmental/Remedial Programs

Programs for underprepared students have been developed and implemented since the mid-1960's; however, standard models and procedures for their evaluation have not emerged (Donovan, 1977). Grant (1978) summarizes some of the causes:

1. student assessment has often been synonymous with program evaluation

2. in developmental skills programs diagnosis and remediation often occur concurrently
3. the cause and the cure are sought together
4. educators are reluctant to divert minimal monies from actual programs to evaluation
5. there is an ethical question in experiments which would deny remediation to a control group
6. programs and staffs change too quickly
7. the lack of defined measurable goals
8. the alteration of too many variables at one time.

As a result, efforts to measure impacts of developmental/remedial programs on student achievement reflect an enormous diversity of design and method (Trillin, 1980).

Most evaluations of developmental programs are consistent, however, in asking the same questions Roueche did in a 1973 study:

How long did the students stay in the community college; that is, how long did they persist? Second, how well did they achieve? And finally, what was their attitude toward the programs and instruction in the community college?

Usually, these studies use test scores as pre-program measures while a variety of long-term measures may be employed to indicate students' performance after they leave the program. These commonly include grade in the next course, grade point average after a specified number of terms, verbal or quantitative grade point average, credits earned and retention/persistence in college (Trillin, 1980).

The use of all of these measures is revealed in the results of a national project which examined ten exemplary programs for under-prepared students (The Final Report of National Project II: Alternatives to the Revolving Door, 1977). While recognizing the questionable validity of

retention in itself as a measure of student achievement, the authors of this report state:

Until institutions of learning move from the position that their product is the number of credit hours generated and degrees granted to the concept that their major responsibility is to provide evidence of cognitive gain of their students, persistency towards earning credit and ultimately degrees will continue to be a most important measure of student learning.

Concerning the use of students' grades as evidence of cognitive gain, the report says:

Persistence by the student and retention by the institution of this student is (sic) a gross measure of student cognitive gain. It can be qualified by the grades a student earns, by comparing the number of credit units attempted to the number of credit units earned, and by tracking student performance through a series of courses or experiences for which success at later stages is contingent upon learning specific skills at earlier stages.

The variety of approaches used to evaluate developmental education programs is suggested in the results of a survey of Texas community colleges (Compensatory/Developmental Programs, 1975). Of 42 community colleges offering developmental studies, five have established control group experiments; 24 maintain follow-up records; 28 monitor attrition/retention rates; 24 evaluate improvements in grade point averages; and 19 apply measurement of non-cognitive behavioral change.

Literature Concerning the Variables Under Study

Number of Students Enrolled in Developmental Courses.

High levels of student enrollment in developmental coursework have been reported in the literature since the mid-1960's. Losak (1973) has reported the population for remedial coursework at 10-25 percent, while Bergman (1976) reports 53 percent of students entering Queensboro Community College in 1970 were assigned at least one such course. Reap (1980) reports that at one institution (1973-1980) 30 percent of English course offerings have been remedial and in mathematics, 74 percent.

In Virginia, a developmental studies evaluation at Thomas Nelson Community College reports that 40 percent of first-time students during the Fall Quarter, 1977, took one or more developmental courses (Braxton et.al., 1980). Consistent with this, the SCHEV study reports that at the largest campuses of Northern Virginia Community College, 34-41 percent of students entering Fall Quarter, 1979, enrolled in at least one developmental course.

Sex, Race, Age. While early descriptions of the characteristics of new students suggested they are likely to be female (Moore, 1970; Cross, 1971), more recent evidence indicates that there is a higher percentage of men participating in remedial programs than women (Linthicum, 1979; Reap, 1980). Black and other minority representation is dependent on regional variables, but generally these

groups are overrepresented. Whites constitute the large majority of developmental students--about 70 percent (Linthicum, 1979). No particular age group appears to be overrepresented among the developmental population. The average age is about 30 years and the age distribution generally reflects that of the total institutional enrollment (Linthicum, 1979).

Student Persistence The holding power of an institution is considered a gross, but significant indication of its effectiveness (Blai, 1972), and reports about student attrition/persistence are widely reported in the literature (Pantages and Creedon, 1978). Although studies of student attrition have been criticized for lumping together different forms of leaving behavior (Tinto, 1975), e.g. the failure to distinguish between permanent and temporary withdrawal, most institutional research defines "dropout" as the loss of students from a particular college rather than from higher education in general (Pantages and Creedon, 1978).

Pascarella and Terenzini (1979, 1980) report success in applying Tinto's (1975) predictive model of the dropout process. Tinto's conception, which relates persistence to the degree of "fit" between the academic and social environment of the college and student characteristics, suggests that the nature of the institution plays a larger role in influencing dropout behavior than had been previously thought. About this, Tinto (1975) states:

Clearly much more remains to be known about the effects of institutional characteristics upon dropout among individuals of differing characteristics. What we do know is, at present, quite crude; namely that four-year institutions, private institutions and high quality institutions have lower dropout rates than do two-year institutions, public institutions and lower quality institutions. How these differences come about or for which types of persons the differences are greater, smaller, or even reversed is, thus far, beyond our reach.

Although there are indications that much college student attrition is explained by factors over which institutions have no control--personal problems, illness, short-term educational goals (Ramist, 1981; Friedlander, 1981), high attrition rates at community colleges have been the cause of concern. Pezzullo (1978), reviewing this literature, reports that community college attrition rates range from 20.9 percent to 70.5 percent. A study by Astin (1975) reveals:

Of all types of institutions, the public two-year or community colleges consistently show the highest dropout rates (mean of approximately 59 percent). Rates are somewhat higher--above 65 percent--at two-year colleges located in the West and Southwest.

Relatively consistent with this, the subject institution, reports 48 percent attrition following the Fall Quarter, 1980.

Pezzullo (1978) also reports that those most prone to dropping out are part-time students, vocational/technical or business majors, members of ethnic minorities, "older" students, women, "special" students and Protestants. Other factors she found associated with community college student

attrition are low self-concept of ability, high debilitating anxiety, low internal reinforcement of control and lack of goal and value clarity (1978).

While the evidence suggests it is not only the academically underprepared students who drop out, remedial programs have reflected disproportionately high attrition rates. According to Roueche (1968) attrition rates in community college remedial programs are between 80 to 90 percent. Calling these figures "alarming," Roueche, Mink and Abbott (1978) claim that few developmental students have persisted for more than a semester. Snyder and Blocker (1970), in a study of developmental students who matriculated over a three-year period, found that between 33 and 40 percent of the students do not return for a second year. Less than a quarter of the students earned at least a "C" average and only 27 percent earned an associate degree.

More recently, as some community colleges have begun to implement developmental programs based upon the global needs of students, considerable improvements in persistence have been reported. Roueche (1973) reports the early evidence for this, observing that retention rates in the few existing exemplary programs he studied ranged from 75 to 90 percent. Donovan (1977) reports that 75 percent of remedial students at Bronx Community College returned for a second semester. And Sparks (1977) found that 70 percent of developmental students moved on to credit coursework. A statewide assessment of developmental education in Ohio

(Romoser, 1978) reports that developmental students compare favorably with regular students and adjust more easily to regular courses than non-developmental students.

Recent studies at Virginia community colleges which have developmental studies programs show favorable retention results as well. Thomas Nelson Community College (Braxton et.al., 1980) reports that a substantially higher proportion of developmental students (73%) returned for a second term than "other" students (62%). And Lesnick (1980) found that 82 percent of the subjects in a remedial reading study reenrolled for the following quarter at Northern Virginia Community College.

Grades Quality of student achievement is generally determined by grade point average. Based on a formula that equates letter grades to numbers, an average is determined by dividing the number of points by the number of credits attempted. These averages are recomputed at the conclusion of each term and become the quantified measure of the quality of student progress (Donovan, 1977).

The use of grades as one indicator of the effectiveness of developmental studies programs has been recommended by Roueche and Kirk (1973). They state:

Indeed, much concern has been voiced about the over-emphasis on grades as an indicator of academic success. Certainly there are questions of goals and values involved. Nevertheless, grades as an important index of academic performance cannot be disputed. In addition, existing research defines academic performance almost exclusively in terms of grades. For these reasons the criterion of performance during each

period of enrollment in this study was the mean grade point average (GPA) of a student enrolled in a developmental program. The GPA was determined not only for the time the student was enrolled solely in a remedial program but throughout his college enrollment as well. GPA was assessed each semester and cumulatively for the whole college career.

Other approaches used to evaluate academic achievement of remedial students are (1) monitoring single course GPAs, (2) comparing the number of credit hours attempted to the number earned, and (3) tracking students' progress through specific courses for which the remediation ostensibly prepared them. There is consistency among the various approaches in relying on the 2.00 or better GPA as a program success criterion to indicate satisfactory student progress (Donovan, 1977).

The literature is inconclusive regarding the general effectiveness of developmental education programs when GPA is the measure of success. Early literature reports underscore the poor performance of developmental students when compared with that of other students (Snyder and Blocker, 1970; Jelfo, 1974; Roueche and Snow, 1977). More recently, studies highlighting innovative programs indicate that the grade performance of the two groups is often comparable (Bergman and Gerace, 1974; Donovan, 1977; Reap, 1980). Even where the "holding college" or non-credit remedial approach is used, there are favorable reports. In Ohio, students who completed developmental programs "tended to do well in regular courses," according to Romoser (1978). Sparks (1976) also reports that developmental

students do as well as other students in their post-developmental coursework.

That there is wide variability in the results achieved by various developmental programs is suggested by the results of studies by several researchers. Craig (1975), in assessing the effectiveness of developmental education at three urban community colleges in Virginia, found no significant difference between the academic performance of developmental students and comparable students not enrolled in developmental studies. Between comparable groups of students, those who chose not to take remediation earned consistently higher GPAs (although not significantly) than those who did.

Similar findings are reported by Linthicum (1979) in a statewide assessment of Maryland community college programs. From a sample of developmental English students representing eight of the 16 community colleges, only slightly more than half completed a college-level English course. When the success of this sample was measured, however, against the success of students enrolled in credit English 101, the results show 85 percent made passing grades. In other findings, students in control groups at six of the colleges were inclined to make higher cumulative grade point averages than developmental students, and, at the four colleges using a traditional grading system, the average GPA for developmental students was less than 2.0. This study also compared developmental and control group

students with similar abilities. Low ability students in the control group generally completed as many courses as they began, remained in college as long, and made similar grades as low scoring students in the developmental group.

More encouraging results have been obtained from studies at two Virginia community colleges. Thomas Nelson Community College (Braxton et.al. 1980) in a comprehensive evaluation of its developmental studies program, tracked for three years the academic progress of 1358 first-time students who enrolled in the Fall, 1974 -- 380 developmental students and 978 others. The results of the study reveal that over 70 percent of successful developmental students enrolled in a credit English course and, comparable with the Maryland study, 84 percent passed the course. At this school, the overall performance of developmental students compared quite favorably to that of the non-developmental students. Although developmental students' GPAs and cumulative credits completed were below those of other students, GPA did average above 2.0.

Finally, other positive findings emerged from a study at Piedmont Virginia Community College conducted by Whittle (1980). The performance of 560 students enrolled in developmental and credit English was tracked over eleven quarters, from Fall 1974 to Winter 1977. Fifty-nine percent of students who initially enrolled in developmental English attempted a credit English course. Seventy-one percent passed and 65 percent did so with at least a "C" grade.

III. METHODOLOGY

This chapter describes the method used to answer the research questions. Information about the background of the institution and the setting of the study is presented. The nature of the developmental studies program is characterized and each developmental studies course is described. Next, the design of the study is presented, followed by a description of the population and the method of data collection. The chapter then concludes with a discussion of the research procedure.

Background and Setting

The subject institution is a multicampus urban community college enrolling more than 16,000 students annually. Serving a highly urbanized region in southeastern Virginia, the college operates on three permanent campuses and at several off-campus locations in the community. Its purpose, as stated in the 1981-82 College Catalog is:

...to serve the needs of qualified youth and adults beyond high school age and to prepare them for employment, for advanced collegiate education, and for improved citizenship.

As an open admissions institution, the college accepts "any person who has a high school diploma or the equivalent, or is eighteen years of age, and in any case is able to benefit from a program of instruction." Prerequisite

requirements do exist, however, for some specific courses and curriculums. A person lacking specified prerequisites "...may be eligible to enter the curriculum of choice after he has completed an approved developmental studies program."

The Developmental Studies Program, according to the catalog:

...is offered to prepare individuals for admission to occupational-technical and university parallel-college transfer programs in the college. Offerings in the program are designed to develop the basic skills necessary for success in other programs at the college. Students may be advised to enroll in developmental studies after an analysis and appraisal of their high school transcripts, test scores, and other data available concerning their past achievement. Students may enroll for regularly scheduled developmental studies courses or use the materials and equipment of the learning laboratory for individual study.

Testing

A battery of tests is required of all students who either, (1) intend to enroll for twelve or more credits, (2) have chosen a curricular program of study, or (3) intend to enroll in credit English or mathematics courses. The Comparative Guidance and Placement Test is utilized for assessment along with a locally developed mathematics test.

Developmental Studies Program

Courses offered are in mathematics, English and reading. "Program" refers to general institutional goals rather than to a systematic coordination between courses. The courses are not housed in a single administrative division; rather, they are assigned to various subject-area divisions at the college.

Developmental courses are commonly offered for five credits (not applicable toward graduation). Developmental units are calculated as "registration credits" for purposes of determining course load and tuition charges.

The grading policy for developmental courses is as follows:

- S Satisfactory. Assigned when a student completes all objectives of a particular course.
- R Re-enroll. Assigned when a student is making satisfactory progress but has not completed all instructional objectives for the course.
- U Unsatisfactory. Assigned when the student has made unsatisfactory progress.

Students may re-enroll as many times as necessary to complete the instructional objectives of a course.

Developmental Mathematics

Several developmental courses are offered to prepare students for specific credit mathematics courses. Students' test scores and curricular math requirements determine the need to enroll in one or more of the following courses:

Math 05	Basic Arithmetic
Math 06	Basic Algebra I
Math 07	Basic Algebra II
Math 08	Geometry
Math 09	Trigonometry

MATH 05, Basic Arithmetic

A developmental course in review of arithmetic principles and computations, designed to develop the mathematical proficiency necessary for selected curriculum

entrance. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed. Variable hours...(College Catalog, 1981-82)

Descriptions for the remainder of developmental mathematics course are identical except for the obvious changes in course content. Thus, they are not included here.

Developmental Reading

Reading Improvement (English 08) is offered for students whose test results suggest the need to increase comprehension, skill and speed in reading. Two campuses offer this as a two-part sequence, Basic Skills in Reading I and II (English 03-04).

ENGL 08 Reading Improvement

A developmental course using modern techniques, equipment, and materials to increase the student's comprehension, skill, and speed in reading. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed (College Catalog 1981-82).

ENGL 03 Basic Skills in Reading I

An individualized course designed to help students improve basic comprehension and word attack skills. Students may re-register for this course in subsequent quarters as necessary until they complete the course objectives (College Catalog 1981-82).

ENGL 04 Basic Skills in Reading II

Designed to help students improve reading rate and build such skills as finding and remembering facts, making inferences, drawing conclusions and getting meaning from context. Students may re-register for this course in subsequent quarters as necessary until they complete the course objectives (College Catalog 1981-82).

Developmental English

Verbal Studies (English 01) is a basic writing course emphasizing fundamentals of punctuation, grammar and paragraph writing. Again, at two campuses this is offered in two parts, Verbal Expression (English 07), Language and Thought (English 09).

Satisfactory completion of either English 01 or English 09 is considered prerequisite to readiness for success in credit English 101, Communication Skills I, or English Composition I (English 111). The latter are both traditional introductory college writing courses.

ENGL 01 Verbal Studies Laboratory

A developmental course in composition designed for students who need help in all areas of writing to bring their proficiency to the level necessary for entrance into their respective curricula. Emphasis on individual instruction. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed (College Catalog 1981-82).

ENGL 07 Verbal Expression

A developmental course designed to improve the students's written and spoken communication. Review of effective writing practices. Emphasis on practical application; the writing of instructions, explanations, business letters, job applications, summary paragraphs, methods of informative writing, outlining, reading for understanding, and vocabulary building; unity, development and organization in writing. Practice in listening and speaking, giving and following instructions, short informative talks. Intensified practice in varied speaking and writing problems. Students may re-register for this course in subsequent quarters as necessary until the course objectives are completed (College Catalog 1981-82).

ENGL 09 Language and Thought

A developmental course designed to develop an awareness of the language which students use and are exposed to.

Emphasis on the ability to distinguish fact from opinion, theoretical from observational terms, good arguments from poor arguments, prescription from description, construction of forceful arguments and a clearer understanding of the art of writing and speaking which will prove beneficial in all disciplines (College Catalog 1981-82).

ENGL 101 Communication Skills I

Prerequisite satisfactory score on appropriate English proficiency examination. Designed to teach the student to use the English language correctly and effectively and to develop skill in the preparation of reports, articles, essays, and correspondence related to technical fields. Attention to sentence structure and paragraph development to express thoughts in lucid, coherent, well-developed form. Reading selections provide material for discussion and supply topics for frequent writing assignments. Lecture 3 hours per week (College Catalog 1981-82).

ENGL 111 English Composition I

Prerequisite satisfactory score on appropriate English proficiency examinations and 4 units of high school English or equivalent. Expository and argumentative writing, ranging from single paragraphs to essays of some length and complexity. Study of logical, rhetorical and linguistic structures; the methods and conventions of preparing research papers; and the practical criticism of literary types. Lecture 3 hours per week (College Catalog 1981-82).

Campuses

The college's three permanent campuses differ with respect to location, numbers of students served and curricula offered. For the purposes of this study, they are distinguished as Campus A, as Campus B or as Campus C.

Campus A, located within an industrial/urban center, is characterized by a heavy concentration of students specializing in occupational/technical programs. In the fall of 1981, this campus served 4695 students.

Campus B, by contrast, enrolled 9351 students during the same fall session. This branch serves an urban/suburban

student clientele and reflects a concentration in the health sciences areas and college transfer programs.

Campus C is located in a rural/suburban setting, which serves as area characterized by heavy industry, business and agriculture. The 2,072 students who enrolled at this campus in the fall of 1981 were in an evenly distributed range of award programs.

Design of the Study

The goals of this study are (1) to identify the number and demographic characteristics of students served by developmental studies, (2) to determine the academic achievement and persistence at the institution of these students, and (3) to identify the performance of developmental English students in regular college English. Corresponding data are also gathered for nondevelopmental students to permit comparisons.

Two approaches were used to accomplish these goals:

1. A descriptive analysis of the variables of age, sex, race, enrollment status, and day/night attendance to determine patterns of distinguishing characteristics between developmental and other students.

2. A static group comparison (Cook and Campbell, 1979) to detect differences in performance in English 101/111, in cumulative GPA, in credits completed and in the number of quarters attended between developmental and other students. In this design a group receiving a treatment is compared with one which does not.

The English area was selected for the comparison because the apparent benefit of this remediation can be more easily isolated than in the case of either reading or mathematics. The effects of improvements in reading are very difficult to follow, given the fundamental nature of this ability and the range of courses requiring it. Similarly, in mathematics, since the extent of the need to take ever more advanced developmental courses is determined by curricular choice, an unmanageable complexity of combinations results which makes difficult the identification of the real effects of this kind of remediation.

Population

Subjects for the study were all new students entering the institution in the Fall Quarter, 1980.

Data Collection

Data were obtained from student files indicating demographic characteristics, enrollment, course and grade information. A Fall 1980 New Student File, created by the College's Office of Institutional Research, and stored at the community college system's regional computer center, was the primary source of data.

Procedure

Answers to the research questions were sought from the data available for all new students to the institution, Fall 1980. Since an answer to the third research question

concerning persistence required some control over students' intention to continue enrollment throughout the six quarter interval encompassed by this study, the college's student classification system was incorporated for this analysis.

Under the classification system, students are assigned a numerical program level code corresponding to type of curricular program. This is indicated as follows:

Level
of
Program

- 1 University Parallel. This refers to the college transfer degree programs - Associate in Arts, Associate in Science. This is a freshman classification of students with forty-five credits or less.
- 2 Developmental Studies. This is a mechanism for classifying developmental students and was not utilized at the time of this study.
- 3 Diploma. Refers to the two-year nondegree occupational curricula.
- 4 Certificate. Refers to a nondegree occupational program of study of shorter duration than other curricula.
- 5 Unclassified. A classification that permits categorization of students goals as follows: developing skills for a new job, upgrading employment skills for present job, career exploration, auditing a course, nondegree transfer student, high school student, personal satisfaction, awaiting acceptance into a restricted curriculum.
- 6 Occupational/technical degree program. This refers to Associate in Applied Science degree programs which are designed to prepare students for employment upon completion.
- 7 University Parallel. This classifies sophomores, those who have completed more than forty-five credits.
- 8 Diploma. This also classifies sophomores.

- 9 Occupational/technical program. This classifies sophomores who are in this kind of program.

Levels seven through nine are excluded in this study because the subjects would not have been categorized in any of them.

It was decided to conduct one analysis of the total file (i.e. students from all levels), and another analysis which excluded Level Four (one year certificate) and Level Five (unclassified) students. It was assumed that in this way students not intending to remain for at least six quarters, would be selected out of the groups to be compared on the basis of persistence.

An additional consideration was that apparent inconsistencies in the student classification process might exclude those new students actually seeking completion of a two-year program from inclusion in this study. An analysis was conducted to determine how many of the new students, initially unclassified, were curriculum-placed in either of the two terms following Fall Quarter 1980. Because the results indicated that only a very small number changed classification (five percent, $n=154$), it was decided to limit the analysis concerning persistence to new students Fall 1980 who, when they enrolled, were classified in a two year program.

Grade Performance and Developmental Students. Two analyses of GPA data were utilized in an attempt to make meaningful comparisons between the two student groups. The first, an analysis of variance in which GPA was the dependent measure, tested for significant effects between

developmental status and six intervals indicating a range of credits completed. Since fifteen credit hours has traditionally been considered a normal full-time student load, and because of the need to limit the numbers of intervals, it was decided to compare GPA in these six credit hour intervals: 1-14, 15-30, 31-45, 46-60, 61-75, 76-90.

An important issue in designing this study was to determine whether or not to include all of the intervals in the analysis. Concerning the reliability of GPA as a measure of performance, it was considered that a GPA representing few course credits is not a sufficient sample of the behavior under investigation to allow generalizations to be made. A GPA representing 14 or less credits lacks the reliability of one representing 76 credits, for example. Thus, despite the concern over losing a large proportion of the sample, it was decided that the unreliability associated with the 1-14 credit interval required its exclusion. The ANOVA was conducted for the intervals of 15 credits or more.

The second analysis examined the distribution of grades for developmental and nondevelopmental students. It was included to permit an assessment of the number of students who made passing grades (i.e. achieved a GPA of 2.0 or better) and to discern any meaningful patterns of difference between groups within the credit intervals. Data were excluded for students with less than 15 credits to provide some equalization of the two groups. Additionally, since developmental students took course(s) that were non-credit,

this allowed them to "catch up" to the credit level of their nondevelopmental colleagues before their GPAs were included.

Performance in College English. In this part of the study developmental English students' grades were compared with those of students who had taken no developmental English courses. Subjects in the developmental group were all new students, Fall 1980, who received a grade of S (satisfactory) in either Engl 01, Verbal Studies, or Engl 09, Language and Thought, and who attempted college English 101 or 111 within six quarters. Subjects in the nondevelopmental group were new students, Fall 1980, who attempted credit English within six quarters, but had not taken developmental English. Those developmental English students who earned grades of R (re-enroll) or U (unsatisfactory) and who subsequently did not obtain an S were excluded from the analysis. Also, only the grade from a student's first attempt at college English was included in the analysis; a higher grade obtained in a subsequent attempt was ignored.

Two analyses of English course data were made. The first tested for significant differences between the two student groups in college English mean GPA and for the effects of the type of English course (i.e. 101 and 111). A second analysis examined the distribution of grades in college English of developmental and nondevelopmental students.

IV. RESULTS

This chapter presents answers to the questions posed by this study. Each question is restated and a description of the result obtained is given. Tables are included where illustration serves to amplify or clarify the data.

Research Question One How many students who entered in the Fall Quarter, 1980 were enrolled in one or more developmental courses?

The observed frequencies in Table 1 indicate that of 5735 new students, 1555 or 27.1 percent enrolled in at least one developmental course. Campus B, as expected, enrolled the largest percentage of all developmental students (59.3), while Campus C enrolled the smallest (15.6). Campus C had the highest percentage of new students taking a developmental course (29.9), however, differences were nonsignificant across campuses.

Research Question Two Are students enrolled in one or more developmental studies courses distinguishable from other students on the basis of the variables age, sex, race, enrollment status, day/night attendance?

Age. A significant association was found between age and enrollment in a developmental course. As indicated in Table 2, 1101 or 19.2 percent of all new students were developmental students aged 15-25. Interestingly, while the 15-25 age grouping accounted for 45.4 percent of nondevelopmental students, this category accounted for 70.1 percent of the developmental students. Only about thirty

TABLE 1
 NEW STUDENTS FALL 1980
 DEVELOPMENTAL STATUS BY CAMPUS

Campus	Developmental	Nondevelopmental	Total
A	390 ¹ (6.8) ²	1075 (18.74)	1465 (25.54)
B	922 (16.08)	2535 (44.20)	3457 (60.28)
C	243 (4.24)	570 (9.94)	813 (14.18)
Total	1555 (27.11)	4180 (72.89)	5735 (100.00)

Chi-square 3.693, ns

df=2

¹Frequency

²Percent

TABLE 2
DEVELOPMENTAL STATUS BY AGE GROUP

	15-25	26-35	36-45	46 +	Total
Developmental	1101 (19.22)	257 (4.49)	137 (2.39)	59 (1.03)	1554 (27.13)
Nondevelopmental	1896 (33.11)	1278 (22.32)	652 (11.38)	347 (6.06)	4173 (72.87)
Total	2997 (52.33)	1535 (26.80)	789 (13.78)	406 (7.09)	5727 (100.00)

Chi-square 294.310

df=3

p<0.0001

percent of developmental students, then, were over twenty-five years of age. Clearly, developmental students are significantly younger than their nondevelopmental counterparts.

Sex. Of 5735 new students in the Fall 1980, 2377 or 41.5 percent were male and 3358 or 58.5 percent were female. While Campus B had the highest percentage of female students, the differences across campuses by sex were nonsignificant. A significant association between sex and developmental studies was found, as indicated from the frequencies shown in Table 3. Among the developmental group, 51 percent (n=794) were males. In contrast, there were only 37.8 percent males among nondevelopmental students. So, while females predominate in the total group of new students, within the developmental group there is a considerably higher proportion of males.

Race. College-wide, 81 percent of new students were white and 19 percent were nonwhite. Examination of Table 4 reveals that the three campuses differed considerably in racial composition; at Campus B 86 percent of students were white, while at the remaining two campuses this number was significantly smaller. In terms of developmental studies enrollment, a significant association with race was found. Table 5 indicates that 44 percent of nonwhites were developmental enrollees compared with 23 percent of whites.

TABLE 3
DEVELOPMENTAL STATUS BY SEX

	Male	Female	Total
Developmental	794 (13.84)	761 (13.27)	1555 (27.11)
Nondevelopmental	1583 (27.60)	2597 (45.28)	4180 (72.89)
Total	2377 (41.45)	3358 (58.55)	5735 (100.00)

Chi-square 81.253

df=1

p<0.0001

TABLE 4
CAMPUS BY RACE

Campus	White	Nonwhite	Total
A	1047 (18.26)	418 (7.29)	1465 (25.54)
B	2972 (51.82)	485 (8.46)	3457 (60.28)
C	631 (11.00)	182 (3.17)	813 (14.18)
Total	4650 (81.08)	1085 (18.92)	5735 (100.00)

Chi-square 148.512

df=2

p<0.0001

TABLE 5
DEVELOPMENTAL STATUS BY RACE

	White	Nonwhite	Total
Developmental	1073 (18.71)	482 (8.40)	1555 (27.11)
Nondevelopmental	3577 (62.37)	603 (10.51)	4180 (72.89)
Total	4650 (81.08)	1085 (18.92)	5735 (100.00)

Chi-square 202.886

df=1

p<0.0001

Enrollment Status. For new students to the institution, the pattern of full-time/part-time enrollment was not consistent across campuses. Similar patterns were in evidence for campuses B and C, where approximately one-third of students attended full-time. At Campus A, however, less than one-fourth of students enrolled for a full-time credit load. Developmental studies was found to be significantly associated with enrollment status. Results presented in Table 6 show that while less than one-third of all new students attended full-time (30.3 percent), 1017 or 65.4 percent of developmental students were enrolled on a full-time basis. It is evident that full-time students also tend to be enrolled in a developmental course.

Day/night Attendance. Analysis of the data in Table 7 indicates the significant association found between developmental enrollment and daytime attendance patterns. Of the 5735 new students, 1325 or 23.1 percent were daytime students taking a developmental course. Among nondevelopmental students, the percentages of daytime versus evening attendance are nearly the same; 36.9 percent and 35.9 percent, respectively. While among nondevelopmental students nearly equal numbers attended daytime versus nighttime, among the developmental students a much higher percentage (85.2 percent) attended during the daytime than during night (14.8).

TABLE 6
DEVELOPMENTAL/NONDEVELOPMENTAL BY ENROLLMENT STATUS

	Full-time	Part-time	Total
Developmental	1017 (17.73)	538 (9.38)	1555 (27.11)
Nondevelopmental	725 (12.64)	3455 (60.24)	4180 (72.89)
Total	1742 (30.37)	3993 (69.63)	5735 (100.00)

Chi-square 1237.695

df=1

p<0.0001

TABLE 7
DEVELOPMENTAL STATUS BY DAY/NIGHT ENROLLMENT

	Day	Night	Total
Developmental	1325 (23.10)	230 (4.01)	1555 (27.11)
Nondevelopmental	2116 (36.90)	2064 (35.99)	4180 (72.89)
Total	3441 (60.00)	2294 (40.00)	5735 (100.00)

Chi-square 564.921

df=1

p<0.0001

Research Question Three. Is there an association between student developmental studies status and persistence at the institution?

The analysis of persistence considered data for the 2716 new students who were classified in a curriculum, Fall 1980. Of this number the highest percentages completed either one quarter (28 percent) or six quarters (21 percent) and the lowest percentages completed four and five quarters (see Table 8).

Persistence by Campus. A significant contingency was found for the developmental and nondevelopmental students on each of the three campuses. Somewhat surprising, however, was the difference found in the combined groups persistence across campuses. Analysis of this data (see Tables 9, 10, 11) indicates that the contingency may be due to the effects of Campus A students who were more likely (34 percent) to complete only one quarter than either Campus B students (26 percent) or Campus C students (27 percent). Additionally, Campus C students were considerably more persistent; 25 percent completed six quarters compared to 17 percent at Campus A and 21 percent at Campus B.

Developmental Students. Of 2716 curricular students, 965 or 36 percent enrolled in a developmental course. This is a slightly higher proportion than was found among the total population of new students (27 percent). As indicated in Table 8, a difference was evident between the developmental and nondevelopmental students in the number of quarters completed. Nondevelopmental students (35 percent)

TABLE 8
CURRICULUM CLASSIFIED STUDENTS
DEVELOPMENTAL STATUS BY NUMBER OF QUARTERS ENROLLED

Status	Number of Quarters Enrolled						Total
	1	2	3	4	5	6	
D	164 (6.04)	148 (5.45)	194 (7.14)	99 (3.65)	90 (3.31)	270 (9.94)	965 (35.53)
ND	605 (22.28)	272 (10.01)	313 (11.52)	143 (5.27)	123 (4.53)	295 (10.86)	1751 (64.47)
Total	769 (28.31)	420 (15.46)	507 (18.67)	242 (8.91)	213 (7.84)	565 (20.80)	2716 (100.00)

Chi-square 113.719

df=2

p<0.0001

TABLE 9
CURRICULUM CLASSIFIED STUDENTS AT CAMPUS A
DEVELOPMENTAL STATUS BY NUMBER OF QUARTERS ENROLLED

Status	Number of Quarters Enrolled						Total
	1	2	3	4	5	6	
D	30 (4.37)	20 (2.92)	50 (7.29)	20 (2.92)	18 (2.62)	56 (8.16)	194 (28.28)
ND	207 (30.17)	81 (11.81)	72 (10.50)	46 (6.71)	26 (3.79)	60 (8.75)	492 (71.72)
Total	237 (34.55)	101 (14.72)	122 (17.78)	66 (9.62)	44 (6.41)	116 (16.91)	686 (100.00)

Chi-square 68.263

df=5

p<0.0001

TABLE 10
 CURRICULUM CLASSIFIED STUDENTS AT CAMPUS B
 DEVELOPMENTAL STATUS BY NUMBER OF QUARTERS ENROLLED

Status	Number of Quarters Enrolled						Total
	1	2	3	4	5	6	
D	98 (6.07)	105 (6.51)	109 (6.75)	65 (4.03)	58 (3.59)	157 (9.73)	592 (36.68)
ND	320 (19.83)	158 (9.79)	200 (12.39)	88 (5.45)	70 (4.34)	186 (11.52)	1022 (63.32)
Total	418 (25.90)	263 (16.29)	309 (19.14)	153 (9.48)	128 (7.93)	343 (21.25)	1614 (100.00)

Chi-square 51.515
df=5
 p<0.0001

TABLE 11
CURRICULUM CLASSIFIED STUDENTS AT CAMPUS C
DEVELOPMENTAL STATUS BY NUMBER OF QUARTERS ENROLLED

Status	Number of Quarters Enrolled						Total
	1	2	3	4	5	6	
D	36 (8.65)	23 (5.53)	35 (8.41)	14 (3.37)	14 (3.37)	57 (13.79)	179 (43.03)
ND	78 (18.75)	33 (7.93)	41 (9.86)	9 (2.16)	27 (6.49)	49 (11.78)	237 (56.97)
Total	114 (27.40)	56 (13.46)	76 (18.27)	23 (5.53)	41 (9.86)	106 (25.48)	416 (100.00)

Chi-square 15.766

df=5

p<0.0075

were twice as likely as developmental students (17 percent) to complete only one quarter of enrollment in the six. More interestingly, 28 percent of developmental students completed six quarters, while only 17 percent of their nondevelopmental counterparts did so. Developmental students, then, tended to be more persistent in school while nondevelopmental students reflected a propensity toward completing only one quarter.

Persistence by Enrollment Status. Since it had been established that developmental students are much more likely than nondevelopmental students to be enrolled full-time (Table 6), an analysis of variance was conducted to determine whether the higher persistence rates for the developmental group might be explained on the basis of a fulltime enrollment pattern. The interaction of enrollment status and developmental status was significant ($F(1,2712)=43.78, p < .0001$); enrollment status and developmental status did combine to affect persistence.

The interaction is illustrated in Table 12. According to the table, full-time students had significantly higher persistence rates that were equivalent for the developmental and nondevelopmental groups. However, among part-time students the developmental group had a higher persistence rate than nondevelopmentals, although not significantly. It appears that developmental students are equally persistent regardless of their enrollment status. Part-time nondevelopmental students, however, have a significantly lower persistence rate.

TABLE 12
 DEVELOPMENTAL AND NONDEVELOPMENTAL STUDENTS
 NUMBER OF QUARTERS COMPLETED
 BY ENROLLMENT STATUS

	Full-time	Part-time
Developmental	3.83 (715)	3.07 (250)
Nondevelopmental	3.82 (535)	2.46 (1216)

$d < .05 = .92$

Research Question Four. Is there an association between student developmental studies status and GPA?

The analysis of grade performance examined the mean GPA for developmental and nondevelopmental students over the six quarter period encompassed by the study. Students' GPAs were obtained for each of the following credit hour intervals: 1-14, 15-30, 31-45, 46-60, 61-75, 76-90.

The population of students represented by the six intervals was 4955. When the potentially less reliable 1-14 interval was excluded, 3142 or 63 percent of the sample was eliminated from analysis. This left 1992 students who were included in the analysis of variance that tested for significant differences in mean GPA.

When mean GPAs were compared between the two groups, nondevelopmental students obtained higher GPAs than their developmental colleagues. The all-intervals GPA for developmental students was 1.97, in contrast to 2.46 for nondevelopmentals. Interestingly, in the analysis which excluded students who completed less than 15 credits, the difference in GPA remained comparable, yet for both groups GPA was above 2.0. Developmental students achieved a 2.34 mean GPA and nondevelopmentals 2.81. As expected, the influence of the large number of students who completed the fewest number of credits exerted a considerable effect on overall GPA.

The interaction of developmental status and credit hour intervals was significant ($F(5,4943)=44.53, p<.0001$) and Figure 1 illustrates the pattern. Developmental students'

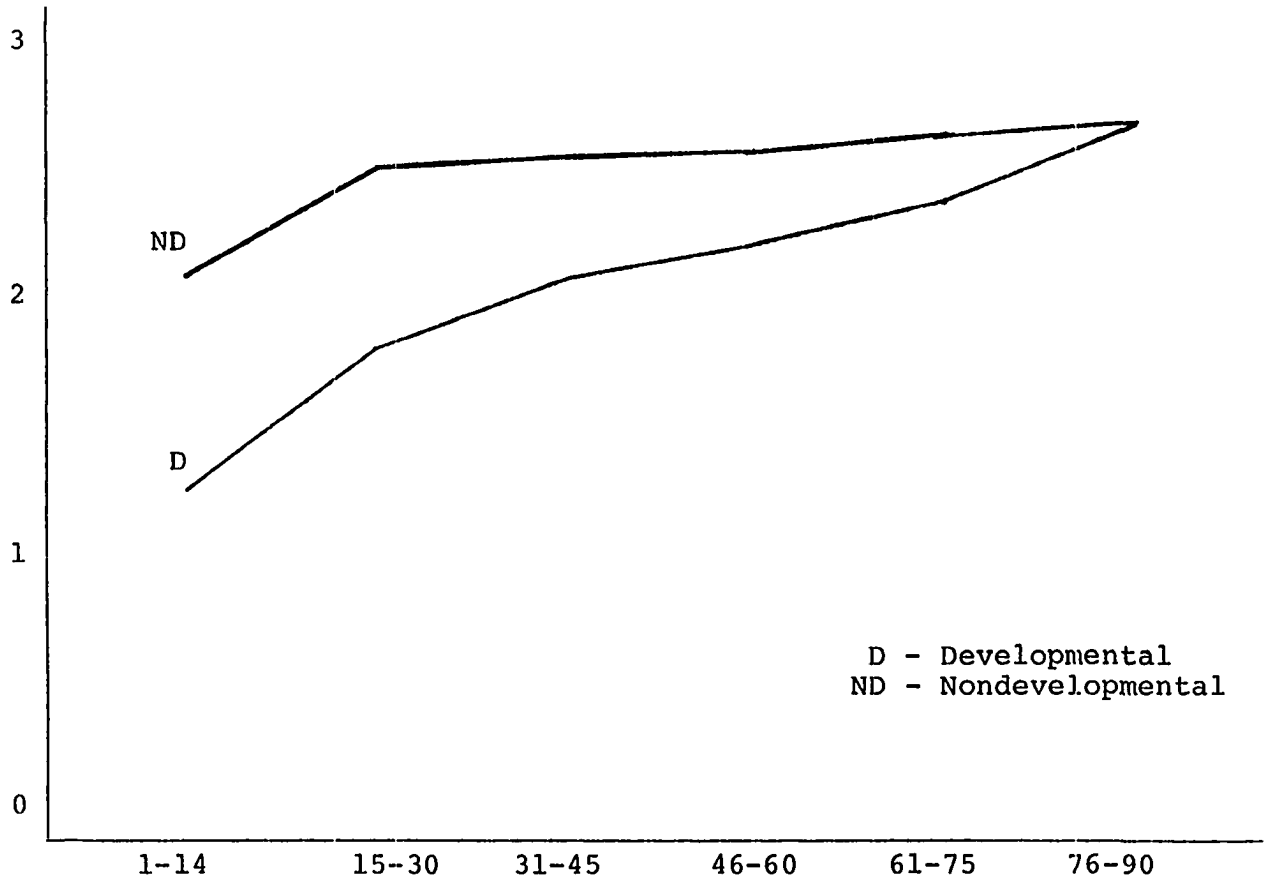


Fig. 1. Developmental and nondevelopmental students' mean GPA and credits earned at six intervals.

mean GPAs were consistently lower across the credit hour intervals than were those of the nondevelopmentals. However, although developmental students' mean GPA was comparably low in the least-credits interval, it increased linearly and even matched the nondevelopmental GPA at the 76 credit threshold. Since the developmental students achieved higher grades as they accumulated credits, it appears that those who remain in school can and do overcome initial deficits and eventually perform as well as their nondevelopmental counterparts.

In addition to the examination of mean GPA differences for the two student groups, data revealing the distribution of grades was also obtained. As specified in Table 13, within the six quarter interval encompassed by this study, developmental students who completed 15-90 credits were twice as likely (32 percent) as nondevelopmentals (16 percent) to obtain a mean GPA below 2.0. Nevertheless, a substantial majority of the developmental students (68 percent) did achieve a 2.0 GPA or higher. This number, when contrasted with the comparable figure for developmentals (84 percent), reveals that developmental students' grade performance, though beneath that of nondevelopmentals fell only 16 percentage points below.

Subsidiary Analysis. Developmental students were defined in this study as those who were enrolled for at least one course defined by the institution as developmental. One issue is whether students who enroll in

TABLE 13
DEVELOPMENTAL STATUS AND GPA

Status	GPA Level				Total
	0-0.99	1.0-1.99	2.0-2.99	3.0 +	
D	13 (0.68)	216 (11.24)	348 (18.11)	148 (7.70)	725 (37.72)
ND	8 (0.42)	182 (9.47)	441 (22.94)	566 (29.45)	1197 (62.28)
Total	21 (1.09)	398 (20.71)	789 (41.05)	714 (37.15)	1922 (100.00)

more than one developmental course perform much differently in their coursework than those who take only one such course. Presumably, the student who needs only a brief refresher in arithmetic or algebra will face less challenge in navigating college requirements than the student who also requires remediation in English and reading. For this reason it was thought useful to inquire, in the course of this study, whether the effect of enrolling in more than one developmental course was a significant one in terms of GPA. The question became more salient when it was learned, in a preliminary data analysis, that of the 911 students who took only one developmental course, 541 (71 percent) were enrolled in one of the developmental mathematics courses.

Students who enrolled for two developmental courses took at least one developmental English or reading course and those who took three developmental courses were enrolled in a combination of mathematics, English and reading. Since an increasing need for remediation might introduce risks to college success not associated with the need for one review course, it was decided to investigate the possibility that the more developmental courses students enrolled in, the lower was their GPA.

A one way analysis of variance was conducted using GPA as the dependent measure on three levels indicating students who enrolled in either one, two or three and more developmental courses. The main effect was significant

($F(2,1558)=49.70$, $p < .0001$), revealing an inverse relationship between the number of developmental courses and GPA. Students who enrolled in only one developmental course ($n=911$) obtained a GPA of 1.74. Those who took two such courses ($n=410$) earned 1.52, while the students with three or more courses ($n=240$) achieved 1.24.

Research Question Five. How do students who complete developmental English perform in college English 101/111?

This analysis examined the grade performance in college English of the 1617 new students in Fall 1980 who completed a credit English course within the six quarter interval encompassed by this study. An analysis of variance was conducted on obtained grades in English for developmental status and type of credit English (101/111). Significant differences in English grades were found only for developmental status ($F(1,1613)=38.26$ $p<.0001$). The mean English course grade for developmental students ($n=330$) was 1.85 compared to 2.32 for nondevelopmentals ($n=1287$).

Inspection of Table 14 reveals the distribution of grades earned by the student groups. As expected, a smaller percentage of developmental students received As and Bs than was true for nondevelopmentals and higher percentages obtained Fs and Ds. However, when the percentages of students who made C or better are compared, the difference is relatively small. Among nondevelopmental students 78 percent earned C or better in the credit English, yet 68 percent of the developmental students also did so. While not doing as well as their counterparts, it appears that a

TABLE 14
 ALL NEW STUDENTS FALL 1980
 DEVELOPMENAL STATUS BY ENGLISH 101/111 GRADE

Status	English 101/111 Course Grade					Total
	F	D	C	B	A	
D	58 (3.59)	47 (2.91)	126 (7.79)	84 (5.19)	15 (0.93)	330 (20.41)
ND	198 (12.24)	82 (5.07)	332 (20.53)	449 (27.77)	226 (13.98)	1287 (79.59)
Total	256 (15.83)	129 (7.98)	458 (28.32)	533 (32.96)	241 (14.90)	1617 (100.00)

Chi-square 72.358

df=4

p<0.0001

substantial majority of students who complete developmental English are able to complete college English with at least a grade of C.

V. DISCUSSION

This exploration of program effectiveness has sought to determine both the number and characteristics of developmental studies students, their achievement in credit coursework and their persistence in college. As well, performance in regular college English has been examined. This chapter includes discussion of 1) the results of this investigation in light of the existing literature; 2) theoretical implications of this study; 3) community college policy issues; 4) some limitations of this study; and 5) directions for future research.

Number of Students Enrolled in Developmental Studies

About one fourth (27 percent) of the subjects in this study enrolled in a developmental course. While this is slightly above the general estimate made by Losak (1973) of 10-25 percent, it is considerably below the participation rate indicated in other reports. For example, Bergman (1976) reported that 53 percent of students entering Queensboro Community College enrolled for a developmental course. Virginia urban community colleges also report a higher participation rate than that found here. Thomas Nelson Community College reported a 40 percent participation rate for Fall, 1977 (Braxton et. al., 1980) and, according to the SCHEV report, in the Fall of 1979 the largest

campuses of Northern Virginia Community College enrolled 34-41 percent of new students in developmental courses.

Differences between community colleges in developmental enrollment patterns are best viewed in terms of the interplay of numerous institutional and societal variables. Among community colleges there is little uniformity with regard to admissions, procedures, and course placement, key determinants of developmental enrollments. As well, regional, economic and social factors such as community demographics, employment patterns and availability of alternate sources of education influence strongly the nature of the population from which new students are drawn. Perhaps the comparatively smaller percentage of developmental students at the subject institution can be accounted for by the presence, in its service area, of healthy employment opportunities in the skilled trades and numerous sources of postsecondary education.

Age

Contrary to the evidence reported elsewhere, developmental students in this study were found to be significantly younger than nondevelopmental students. The finding that 70 percent of developmental students were aged 15-25 contrasts sharply with the results obtained by Linthicum (1979) which indicate no differences from overall institutional enrollment patterns. And as well, Reap (1980) reports that developmental students at her institution were older than nondevelopmentals.

It is likely that the choice of age intervals in the present study contributed to these apparent discrepancies. Typically, other researchers have examined a narrower band of age ranges than this study did. Because of this, it is difficult to tell how evenly or not developmental students distributed themselves within the 15-25 age interval. It is reasonable to expect, however, that since the emphasis in the present study was on first-time students, many of whom would have just graduated from high school, 18-21 year olds were a majority in the youngest age interval. In any case, developmental students in this institution tended to be younger than other new students and younger than what is indicated in other studies.

The tendency to youth in developmental studies invites the view that these are students who enter college lacking basic skills; that they are not the typically more experienced persons who return to school to obtain refresher work. We would expect this since we know that the college's testing procedure influences developmental enrollments. Specifically, annual high school graduations each spring contribute a large proportion of fall enrollees to college. Recent high school graduates are likely to be curricular and full-time students. Thus, they are more likely to take placement tests than those with different enrollment patterns. Because the younger students in this group are more likely to be tested than part-time evening students who enroll in specialty courses, the probability

that academic weaknesses will be revealed are increased for this group.

Sex

Early reports concerning the relationships of this variable to developmental studies programs suggested that females were more likely to participate than males (Moore, 1970; Cross, 1971). The present study's findings are more consistent, however, with recent reports indicating an opposite pattern. Here, while a majority of developmental students was male (51 percent), females predominated among nondevelopmentals (62 percent). Reap (1980) reported percentages in accordance with this, as did Linthicum (1979). Linthicum's study was limited to developmental English students, yet her results were very compatible; males were 55 percent of developmental students and only 37 percent of nondevelopmentals. An even higher percentage of males (66 percent) in developmental studies was reported by Braxton et. al. (1980) at Thomas Nelson Community College. At that institution, however, males comprised 48 percent of nondevelopmental students, in contrast to 38 percent at the subject institution.

Why males predominate in developmental courses is difficult to explain on the basis of the data obtained here. The interpretation that women have stronger verbal abilities than men may account for some of this phenomenon, but this would apply only for English and reading. Perhaps, since mathematics skills are the most likely to deteriorate

over time, it is the number of employed men returning to school part-time to take mathematics courses that is responsible for the incongruity.

An alternate possibility is that some of the disparity results from the presence of a substantial military community (active duty and retired) in the college's service area. We know that men predominate in numbers over women in the military and we can assume that many service persons are recent high school graduates who had not prepared for college. Further, in-service benefits programs offer strong incentives to encourage advanced education. In this they support pretesting and, as well, enrollment in appropriate developmental coursework. Thus, this particular group, comprised mainly of men, is more likely than others to take placement tests. Additionally, there are the service veterans who enroll under the G. I. Bill. These students, also primarily men, are required to select a program of study and therefore they are also more likely to take placement tests than others.

Race

As expected, the large majority of developmental students in this study was white. This finding is consistent with the pattern reported by others, notably Cross (1971) and by Linthicum (1979). The result obtained in the present study, that 69 percent of developmental students were white, is comparable to the 70 percent figure

that Linthicum reports in her state-wide study of developmental education in Maryland.

Consistent with other reports in the literature, a higher proportion of nonwhites was found to be in developmental coursework (44 percent) than was the case for whites (23 percent). Braxton et. al. (1980) indicate that of entering students at their institution (1974) 23 percent of whites and 40 percent of nonwhites were in developmental coursework. And Linthicum (1979), examining only the English area, found 42 percent of whites and 74 percent of nonwhites were enrolled in developmental English.

It is apparent from the results obtained here that nonwhites continue to be overrepresented in developmental studies. According to the subject institution's standard placement testing criteria, nearly two times as many nonwhites as whites are not academically prepared for college. The sources of this disparity have been extensively researched and reported in the literature on desegregation or minority elementary and secondary schooling. Olivas (1979) offers this concise summary:

...inequality in public K-12 systems results in unequal opportunities and outcomes for a disproportionate number of minority children....These unequal conditions in turn render less precise the usual indices of academic ability, particularly for nontraditional students, whose conceptual skills may be inadequately measured by traditional means of evaluation.

Thus, it appears that nonwhites tend to be overrepresented in developmental studies because of unique factors associated with previous schooling possibly in

combination with demand characteristics of the placement tests.

Enrollment Status

The literature reviewed for this investigation was consistent in excluding any examination of enrollment status. Nevertheless, the dimension of full-time versus part-time enrollment was considered an important one that would offer useful information about developmental students. This was borne out in the discovery that while nearly two-thirds of students in a developmental course were enrolled full-time, only 17 percent of nondevelopmentals enrolled on this basis. Obviously, full-time students tended also to be enrolled in developmental studies.

The observed disparity in enrollment status for the two student groups is most likely due to the influence of other variables examined in this study and is elaborated upon in that context below.

Day/Night Attendance

The literature reviewed for this study has virtually nothing to say concerning the role of this variable in describing developmental students. Nonetheless, in this study, the day versus night dimension was discovered to be an especially descriptive one. Developmental students were found to be much more likely than others to attend school in the daytime. Indeed, fully 85 percent of them did so, in contrast with only 51 percent of nondevelopmentals.

By itself, this information is of limited value, yet when it is combined with other findings, it does contribute to a comprehensive description of developmental enrollment patterns that is revealing. An elaboration of this follows below.

Developmental Student Enrollment Patterns

It has been established that full-time students are likely to be enrolled in a developmental course and that developmental students are more likely to be younger and to attend school in the daytime than their counterparts. In explaining this phenomenon, it seems reasonable to suppose that, since they are younger, many developmental students enroll full-time because they are in a position to commit more resources to education than those who are older. And because students who intend to enroll full-time are much more likely to take placement tests than those who plan to take only a course or two, the likelihood that academic weaknesses will be detected are thereby increased for this group. In this way, by virtue of an intention to enroll on a full-time basis, the likelihood of enrollment in developmental studies is substantially enhanced for this group.

In light of the tendency among full-time students to be younger and in developmental studies, it is not surprising also that so many were daytime students. Full-time course loads can best be arranged in the daytime and, as well, taking classes in the daytime is quite consistent with

younger students' previous experiences and expectations about attending school. Further, it may be that opportunities for the part-time employment that characterizes this age group are limited to late afternoon and evening hours and thus influence students' choices about when to attend.

Overall, there appears to be a basis to hypothesize the existence of two broad types of developmental students: those who are aged 15-25 years and carry a full-time load during the day, and those older students who enroll part-time for evening courses. If this indeed is the case, it may have implications for developmental studies in terms of appropriate instructional methodologies and course content as well as for support services such as counseling, financial aid and job placement.

Persistence

In contrast to early literature reports which indicated comparatively high attrition rates among developmental students (Roueche, 1968; Snyder and Blocker, 1970; Roueche, Mink and Abbott, 1978), developmental students in this study were found to be more persistent than others. This finding is consistent with results obtained in more recent studies that suggest a general maturation of developmental programs.

In the present study, it will be recalled, developmental students were much less likely to complete only one quarter and more likely to complete six quarters

than nondevelopmentals. As well, there was a pattern favoring developmental student persistence for the third through the fifth quarters of enrollment. Unlike this study, other investigations of persistence typically have defined this construct in terms of sequential enrollments and thus often have ignored the "stop-out" phenomenon, or intermittent enrollment pattern. By defining persistence in terms of the number of quarters completed, this study has accounted for this pattern, but does not address the sequencing of quarters. The finding that 83 percent of developmental students completed two or more quarters, compared to 65 percent of nondevelopmentals, then, does not indicate the sequence, but does provide a worthy basis for comparison.

Another methodological difference between this study and those reviewed above concerns the research subjects. In an attempt to control for students' intentions to persist, only curricular-placed students were included for that part of this investigation. The other studies, however, typically examined non-curricular students as well.

Notwithstanding differences of approach, the results obtained here are quite comparable with early reports focusing on exemplary developmental programs (Roueche, 1973), and, more interestingly, with several more recent ones. Donovan (1977), for example, reports that 75 percent of remedial students at Bronx Community College returned for a second semester. Lesnick (1980), in a study at Northern

Virginia Community College, reported that 82 percent of developmental reading students returned for the following term. Also in Virginia, Braxton et. al. (1980) found that 73 percent of developmental students returned for a second quarter compared to only 62 percent of nondevelopmentals.

In the present study, the general findings on student persistence were also analyzed with respect to the role one's enrollment status might play in the number of quarters completed. While persistence was equivalent for both groups of full-time students, part-time developmental students completed more quarters of enrollment than part-time nondevelopmentals. Thus, it appears that the comparatively higher persistence rates found in this study are due to the enrollment pattern of part-time developmental students.

The discovery that there was no significant difference in persistence between the two groups of full-time students is important because it indicates that, in general, full-time developmental students are not dropping out but are making progress toward their academic goals. Perhaps factors related to full-time attendance are more important in influencing persistence than whether or not one takes developmental studies.

Concerning part-time students, the differences in persistence found for the two groups most probably have to do with the increased likelihood that these persons are older, more mature, married, employed, and attend school in the evening. Typically, these students enroll in one or two

courses for purposes of personal interest/satisfaction or job advancement. Education for this group is likely to be only one of a constellation of other goals and commitments.

Perhaps developmental students within this group persist in school longer than nondevelopmentals because education has a comparatively higher value for them. Enrollment in basic skills courses indicates a need and willingness to obtain academic fundamentals and to thereby extend the date of curriculum completion. This may be taken to indicate that educational goals are more salient for such developmental students than for nondevelopmentals, and that a stronger commitment to education causes them to complete more quarters of study. In addition, education may have increased value for these developmental students because skill deficits in English, reading or mathematics may possibly have been experienced as socially and economically limiting in the past. It is not unreasonable to speculate that such limitations would have created barriers to advancement in the past that contrast sharply with the experiences of those students who are more adept.

Grades

One analysis of grade performance contrasted the distribution of developmental students' grades with that for nondevelopmentals. While nondevelopmentals clearly earned a higher percentage of As and Bs, a substantial majority of developmental students (68 percent) did achieve a 2.0 GPA or higher.

These findings are compatible with the results obtained in similar studies which combine a variety of approaches and methods. Bergman and Gerace (1974), in a study at Queensboro Community College, found a disparity between developmental and nondevelopmental students in the number of As and Bs earned that nearly matches the results found here. The same study reported also that 69 percent of former basic skills students made passing grades one semester following the completion of a remedial English or reading course. Consistent with this, Sparks (1977) reports that 69 percent of former "Special Studies" students passed with an average of D or better when they entered credit coursework.

The evaluation of developmental studies at Thomas Nelson Community College (Braxton et. al., 1980) is especially interesting in light of the findings of the present study because of the similarity in region, method and results of each. These researchers monitored the progress for three years of 1358 first-time developmental and nondevelopmental students. At the end of four quarters 63 percent of developmental students and 83 percent of nondevelopmentals had a GPA of 2.0 or above, much like what has been found here. Also consistent with the present study was the finding that though developmental students' mean GPA was below that of the others, it was above 2.0.

In the present study it was determined that 68 percent of developmental students earned 2.0 or better compared to

84 percent for others. Yet when the 1.0 range is included, the result is that 98 percent of developmental students passed and 99 percent of the others did so as well. The apparent contrast with the results reported by others above has to be expected, however. In those reports GPAs were reported for all students, while in the present one GPA distributions were sought only for students who had completed at least 15 credits. It will be recalled that in this study it was decided to limit the analysis in this way because of a concern that GPAs representing less than 15 credits would be insufficiently representative of the academic behavior being investigated. In consequence of this, a large percentage of the original sample (62 percent) was eliminated from analysis. On this basis, comparisons with studies which did not make this exclusion must be made cautiously. Relative to the other investigations that examined all students, the findings here must be adjudged inflationary.

The most revealing findings concerning developmental student grade performance, however, emerged from the analysis of overall mean GPA. Developmental students obtained a mean GPA that was significantly lower than that earned by nondevelopmentals. Yet when GPA was examined by increasing credit intervals, the GPA of developmental students was found to rise in linear fashion and eventually matched the GPA of their counterparts. Specifically, developmental students' GPA was a monotonically increasing

function in contrast to the flat function observed for nondevelopmental GPA. Importantly, this linear increase in developmental GPA cannot be attributed to comparatively higher attrition within this group since, in fact, a higher proportion of nondevelopmental students terminated their enrollment than did developmental students.

The finding here is important because it demonstrates that developmental students did not maintain substandard GPAs as they accumulated credits, but rather, as a group, they progressively "caught up" with nondevelopmentals in grade performance. Apparently, developmental students steadily improve in GPA as they earn more credits and eventually perform as well as other students.

Comparing the results obtained in this study with those reported by other researchers is limited by methodological differences in the various approaches. In general, however, the findings of other reports are convergent with those reported here. Craig (1975), studied developmental student progress over a six quarter interval at three urban community colleges in Virginia. She found the combined colleges' GPA at the end of six quarters to be 1.89 for developmental students and 2.46 for nondevelopmentals, a result very much in line with the findings here (1.97 and 2.46, respectively). In contrast are the more favorable results reported by Donovan (1977) which indicate the outcome of an evaluation for a special program for high risk students at Southeastern Community College. At the end of

one year, students in an intensive developmental program had an average of 2.36, while others obtained an overall GPA of 2.54.

In summary, the results of this study indicate that, on average, students who initially enroll in at least one developmental studies course can and do overcome initial deficits and eventually perform as well as other students.

However, for students who enroll in more than one developmental course, this pattern was not maintained. The effect of enrollment in more than one developmental course on GPA was found to be significant and specifically indicated an inverse relationship between the number of these courses and GPA. Apparently, as initial needs for developmental courses increase, the likelihood of academic success (i.e. good academic standing and progress toward graduation) is reduced.

This has implications for the results reported on GPA performance for the students enrolled in only one developmental course. The effect of the comparably lower GPA obtained by the students enrolled in two or more developmental courses (42 percent of developmental students) served to depress the overall mean GPA for developmental students. This means that, on average, students enrolled in one developmental course not only matched the grade performance of their nondevelopmental colleagues, but they eventually surpassed it.

The result of the additional GPA analysis on the number of developmental courses taken is also important because it

suggests that while developmental studies courses are effective for students with specific weaknesses, they are much less so for students with generalized academic deficiencies. It supports the hypothesis that students enrolled in two or more developmental courses share distinct and unique needs which may not be consistent with the needs of students who require only a brief refresher course.

This indication, however, is not consistent with findings reported elsewhere which describe outcomes for students who complete developmental programs. A report by Donovan (1977) which reviewed ten exemplary programs for such students reveals solid evidence for the subsequent success of these students when they move into credit course work. And Sparks (1976) reports that these developmental students did as well as others in their post-developmental coursework.

Successful programs for lesser prepared students are characterized primarily by the high degree of support they provide to their students on a systematic basis. While it should remain clear that developmental education had a positive impact on the academic performance of the subjects in this study, changes may be needed at the institution studied here to strengthen the program as it serves students with more generalized academic deficiencies. New efforts, initiated within the college, to establish interventions based on a holistic model that emphasizes affective and behavioral growth of students would improve the outcomes for

those who enter college without the basic skills and understandings required for success.

Developmental English Comparisons

In general, developmental English students at this institution who took college English performed less well than their nondevelopmental colleagues, yet a substantial majority of them did earn a grade of C or better. When considered in light of the remarkably compatible findings obtained in similar studies conducted elsewhere, these results reflect favorably upon the effectiveness of the college's developmental English program. With respect to overall averages obtained by developmental students in college English, Linthicum (1979), in her study encompassing half of Maryland's community colleges, reports a mean GPA of 2.0. In contrast, nondevelopmentals earned a 2.7 GPA. This compares easily with the results obtained here, where developmentals earned 1.9 and others, 2.3. Likewise, Braxton et. al. (1980) report that at Thomas Nelson Community College developmental students earned a mean GPA of 1.9.

The most telling results, however, have to do with the percentage of developmental students who passed credit English. It will be recalled that in this study 82 percent did so, 68 percent with a C or better. The respective figures for nondevelopmental students were 82 percent and 84 percent. While fewer developmental students than others received As and Bs, as would have been expected, the finding

that so large a percentage passed suggests that developmental English students rapidly improved writing ability in a relatively brief period of time.

Notably, other studies report results which parallel those obtained here. Whittle (1980) found that 71 percent of developmental students passed college English and 65 percent did so with a C or better. At another Virginia community college, Braxton et. al. (1980) report respective percentages of 85 percent and 68 percent. And, in the Maryland study of community colleges, Linthicum (1979) ascertained that 75 percent of developmental students earned at least a C (85 percent passed) while among nondevelopmentals 91 percent did so (96 percent passed).

One problem evident in these reports and in the results of the present inquiry is that while substantial percentages of developmental students pass college English, when the C or better grade criterion is applied, proportionally fewer developmental students are successful than is the case with nondevelopmentals. The D grade criterion is a much less meaningful indicator of success because, on average, such grades fall below the C average required for graduation. As well, courses in which D grades have been earned are not normally accepted for transfer by other institutions.

Overall, the findings in this study are in accord with those of similar studies which indicate that 65-75 percent of developmental English students are able to pass credit English with at least a C grade. On the basis of this

criterion, the developmental English program at this institution may be said to be as effective as others in preparing students for success in credit English. Substantial numbers of students who enter college with insufficient verbal skills are able, through developmental coursework, to complete college English.

Context and Theoretical Implications of this Study

This study has been undertaken in several important contexts. The need for remediation among community college students appears to be growing while clear and effective program strategies remain elusive. Tension is increasing between the commitment to provide a college education to everyone who wants it and the need to maintain appropriate academic standards. Public concerns about accountability have grown as have those of state agencies which threaten to increase control over or to abolish developmental programs. And more specific to this study, the State Council of Higher Education for Virginia has criticized the lack of evaluation of college remedial programs and has moved to ensure that it occurs in the future.

Within these contexts this exploratory study has aimed to characterize the developmental program at one college, and to indicate benchmarks of program effectiveness that may serve as points of departure for more discerning research in the future. While this study does not show the degree of impact of developmental studies, the findings do support the rationale for remedial education in the community college.

Indeed, a crucial theoretical issue underlying this investigation and related ones reviewed above is whether or not academic deficiencies can, in fact, be remediated at the college level. Developmental education programs have proliferated under an apparent assumption that the causes of insufficient achievement prior to college enrollment can be redressed there. This view, however, is in opposition to another prevalent one, the cumulative deficit hypothesis which was the basis for preschool and headstart programs. That viewpoint holds that the longer deficiencies are permitted to exist, the less likely remediation will be to work (Losak, 1973).

Notwithstanding the influence of some temporal relationship as expressed in that hypothesis, the results of this study and others relevant to developmental education demonstrate that significant and sufficient gains can be obtained in college with underprepared students who are beyond high school age. At the root of the clear successes reported by college remedial programs is an emphasis on new approaches and educational strategies intended to promote accelerated cognitive and affective development of students. These include expanded diagnostic and placement testing, counseling, mastery learning, self-paced modules, programmed instruction, computer assisted instruction, study skills development, career exploration and planning and interpersonal skills development. The attempt to compensate in college for prior lack of academic achievement remains a

controversial enterprise because of the paucity of well-designed remedial programs and the ambiguity of research evaluations of them (Cross, 1976). In addition, there continues to be disagreement concerning the relative contributions of general intellectual ability, social class background and the mass public education experience itself to the phenomenon of the underprepared student.

Remediation in colleges is, of course, neither appropriate nor possible for everyone. Those who lack capacity to learn the concepts and skills required in higher education commonly find only frustration and failure in seeking a college degree. Such persons, however, are a small minority among the underprepared students who enroll in college each term. From what is known about the role of academic ability as a "cause" of low achievement, we can draw two conclusions. According to Cross (1976):

1. Academic ability is an important variable in the time required for learning traditional academic subject matter.
2. A very large proportion (85-90 percent) of the population can learn traditional subject matter, given appropriate time and treatment. We can probably assume that anyone who has made it to college can, with varying amounts of individual and institutional effort, master the college curriculum.

In summary, the results of this study support a positive appraisal of the potential for remediation in fundamental skills at the college level. At issue really is not so much whether underprepared students entering college can be equipped for success in curricular programs, but whether enough can be to justify the necessary commitments

of society's limited resources for this kind of education. This is essentially an issue of educational and social policy.

Policy Issues

A policy of open-access has been fundamental to the community college. The intention of this policy, born of efforts to universalize postsecondary education, has been to expand educational opportunities by ensuring that any citizen who desires to go to college may enroll. Its promotion has been based on the assumption that equalization of access to postsecondary education would provide new avenues for occupational and social mobility to those excluded under a meritocratic system.

As we have seen, with the advent of this policy in the 1960s, there was a burgeoning of community college enrollments largely made up of groups previously underrepresented in higher education. Among the many non-traditional students new to college, were large numbers of students who lacked the fundamental academic skills required to succeed. The considerable expenditure of human talent and financial resources which has yet produced only qualified successes attests to the enormous challenge inherent in the task of promoting the success of many of these students. And while many students have passed only through a "revolving door," certainly there are many others for whom the open door has served its ideal purpose. On the basis of current evidence it is clear that community

colleges continue to enroll large numbers of underprepared students and that these students remain in college at least as long, if not longer than their more able colleagues.

The success of the open door policy, however, has primarily been in facilitating access to college for targeted groups. Indeed, impressive numbers of students have enrolled under its aegis, resulting in a widening of access as intended. Nonetheless, if access is interpreted as the percentage of the population qualified for advanced study or new employment as a result of completing an appropriate educational program, estimates of success become more problematical (Richardson, 1983). Indeed, where it is even possible to analyze graduates of two-year college programs, we find that while developmental students may be persistent in school, proportionally fewer of them graduate than others (Braxton et. al., 1980). And for minorities the implications of this are especially disturbing. In the view of Olivas (1979):

It is undeniable that minority students have increased their access into higher education, if one defines access as 'ability to get into some college, somewhere.' However, the necessary corollary of access - distribution - is strikingly skewed against minority students and raises a prima facie assumption of inequitable distribution within the system.

Clearly, access has not necessarily meant opportunity.

Nonetheless, growing concern has been expressed by policy-makers, educators and citizens about the educational, social and economic consequences of maintaining a policy of unlimited access to college. The high costs associated with

remedial college programs and misgivings about the capacity of the open enrollment model to produce the desired outcomes (e.g. graduates, new employment), have now invited new policies that would limit access.

One policy option currently gaining favor (and being implemented in selected community colleges) involves an increased emphasis on pre-testing and evidence of academic progress as a requirement for students' continued enrollment. Stricter academic standards, it is maintained, would motivate many students to perform in a way more consistent with their potential. The number and quality of graduates would improve along with other measures of success. Students unwilling to, or unable to demonstrate the required academic progress would be denied readmission.

In connection with this, Richardson (1983) in a cogent article, calls for a reexamination of community college policy decisions of the seventies, maintaining that "...many community colleges are now operating under policies which increasingly appear out of synchronization with public concerns about student achievement and program quality." In the context of Wildavsky's (1979) twin contentions that education will not significantly improve students' life chances and that institutions transform their current objectives into more achievable new ones, Richardson documents the relevant recent work of the community college:

From achievement in college transfer or career programs, the emphasis shifted to lifelong learning. For underprepared students the focus changed from attempting to remedy academic skills to improving

students' self concepts....In the process of changing clientele and objectives, community colleges moved from the core societal concerns of equality and social mobility toward the periphery of providing courses for individual satisfaction.

Evidence of this and of the impact on remedial student populations is apparent in other policy changes of the seventies. Financial assistance programs now limit access by restricting aid to only those who are actual degree candidates and by imposing time limits on completion. Standardized measures are increasingly used to determine progress and to eliminate those students who are unable to measure up. And, newer "developmental" programs which emphasize self-concept and study skills broaden the range of students who can participate, thus de-emphasizing a focus on academic skills necessary for achievement (Richardson, 1983).

Notwithstanding this subtle redefinition of access, community colleges over the past ten years have generally continued to gravitate toward the student access/increasing enrollments end of the policy continuum, Richardson maintains. He argues that the time has come to revise this trend, citing the favorable experiences of the few colleges that have been willing to accept reduced enrollments in exchange for improved achievement among students who remain. He concludes "...Some may have to fail or even be excluded if higher education is to remain an avenue of social mobility for the academically unprepared."

As tempting as this assessment is, it presents a major problem. Primarily, it assumes a diminution of the relative

importance of the remedial function of the community college that is not acceptable. Community college education remains the "last chance" for many in our society to obtain post-secondary education. For many students there are few alternatives to postsecondary education but undesirable ones -- unemployment, crime, welfare. While the past record of success with underprepared students is certainly uneven, there is evidence enough that remedial programs can work to warrant their continued support and enhancement. Indeed it has only been relatively recently that community colleges have begun to effectively organize remedial programs, and to "own" this concept. A development of relevant teaching technology is now underway, a body of developmental education-related literature is growing and new graduate programs now prepare future teachers in this specialty. Policy decisions are needed that will facilitate the integration of "success formulas" into a wider variety of currently existing programs. Higher expectations for student progress are needed, but are not inconsistent with highly effective remedial programs designed to serve the broadest segment of the population seeking a college education.

Policy decisions that limit access add credence to the assessment of community college critics who say that these institutions serve a disguised purpose -- to maintain the social status quo through the creation of illusory upward mobility (Zwerling, 1976). Specifically, community colleges

are accused of exacerbating the weeding out process commonly known as "cooling out." While this process necessarily occurs to some extent in the interplay of aspirations, opportunities and resources, it is the insidious intentionality ascribed to its use by critics that is so disturbing. Reflecting this, Clark (1960), long ago said about the "cooling out" process:

Should the function become obvious, the ability of the junior college to perform it would be impaired. The realization that the junior college is a place where students reach undesired destinations would turn the pressure for college admissions back on the "protected" colleges. The widespread identification of the junior college as principally a transfer station, aided by the ambiguity of the "community college" label, helps keep this role reasonably opaque to public scrutiny.

Policies that would restrict access to college threaten to undermine a recently won national commitment to wider educational opportunities for all and in the process to damage the aspirations of, and otherwise harm the life possibilities for generations of future citizens.

The results of this study underscore the importance of the developmental/remedial mission of the community college to the maintenance of a system of open access to higher education. Nearly a third of the students enrolled at the institution studied here are served through this function and for many among those served the community college represents the only viable alternative for obtaining postsecondary education. These students tend to persist in school and ultimately perform as well as other students do in college coursework. A rededication to the goals of

developmental education coupled with a new commitment to program development and evaluation promise to increase the probability of college success for many of these students, and especially for the least academically able ones among them.

Limitations

The findings of this study, while broadly representative of urban multicampus community colleges, may be generalized only with caution. Urban community colleges vary widely on a number of important dimensions with which this study was concerned. In particular, many such colleges are located in inner city areas in contrast to the more suburban settings of the institution studied here. Because of this, many other colleges enroll higher proportions of minority, unemployed or poor students. The wide variability in attributes of community college student populations serves to limit the applicability of the results obtained here to colleges with similar student populations.

One possible outcome of enrollment in developmental studies that is not amenable to detection in this study concerns secondary gains. Students may have acquired unintended benefits from developmental courses (e.g. confidence, interpersonal skills) quite unrelated to course content that, if obtained early enough, might have influenced subsequent persistence and grade performance.

The use of grades as an indicator of academic success is a limitation due to the susceptibility of this phenomenon

to the influence of a variety of factors (e.g. student appearance, teacher personality). In the present study, however, the subjectivity associated with grades was minimized because multiple measures on student performance were taken. Eliminating subjects with fewer than fifteen credits insured that resultant GPAs were the product of at least four or five courses.

In addition to this measure of quality provided by grades, a measure of quantity was introduced in the persistence inquiry. By restricting the persistence investigation to the number of quarters competed, however, information concerning the sequencing of enrollments could not be analyzed.

While sample size is an overall strength of this study, another limitation is that different subsamples had to be utilized in the separate analyses. As well, the original sample was reduced substantially in several of those analyses. The persistence exploration examined only curricular students, excluding a large subset of the sample. And the GPA investigation, by limiting attention only to the grade performance of students with fifteen or more credits, eliminated consideration of a substantial segment of the original sample. Notwithstanding this, the reductions in sample size were considered essential in making the measures meaningful.

Directions for Future Research

This exploratory study provides a framework for consideration of future research concerning developmental

studies. Such research will be necessary both to substantiate the effectiveness of developmental education and to improve it. On this basis the following recommendations are given.

- 1) As a first priority, future research should attempt to determine the actual impact of developmental studies on subsequent college success through the utilization of experimental designs that employ appropriate controls.
- 2) Longitudinal comparative studies need to be undertaken which examine the academic outcomes for students who do not complete developmental courses and for those students who choose not to enroll in recommended developmental coursework.
- 3) Of critical importance is the need for further investigation of the factors which may explain the inverse relationship found in this study between the number of developmental courses taken and GPA. Swift institutional responses are called for regarding this in terms of innovative interventions in counseling and instruction as well as in systematic monitoring of student performance.
- 4) Follow-up studies are required which examine long-term outcomes for developmental students. Especially important to consider in this regard are the comparative graduation rates obtained by developmental students and subsequent occupational attainments.
- 5) Measures of developmental student satisfaction with counseling and instruction are needed to promote an optimal "fit" between program goals and students' experiences.

Summary and Conclusions

The purpose of this study was to examine the effectiveness of developmental/remedial education at an urban multi-campus community college. The study sought (1) to identify the number and demographic characteristics of students served by developmental studies; (2) to determine the academic achievement and persistence of these students; and (3) to assess the performance of developmental English students in regular college English.

Data were obtained for a two year period on all new students who enrolled in the fall of 1980. The study employed two approaches: (1) a descriptive analysis of the variables of age, sex, race, enrollment status and day/night attendance; (2) a static group comparison to detect differences in performance in college English, in cumulative grade point average, in credits completed and in the number of quarters attended between developmental and other students.

The descriptive analysis revealed that 1) slightly more than one-fourth of new students enrolled in a developmental course; 2) developmental students were likely to be younger, male, and to attend full-time during the day; and 3) the large majority of developmental students was white, although non-whites were overrepresented.

Full-time developmental students were found to complete as many quarters of enrollment as other full-time students and part-time developmental students completed a

significantly higher number of quarters than did part-time nondevelopmental students.

Developmental students' mean GPA was significantly lower than the GPA of others. When examined by increasing intervals of credits earned, however, developmental students' GPA increased in linear fashion and eventually surpassed that of nondevelopmental students. For students enrolled in more than one developmental course this pattern did not obtain. An inverse relationship was found between the number of developmental courses and grade point average.

Students who completed a developmental English course performed less well in college English than other students, yet a substantial majority (68 percent) was able to pass the course with at least a grade of C.

Overall the findings of this study support the rationale for remedial education in the community college. The program studied here serves a large number of students who are relatively persistent in school and who progress satisfactorily toward graduation. Distinctly different patterns of academic achievement were found for students with specific versus generalized academic deficiencies. This finding is inconsistent with results reported in similar research reports and indicates that additional resources are needed to make the developmental education program effective for all groups.

Students who are admitted to college deserve an educational program that offers realistic possibilities for academic success. Improvements in the developmental studies program are required to meet the unique needs of all students who are encouraged to enroll under a policy of open access.

REFERENCES

Books

- Astin, A. W. Preventing Students from Dropping Out. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1975.
- Bowles, S. and Gintis, H. Schooling in Capitalist America. New York: Basic Books, 1976.
- Bushnell, D. S. Organizing for Change: New Priorities for Community Colleges. San Francisco, CA: McGraw-Hill Book Company 1973.
- Carnegie Commission on Higher Education. New Students and New Places. New York: McGraw-Hill, 1971.
- Clark, Burton R. Open Door College: A Case Study. New York: McGraw-Hill, 1960.
- Cohen, A. M. and Associates. College Responses to Community Demands. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1977.
- Cook, Thomas D. and Campbell, Donald T. Quasi-Experimentation: Design and Analysis Issues for Field Settings. Boston: Houghton Mifflin Co., 1979.
- Cross, K. P. Accent on Learning. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1976.
- Cross, K. P. Beyond the Open Door. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1971.
- Cross, Patricia K. "The Impact of Changing Student Populations of Community Colleges," Community College Review, Vol. 10 No. 4, Spring, 1983.
- Decker, A., Jody, R. and Brings, F. A Handbook on Open Admissions. Boulder, Colorado: Westview Press, 1976.
- Gleazer, Edmund J. Project Focus: A Forecast Study of Community Colleges. New York: McGraw-Hill, 1973.
- Jencks, C. et.al. Inequality: A Reassessment of Family and Schooling in America. New York: Basic Books, 1972.
- Jencks, C. and Riesman, D. The Academic Revolution. New York: Doubleday and Company, Inc., 1968.
- Kerlinger, F. N. Foundations of Behavioral Research, 2nd ed. New York, NY: Holt, Rinehart and Winston, Inc., 1973.

- Knoell, D. M., (ed.) Understanding Diverse Students: New Directions for Community Colleges. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Lavin, D. E., Alba, R. D., Silberstein, R. A. Right Versus Privilege: The Open Admissions Experiment at the City University of New York. New York: The Free Press, 1981.
- Medsker, L. L. and Tillery, D. Breaking the Access Barriers: A Profile of Two-Year Colleges. San Francisco, CA: McGraw-Hill Book Company, 1971.
- Monroe, C. R. Profile of the Community College. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Moore, W., Jr. Against the Odds. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1970.
- Moore, W., Jr. Community College Response to the High-Risk Student: A Critical Appraisal. Washington, D. C.: American Association of Community and Junior Colleges, 1976.
- Mulka, M. and Sherrin, E. An Evaluation of Policy Related Research on Postsecondary Education for the Disadvantaged. Washington, D. C.: National Science Foundation, 1968.
- Olivas, Michael A. The Dilemma of Access: Minorities in Two-Year Colleges. Washington: Howard University Press, 1979.
- Roueche, J. E. and Kirk, R. W. Catching Up: Remedial Education. San Francisco, CA: Jossey-Bass, Inc. Publishers, 1973.
- Roueche, J. E. and Pitman, J. C. A Modest Proposal: Students Can Learn. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Roueche, J. E. and Snow, J. J. Overcoming Learning Problems. San Francisco, CA: Jossey-Bass, Inc. Publishers, 1977.
- Tidewater Community College. 1980-81 Catalog. Portsmouth, VA.
- Trillin, A. S. and Associates Teaching Basic Skills in College. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1980.
- Wildavsky, Aaron. Speaking Truth to Power: The Art and Craft of Policy Analysis. Boston: Little, Brown and Company, 1979.

Willingham, W. W. Free-Access Higher Education. New York, NY: College Entrance Examination Board, 1970.

Zwerling, S. L. Second Best: The Crisis of the Community College. New York: McGraw-Hill, 1976.

Articles, Papers, Reports, Misc.

An annotated bibliography of books, ERIC documents, and journal articles on nontraditional education in community/junior colleges. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1977, 7 pp.

An annotated bibliography of ERIC documents on student attrition/retention: A brief prepared especially for the California community/junior college association conference. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1980, 12 pp.

Braxton, P. C., Douthat, S. G., Hale, D. A., Lawson H. C., Safko, G. M., and Sims, D. C. Developmental studies program evaluation and student follow-up, 1975-1977. Hampton, VA: Thomas Nelson Community College, 1980.

Carnegie Council on Policy Studies in Higher Education. A Summary of Reports and Recommendations. San Francisco, CA: Jossey-Bass, Inc. 1980, pp. 261-264.

Clowes, D. A. Community college program review: A model. Community College Review, Fall 1981, pp. 3-9.

Cohen, Arthur M. The Social Equalization Fantasy. Community College Review, Fall, 1977, pp. 74-82.

Colleges Offered 15 Pct. More Courses This Year Survey Finds; Remedial Classes Increase 22 Percent. Chronicle of Higher Education, June 1, 1981, pp. 1-8.

Cross, K. P. On Old Practices and New Purposes in Education. Paper presented to the Conference on Remedial and Developmental Mathematics in College: Issues and Innovations, New York City, April 1981.

Educational Policies Commission of the National Education Association. Universal Opportunity for Education Beyond the High School. Washington, D. C.: National Education Association, 1964.

Ernst, R. J. Developmental Education in Virginia. Report of the State Council of Higher Education for Virginia General Professional Advisory Committee meeting, Annandale, VA, January 1981.

- First-time Student Study. Office of Institutional Research, Tidewater Community College, July 1981.
- Friedlander, J. Why students drop courses. Junior College Resource Review, January 1981.
- Higher Education for American Democracy. Establishing the Goals: General Education. Washington, D. C.: Government Printing Office, 1947.
- Hill, A. Developmental education: Does it work? Community College Review, Spring 1978, pp. 41-47.
- Hunt, W. K. Retention Study. Report prepared by the Office of Institutional Research, Tidewater Community College, Portsmouth, VA, 1981.
- Jelfo, D. Developmental educational research in two-year junior colleges. Paper presented at the Second Annual Developmental Education Conference, Cleveland, October 1974.
- Kraetsch, G. A. The role of community colleges in the basic skills movement. Community College Review, Fall 1980, pp. 18-23.
- Losak, J. The Academically Underprepared Student. New Directions for Community Colleges, Autumn, 1973.
- Maryland State Board for Community Colleges. Remedial education in Maryland community colleges: fiscal year 1980 (Discussion copy). Report prepared for the November State Board meeting, Annapolis 1981.
- McCabe, R. H. Now is the time to reform the American community college. Miami-Dade Community College, March 1981, pp. 1-3.
- Office of Institutional Research. Non-returning student study, appendix A. Research report, Tidewater Community college, March 1980.
- Pantages, T. J., and Creedon, C. F. Studies of college attrition: 1950-1975. Review of Educational Research, Winter, 1978, pp. 49-101.
- Pascarella, E. T., and Terenzini, P. T. Interaction effects in Spady's and Tinto's conceptual models of college dropout. Sociology of Education, October 1979, pp. 197-210.
- Pascarella, E. T., and Terenzini, P. T. Predicting freshman persistence and voluntary dropout decisions from a theoretical model. Journal of Higher Education, 1980, 51(1), 60-75.

- Pezzullo, D. About student attrition/retention in the community college: A brief highlighting the literature since 1973 on community college students attrition/retention. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1978, 27 pp. (ED 160-179).
- President's Committee on Education Beyond High School. Second Report to the President. Washington, D. C.: Government Printing Office, 1957.
- Ragburn, W. G., and Hayes, E. J. Compensatory education: effective or ineffective? Journal of Counseling Psychology, 1975, 22(6), 523-528.
- Ramist, L. College student attrition and retention. Findings. 1981, VI(2), pp. 1-4.
- Richardson, Richard C. Jr. Open Access and Institutional Policy: Time for Reexamination. Community College Review. Vol.10 No. 4, Spring, 1983.
- Roueche, J. E. Accommodating individual differences. Community College Review, July-August 1973, pp. 24-29.
- Roueche, J. E. and Armes, N. R. Basic Skills Education: Point-Counterpoint. Community and Junior College Journal, March, 1980, p. 21.
- Roueche, J. E. and Boggs, J. R. Junior College Institutional Research. Washington, D. C.: American Association of Community and Junior Colleges, 1968.
- Roueche, J. E. and Clark, D. I. Compensatory Education: Toward a Holistic Approach. Community College Frontiers, Winter 1981, p. 36.
- Roueche, J. E., and Mink, O. G. Helping the "unmotivated" student: Toward personhood development. Community College Review, Spring 1976, pp. 40-50.
- Roueche, J. E., Mink, O. G., and Abbott, M. L. Effects of individualized instruction on control expectancy: A field test. Community/Junior Research Quarterly, 2:1978, 111-118.
- Sanchez, B. About community college remedial and developmental education; a brief highlighting important literature since 1968 about remedial and developmental education in the community college. Los Angeles: ERIC Clearinghouse for Junior Colleges, August 1977, 23 pp.
- Southern Regional Education Board. Colleges respond to decline: Resistance versus adaptation. Issues in Higher Education, No.17, 1981, pp. 1-8.

Tinto, V. Dropout from higher education: A theoretical synthesis of recent research. Review of Educational Research, Winter 1975, pp. 89-125.

Microforms

Bergman, I. 1976. A Five-Year Follow-up Study of Entering Fall 1970 Basic Skills Students at Queensborough Community College. (ERIC Document Reproduction Service No. ED 143 385).

Bergman, I. and R. Gerace. 1974. A Follow-up Study: How Do Basic Skills Students Compare with Non-Basic Skills Students in Some of Their Subsequent College Courses? (ERIC Document Reproduction Service No. ED 135 435)

Blai, G., Jr. 1972. Two-Year College Dropouts--Why Do They Leave? Who Are They? How Many? (ERIC Document Reproduction Service No. ED 058 879)

Cohen, A. M. and F. B. Brawer. 1970. Student Characteristics. Personality and Dropout Propensity. (ERIC Document Reproduction Service No. ED 038 130)

Compensatory/Developmental Programs in Texas Public Community Colleges: Report of a Survey. Austin: Texas College and University System Coordinating Board. 1975 (ERIC Document Reproduction Service No. ED 110 133)

Donovan, R. A. et al. 1977. The Final Report of National Project II: Alternatives to the Revolving Door. (ERIC Document Reproduction Service No. ED 151 054)

Grant, M. K. and D. R. Hoeber. 1978. Basic Skills Programs: Are They Working? (ERIC Document Reproduction Service No. ED 150 918)

Klingelhofer, E. L. and L. Hollander. 1973. Educational Characteristics and Needs of New Students: A Review of the Literature. (ERIC Document Reproduction Service No. ED 084 482)

Linthicum, D. S. 1979. Statewide Assessment of Developmental/Remedial Education at Maryland Community Colleges. Annapolis: Maryland State Board for Community Colleges (ERIC Document Reproduction Service No. ED 175 514)

Reap, M. C. and H. C. Covington. 1980. Evaluation of the Effectiveness of the Developmental Studies Program. (ERIC Document Reproduction Service No. ED 197 798)

- Rodwick, J. and M. J. Grady, 1976. The Second Change: A Summary Report. (ERIC Document Reproduction Service No. ED 119 179)
- Romoser, R C. 1978. Results of the Second Assessment Study of Developmental Education Programs in Ohio. Ohio Statewide Committee on Developmental Education. (ERIC Document Reproduction Service No. ED 157 587)
- Roueche, J. E. 1968. Salvage Redirection or Custody? (ERIC Document Reproduction Service No. ED 019 077)
- Schiavone, J. 1977. Effectiveness of Remedial Reading Courses in Upgrading Skills of Underprepared Students Who Entered Manhattan Community College Under the Open Admissions Policy. (ERIC Document Reproduction Service No. ED 134 284)
- Slark, J. 1978. Longitudinal Study of Student Flow and Persistence. (ERIC Document Reproduction Service No. ED 158 825)
- Snyder, F. A. and C. E. Blocker. 1970. Persistence of Developmental Students. (ERIC Document Reproduction Service No. ED 042 438)
- Sparks, J. R. and C. L. Davis. 1977. A Systems Analysis and Evaluation of a Junior College Developmental Studies Program. (ERIC Document Reproduction Service No. ED 136 892)

Dissertations

- Craig, J. 1975. An Assessment of the Effectiveness in Developmental Education Programs in Selected Urban Community Colleges in the Commonwealth of Virginia. Unpublished doctoral dissertation. Florida State University.
- Lesnick, H. M. 1980. A Study of the Effectiveness of the Developmental Program at Northern Virginia Community College's Annandale Campus. Unpublished doctoral dissertation. The George Washington University.
- Whittle, D. H. P. 1980. Success in Freshman English Preceded by Developmental English: Predicting Success Through Persistence and Selected Demographic Variables. Unpublished doctoral dissertation. The University of Virginia.

BIBLIOGRAPHY

Books

- Astin, Alexander W. Preventing Students from Dropping Out. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1975.
- Baird, Leonard L., (ed.) Assessing Student Academic and Social Progress: New Directions for Community Colleges. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1977.
- Bowles, S. and Gintis, H. Schooling in Capitalist America. New York: Basic Books, 1976.
- Bushnell, David S. Organizing for Change: New Priorities for Community Colleges. San Francisco, CA: McGraw-Hill Book Company, 1973.
- Campbell, Donald T. and Stanley, Julian C. Experimental and Quasi-Experimental Designs for Research. Chicago, IL: Rand McNally College Publishing Company, 1963.
- Carnegie Commission on Higher Education. The Open Door Colleges: Policies for Community Colleges. New York: McGraw-Hill, 1970.
- Carnegie Commission on Higher Education. New Students and New Places. New York: McGraw-Hill, 1971.
- Clark, Burton R. Open Door College: A Case Study. New York: McGraw-Hill, 1960.
- Cohen, Arthur M. and Associates. College Responses to Community Demands. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1971.
- Cross, K. Patricia. Beyond the Open Door. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1974.
- Cross, K. Patricia. Accent on Learning. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1976.
- Decker, A., Jody R. and Brings, F. A Handbook on Open Admissions. Boulder, Colorado: Westview Press, 1976.
- Gleazer, Edmund J. Project Focus: A Forecast Study of Community Colleges. New York: McGraw-Hill, 1973.
- Jencks, C. and Riesman, D. The Academic Revolution. New York: Doubleday and Company, Inc., 1968.

- Jencks, C. et. al. Inequality: A Reassessment of Family and Schooling in America. New York: Basic Books, 1972.
- Kerlinger, Fred N. Foundations of Behavioral Research, 2nd ed. New York, NY: Holt, Rinehart and Winston, Inc., 1973.
- Knoell, D. M. (Ed.) Understanding Diverse Students. San Francisco: Jossey-Bass, 1973.
- Knoell, Dorothy and McIntyre, Charles. Planning Colleges for the Community. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1974.
- Lavin, D. E., Alba, R. D., Silberstein, R. A. Right Versus Privilege: The Open Admissions Experiment at the City University of New York. New York: The Free Press, 1981.
- Martin, Roy. Writing and Defending a Thesis or Dissertation in Psychology and Education. Springfield, IL: Charles C. Thomas, Publisher, 1980.
- Medsker, Leland L. and Tillery, Dale. Breaking the Access Barriers: A Profile of Two-Year Colleges. San Francisco, CA: McGraw-Hill Book Company, 1971.
- Monroe, Charles R. Profile of the Community College. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Moore, William, Jr. Against the Odds. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1970.
- Moore, William, Jr. Community College Response to the High-Risk Student: A Critical Appraisal. Washington, D.C.: American Association of Community and Junior Colleges, 1976.
- Mulka, M. and Sherrin, E. An Evaluation of Policy Related Research on Postsecondary Education for the Disadvantaged. Washington, D. C.: National Science Foundation, 1968.
- Neale, John M. and Liebert, Robert M. Science and Behavior: An Introduction to Methods of Research. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1973.
- Noel, Lee, (ed.) Reducing the Dropout Rate. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1978.
- Olivas, Michael A. The Dilemma of Access: Minorities in Two-Year Colleges. Washington: Howard University Press, 1979.

- Palola, Ernest G. and Oswald, Arthur R. Urban Multi-Unit Community Colleges: Adaptation for the '70 s. Berkeley, CA: University of California Center for Research and Development in Higher Education, 1972.
- Pennington, Floyd C., (ed.) Assessing Educational Needs of Adults: New Directions for Continuing Education. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1980.
- Roueche, John E., (ed.) Increasing Basic Skills by Developmental Studies. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1977.
- Roueche, John E. and Kirk, R. Wade. Catching Up: Remedial Education. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Roueche, John E. and Pitman, John C. A Modest Proposal: Students Can Learn. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1973.
- Roueche, John E. and Snow, Jerry J. Overcoming Learning Problems. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1977.
- Siegel, Sidney, Nonparametric Statistics for the Behavioral Sciences. New York, NY: McGraw-Hill Book Company, 1956.
- Tidewater Community College. 1980-1981 Catalog. Portsmouth, VA.
- Trillin, Alice Stewart and Associates. Teaching Basic Skills in College. San Francisco, CA: Jossey-Bass, Inc., Publishers, 1980.
- Wildavsky, Aaron. Speaking Truth to Power: The Art and Craft of Policy Analysis. Boston: Little, Brown and Company, 1979.
- Willingham, Warren W. Free-Access Higher Education. New York, NY: College Entrance Examination Board, 1970.
- Zwerling, S. L. Second Best: The Crisis of the Community College. New York: McGraw-Hill, 1976.

Articles, Papers, Reports, Misc.

- Ainsworth, D. Examining the basis for competency-based education. Journal of Higher Education, May-June 1977, pp. 321-331.

- Anandam, K. Promises to keep...academic alert and advisement. Miami-Dade Community College, May 1981, pp. 1-6.
- An annotated bibliography of books, ERIC documents, and journal articles on nontraditional education in community/junior colleges. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1977, 7 pp.
- An annotated bibliography of ERIC documents on student attrition/retention: A brief prepared especially for the California community/junior association conference. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1980, 12 pp.
- Baker, G. A. III, and Reed, L. W., Jr. The nontraditional learner: An organizational perspective. Community College Review, Winter 1980, pp. 36-41.
- Blocker, C. E., and Bacon, J. N. The community college of the future: A balancing act between social and educational demands. Community College Review, Fall 1973, pp. 7-13.
- Boylan, H. Academic intervention in developmental education. Journal of Developmental and Remedial Education, Spring 1981, pp. 10-11.
- Braxton, P. C., Douthat, S. G., Hale, D. A., Lawson H. C., Safko, G. M., and Sims, D. C. Developmental studies program evaluation and student follow-up, 1975-1977. Hampton, VA: Thomas Nelson Community College, 1980.
- Callas, D. Assessment data, the academic system and evaluation of the placement process. Community College Review, Fall 1981, pp. 27-33.
- Carnegie Council on Policy Studies in Higher Education. A Summary of Reports and Recommendations. San Francisco, CA: Jossey-Bass, 1980, pp. 261-264.
- Carney, M., and Geis, L. Reading ability, academic performance, and college attrition. Journal of College Student Personnel, January 1981, pp. 55-59.
- Center for Developmental Education. Instruments for measuring cognitive and affective development among students. Appalachian State University. Second Edition.
- Chandler, T. A., and Dugorics, D. A. Sex differences in research on locus of control. Psychological Reports, 1977, pp. 41, 47-53.

- Clowes, D. A. Community college program review: A model. Community College Review, Fall 1981, pp. 3-9.
- Clowes, D. A. Form and function. Journal of Developmental & Remedial Education, 1979, 3(1), 2-3; 13.
- Clowes, D. A., and Levin, B. H. How do two-year colleges serve recent high school graduates? Community College Review, Winter 1980, pp. 24-35.
- Cohen, A. M. Letter to the editor. The Chronicle of Higher Education, July 6, 1981, p. 18.
- Cohen, A. M. The social equalization fantasy. Community College Review, Fall 1977, pp. 74-82.
- Cohen, Arthur M. The Social Equalization Fantasy. Community College Review, Fall 1977, pp. 74-82.
- Colleges offered 15 Pct. More Courses This Year Survey Finds; Remedial Classes Increase 22 Percent. Chronicle of Higher Education, June 1, 1981, pp.1, 8.
- Cooper, L. R. The preparation of teachers for developmental studies programs. Community College Review, Winter 1980, pp. 36-40.
- Cross, K. P. Community colleges on the plateau. Journal of Higher Education, 1981, 52(2), 113-123.
- Cross, K. P. On Old Practices and New Purposes in Education. Paper presented to the Conference on Remedial and Developmental Mathematics in College: Issues and Innovation, New York City, April 1981.
- Cross, Patricia K. "The Impact of Changing Student Populations on Community Colleges," Community College Review, Vol. 10, No. 4, Spring, 1983.
- Currie, S. R. Referring community college students to the reading program. Journal of Reading, February 1978, pp. 409-415.
- Educational Policies Commission of the National Education Association. Universal Opportunity for Education Beyond the High School. Washington, D. C.: National Education Association, 1964.
- Engelberg, Stephen, "Robb Urges Change in College System," The Virginian-Pilot, March 26, 1982, pp. 1,4.
- Epstein, S. The self-concept revisited or a theory of a theory. American Psychologist, May 1973, pp. 404-416.

- Ernst, R. J. Developmental Education in Virginia. Report of the State Council of Higher Education for Virginia General Professional Advisory Committee meeting, Annandale, VA, January 1981.
- Finch, A. J., Jr., Kendall, P. C., Spirito, A., and Mikulka, P. J. Multidimensionality of the Nowicki-Strickland locus of control scale for adults. Journal of Personality Assessment, 1981, 45(2), pp. 151-154.
- First-time Student Study. Office of Institutional Research, Tidewater Community College, July 1981.
- Friedlander, J. Why students drop courses. Junior College Resource Review, January 1981.
- Furcron, M. Setting up a tutoring program. Journal of Developmental & Remedial Education, Spring 1980, pp. 27-29.
- Glass, J. C., Jr., and Hoffman, L. M. Learning disabilities in adults. Community College Review, Summer 1976, pp. 27-35.
- Griffin, J. M. Underachieving students in community colleges: Common personality and biographical characteristics. Community College Review, Fall 1980, pp. 15-19.
- Guide for Preparation of Theses and Dissertations. School of Graduate Studies, Old Dominion University, June 1981.
- Hammons, J. O., and Lyon, M. Critical decision areas in planning for nontraditional students. Community College Frontiers, Spring 1977, pp. 53-58.
- Harper, H., Herrig, J., Kelly, J. T., and Schinoff, R. B. Advisement and graduation information system. Miami-Dade Community College, March 1981, pp. 1-3.
- Helm, P., Chand, S., and Anasinis, L. Comprehensive developmental education: A research model. Paper presented at the Eighth National Developmental Education Conference, Little Rock, April 1981.
- Helms, J. E., and Giorgis, T. W. A comparison of the locus of control and anxiety level of African, black American, and white American college students. Journal of College Student Personnel, November 1980, pp. 503-509.
- Henderson, C. Retention improvement: Selected case studies. NASPA Forum, May 1981, pp. 3-4.
- Herrscher, B. R. Designing instruction. New Directions for Higher Education, Winter 1977, pp. 41-50.

- Hersch, P. D., and Scheibe, K. E. Reliability and validity of internal-external control as a personality dimension. Journal of Consulting Psychology, 1967, 31(6), 609-613.
- Hertz, S. Z., Gold, B. K., Kaufman, L. J., and Wallach, M. G. Credit for remedial courses? Community College Review, Summer 1977.
- Higher Education for American Democracy. Establishing the Goals: General Education. Washington, D. C.: Government Printing Office, 1947.
- Hill, A. Developmental education: Does it work? Community College Review, Spring 1978, pp. 41-47.
- Hudgens, A. G. Implications of hemisphericity for remedial programs. Community College Review, Winter 1980, pp. 15-23.
- Hunt, W. K. Retention study. Report prepared by the Office of Institutional Research, Tidewater Community College, Portsmouth, VA, 1981.
- Iredell, N. J., and Parsons, J. Should English teachers allow student dialects? Community College Review, Summer 1977, pp. 44-47.
- Jelfo, D. Developmental educational research in two-year junior colleges. Paper presented at the Second Annual Developmental Education Conference, Cleveland, October 1974.
- Jones, J. D., and Osborne, T. An educational support program: The results of merging academics and student personnel services. Journal of College Student Personnel. July 1977, pp 251-254.
- Kelly, J. T. Restructuring the academic program: A systems approach to educational reform at Miami-Dade Community College. Miami-Dade Community College, April 1981, pp. 1-4.
- Kraetsch, G. A. The role of community colleges in the basic skills movement. Community College Review, Fall 1980, pp. 18-23.
- Legare, T. L. Evaluating educational programs when experimental design is inappropriate. Educational Research Quarterly, Summer 1980, pp. 39-49.
- Lieberman, J. E., and Millonzi, J. C. Institutional change: Four factors of reform. Community College Frontiers, Spring 1979, pp. 47-49.

- Light, R. J. Evaluation methodology for education programs with diffuse goals: applications to extension evaluation. Education and Urban Society, 13(1), pp. 109-134.
- Lightfield, E. T. They do come back! Another view of student attrition. Community College Frontiers, Spring 1975, pp. 45-49.
- Losak, J. The Academically Underprepared Student. New Directions for Community Colleges, Autumn, 1973.
- Marion, P. Basic skills competency testing programs in multi-campus systems. Journal of Developmental & Remedial Education, Winter 1980, pp. 26-27.
- Marshak, Robert E. Open Access, Open Admissions, Open Warfare, Change, 13:8, November/December, 1981.
- Maryland State Board for Community Colleges. Remedial education in Maryland community colleges: fiscal year 1980 (Discussion copy). Report prepared for the November State Board meeting, Annapolis, 1981.
- McCabe, R. H. Now is the time to reform the American community college. Miami-Dade Community College, March 1981, pp. 1-3.
- McCabe, R. H. Why Miami-Dade Community College is reforming the educational program. Miami-Dade Community College, March 1981, pp. 1-3.
- Miles, C. The 4th "R" revisited. Journal of Developmental & Remedial Education, Fall 1981, pp. 2-4.
- Mink, O. G., and Watts, G. E. Reality therapy and personalized instruction: A success story. Community/Junior College Research Quarterly, 1:1977, pp. 389-396.
- Morgan, R. F., and Culver, V. I. Locus of control and reading achievement: Applications for the classroom. Journal of Reading, February 1978, pp. 403-407.
- Nelsen, E. A. and Uhl, N. P. A factorial study of the attitude scales on the college student questionnaire with students at a predominantly black university. Multivariate Behavioral Research, October 1974, pp. 395-405.
- Newlon, L. L., and Gaither, G. H. Factors contributing to attrition: An analysis of program impact on persistence patterns. College and University, Spring 1980, pp. 237-251.

- Nowicki, S., Jr., and Duke, M. P. A locus of control scale for noncollege as well as college adults. Journal of Personal Assessment, 1974, 38(2), 136-137.
- O'Banion, T. Innovations in humanistic education. Community College Review, Winter 1978, pp. 21-27.
- Office of Institutional Research. Non-returning student study, appendix A. Research report, Tidewater Community College, March 1980.
- Pantages, T. J., and Creedon, C. F. Studies of college attrition: 1950-1975. Review of Educational Research, Winter 1978, pp. 49-101.
- Pascarella, E. T., and Terenzini, P. T. Interaction effects in Spady's and Tinto's conceptual models of college dropout. Sociology of Education, October 1979, pp. 197-210.
- Pascarella, E. T., and Terenzini, P. T. Predicting freshman persistence and voluntary dropout decisions from a theoretical model. Journal of Higher Education, 1980, 51(1), pp. 60-75.
- Peng, S. S. Trends in the entry to higher education: 1961-1972. Educational Researcher, January 1977, pp. 15-19.
- Pezzullo, D. About student attrition/retention in the community college: A brief highlighting the literature since 1973 on community college students attrition/retention. Los Angeles: ERIC Clearinghouse for Junior Colleges, 1978, 27 pp. (ED 160 179)
- President's Committee on Education Beyond High School. Second Report to the President. Washington, D. C.: Government Printing Office, 1957.
- Project Intertwine. Faculty-Counselor Collaboration in the Developmental Classroom: A How-To Manual. Manassas, VA: Northern Virginia Community College, 1981.
- Ragburn, W. G., and Hayes, E. J. Compensatory education: effective or ineffective? Journal of Counseling Psychology, 1975, 22(6), 523-528.
- Ramist, L. College student attrition and retention. Findings, 1981, VI(2), pp. 1-4.
- Richardson, Richard C. Jr. 'Open Access and Institutional Policy: Time for Reexamination. Community College Review, Vol. 10, No. 4, Spring, 1983.

- Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80(1), 258-291.
- Roueche, J. E. Accommodating individual differences. Community College Review, July-August 1973, pp. 38-43.
- Roueche, J. E. Affective development in the classroom. Community College Review, Summer 1977, pp. 38-43.
- Roueche, J. E. Egalitarianism in college: Problems and solutions. Unpublished paper, University of Texas, 1981.
- Roueche, J. E. and Armes, N. R. Basic Skills Education: Point-Counterpoint. Community and Junior College Journal, March, 1980, p. 21.
- Roueche, J. E. and Boggs, J. R. Junior College Institutional Research. Washington, D. C.: American Association of Community and Junior Colleges, 1968.
- Roueche, J. E. and Clark, D. I. Compensatory Education: Toward a Holistic Approach. Community College Frontiers, Winter 1981, p. 36.
- Roueche, J. E., and Mink, O. G. Helping the "unmotivated" student: Toward personhood development. Community College Review, Spring 1976, pp. 40-50.
- Roueche, J. E., Mink, O. G., and Abbott, M. L. Effects of individualized instruction on control expectancy: A field test. Community/Junior Research Quarterly, 2:1978, 111-118.
- Roueche, J. E., Mink, O. G., and Armes, N. Coaching against helplessness in the classroom. Community and Junior College Journal, May 1981, pp. 36-38.
- Sanchez, B. About community college remedial and developmental education; a brief highlighting important literature since 1968 about remedial and developmental education in the community college. Los Angeles: ERIC Clearinghouse for Junior Colleges, August 1977, 23 pp.
- Snow, J. J. Counseling the high-risk student. New Directions for Higher Education, Winter 1977, pp. 1-21.
- Southern Regional Education Board. Colleges respond to decline: Resistance versus adaptation. Issues in Higher Education, No. 17, 1981, pp. 1-8.
- Spann, M. G., Jr. Building a developmental education program. New Directions for Higher Education, Winter 1977, pp. 23-39.

- Tinto, V. Dropout from higher education: A theoretical synthesis of recent research. Review of Educational Research, Winter 1975, pp. 89-125.
- Vriend, J., and Dyer, W. W. Schools fail to promote student self-development: The case for deliberate psychological education. Educational Technology, December 1976, pp. 7-15.
- Watcke, R. R. The urban community development college. Community College Review, Spring 1982, pp. 14-17.
- Wheeler, J. H. The Manassas connection: A teaming up in developmental studies. VASPA Interchange, Fall 1977, pp. 12-19.
- Williams, R. L. What are we learning from current programs for disadvantaged students? Journal of Higher Education, 1969, pp. 274-285.
- Willner, J. Identifying concerns and potential dropouts among community college freshmen. NASPA Journal, 1979, pp. 47-53.
- Wilson, R. C., Davis, F. D., and Davis, J. C., Sr. The success of high school diploma and GED equivalency students in vocational programs at Lake City Community College, Florida. American Council on Education Research Brief, Winter 1982, pp. 10-11.

Microforms

- Bergman, I. 1976. A Five-Year Follow-up Study of Entering Fall 1970 Basic Skills Students at Queensborough Community College. (ERIC Document Reproduction Service No. ED 143 385)
- Bergman, I. and R. Gerace. 1974. A Follow-up Study: How Do Basic Skills Students Compare with Non-Basic Skills Students in Some of Their Subsequent College Courses? (ERIC Document Reproduction Service No. ED 135 435)
- Blai, B., Jr. 1972. Two-Year College Dropouts--Why Do They Leave? Who Are They? How many? (ERIC Document Reproduction Service No. ED 058 879)
- Bourn, K. 1978. Self-Concept Development for High-Risk Students in the Community College. (ERIC Document Reproduction Service No. ED 153 681)
- Brown, R. H. and J. T. Kapes. 1973. A Longitudinal Study of the Level of Occupational Aspirations Youth Over the High School Years. (ERIC Document Reproduction Service No. ED 084 433)

- Capoor, M. and N. Eagle. 1979. Dropouts in Two-Year Colleges: Better Prediction with the Use of Moderator Subgroups. (ERIC Document Reproduction Service No. ED 184 636)
- Carter, L. G. 1976. Developmental Studies Project, Post-Secondary Disadvantaged. Final Report. (ERIC Document Reproduction Service No. ED 131 888)
- Clarke, G. C. 1972. A Career Development Workshop for Emotionally Disadvantaged Students. ERIC Document Reproduction Service No. ED 072 367)
- Cohen, A. M. and F. B. Brawer. 1970. Student Characteristics. Personality and Dropout Propensity. (ERIC Document Reproduction Service No. ED 038 130)
- Compensatory/Developmental Programs in Texas Public Community Colleges: Report of a Survey. Austin: Texas College and University System Coordinating Board. 1975. (ERIC document Reproduction Service No. ED 110 133)
- Donovan, R. A. et al. 1977. The Final Report of National Project II: Alternatives to the Revolving Door. (ERIC Document Reproduction Service No. ED 151 054)
- Feldman, B. N. 1977. Curriculum Development in the Affective Domain. (ERIC Document Reproduction Service No. ED 139 483)
- Grant, M. K. and D. R. Hoerber. 1978. Basic Skills Programs: Are They Working? (ERIC Document Reproduction Service No. ED 150 918)
- Heinkel, O. A. 1970. Evaluation of a General Studies Program for the Potentially Low Academic Achiever in California Junior Colleges. Final Report. (ERIC Document Reproduction Service No. ED 039 881)
- Identification and Accommodation of Disadvantaged and handicapped Students in Virginia Community Colleges. White Plains, NY: Educational Research Services, Inc. 1971. (ERIC Document Reproduction Service No. ED 059 707)
- Klingelhofer, E. L. and L. Hollander. 1973. Educational Characteristics and Needs of New Students: A Review of the Literature. (ERIC Document Reproduction Service No. ED 084 482)
- Lee, G. E. 1974. A Comparative Study of the Persistence and Academic Achievement of "Project 60" and Regularly Enrolled Students at Middlesex Community College. (ERIC Document Reproduction Service No. ED 100 481)

- Linthicum, D. S. 1979. Statwide Assessment of Developmental/Remedial Education at Maryland Community Colleges. Annapolis: Maryland State Board for Community Colleges. (ERIC Document Reproduction Service No. ED 175 514)
- Mink, O. G. and G. E. Watts. 1973. Reality Therapy and Personalized Instruction: A Success Story. (ERIC Document Reproduction Service No. ED 115 323)
- Opportunities in Iowa's Area Schools. 1971-1972. Des Moines: Iowa State Dept. of Public Instruction. 1972. (ERIC Document Reproduction Service No. ED 067 091)
- Overview of Developmental Studies for Occupational Students: A Sourcebook for Post-Secondary Programs. Ithaca: State University of New York. 1976. (ERIC Document Reproduction Service No. ED 128 031)
- Puig-Casauranc, M. 1974. Remedial Programs: Are They the Panacea or the Problem? A Report of the National Dissemination Project for Post-Secondary Education. (ERIC Document Reproduction Service No. ED 092 189)
- Reap, M. C. and H. C. Covington. 1980. Evaluation of the Effectiveness of the Developmental Studies Program. (ERIC Document Reproduction Service No. ED 197 798)
- Rice, G. A. and W. Scofield. 1969. A Contrast Between the "Successful" and "Dropout" Student at Yakima Valley College. (ERIC Document Reproduction Service No. ED 030 416)
- Rodwick, J. and M. J. Grady. 1976. The Second Change: A Summary Report. (ERIC Document Reproduction Service No. ED 119 179)
- Romoser, R. C. 1978. Results of the Second Assessment Study of Developmental Education Programs in Ohio. Ohio Statewide Committee on Developmental Education. (ERIC Document Reproduction Service No. ED 157 587)
- Roueche, J. E. 1968. Salvage Redirection or Custody? (ERIC Document Reproduction Service No. ED 019 077)
- Roueche, J. E. and O. G. Mink. 1975. Toward Personhood Development in the Community College. (ERIC Document Reproduction Service No. ED 114 137)
- Schiavone, J. 1977. Effectiveness of Remedial Reading Courses in Upgrading Skills of Underprepared Students Who Entered Manhattan Community College Under the Open Admissions Policy. (ERIC Document Reproduction Service No. ED 134 284)

- Slark, J. 1978. Longitudinal Study of Student Flow and Persistence. (ERIC Document Reproduction Service No. ED 158 825)
- Snyder, F. A. and C. E. Blocker. 1970. Persistence of Developmental Students. (ERIC Document Reproduction Service No. ED 042 438)
- Sparks, J. R. and C. L. Davis. 1977. A Systems Analysis and Evaluation of a Junior College Developmental Studies Program. (ERIC Document Reproduction Service No. ED 136 892)
- Swofford, R. and J. C. Swofford. 1973. Development Studies in North Carolina and Virginia: A Constant Search for Anything That Will Work. (ERIC Document Reproduction Service No. ED 082 727)
- Taniguchi, Bessie. 1970. A Study of Curriculum Development and Trends in the Business Education Department at Kapiolani Community College for the Period 1964-1970. (ERIC Document Reproduction Service No. ED 042 447)
- Tinto, V. and R. H. Sherman. 1974. The Effectiveness of Secondary and Higher Education Intervention Programs: A Critical Review of the Research. (ERIC Document Reproduction Service No. ED 101 042)
- Vaughan, G. B. and D. E. Puyear. 1972. After the Open Door: An Approach to Developmental Education. (ERIC Document Reproduction Service No. ED 059 714)
- Young, Jerry W. 1977. Developmental Education in the Community College. (ERIC Document Reproduction Service No. ED 145 909)

Dissertations

- Christie, T. L. 1979. A Study of Students' Academic Performance After Exiting Remedial Learning Programs at Dalton Junior College. Unpublished doctoral dissertation. George Peabody College for Teachers.
- Craig, J. 1975. An Assessment of the Effectiveness in Developmental Education Programs in Selected Urban Community Colleges in the Commonwealth of Virginia. Unpublished doctoral dissertation. Florida State University.
- Lesnick, H. M. 1980. A Study of the Effectiveness of the Developmental Program at Northern Virginia Community College's Annandale Campus. Unpublished doctoral dissertation. The George Washington University.

- Patterson, M.C.M. 1980. A Study of Congruence Between Delphi Validated Policies and Procedures Which Promote Learning Among High-Risk Students and Current Practices in Selected Community Colleges. Unpublished doctoral dissertation. The University of Texas at Austin.
- Shapiro, E. S. 1979. Reducing Barriers Between Faculty and Students: An In-Service Demonstration Program for Faculty Development in the Community College. Unpublished doctoral dissertation. Boston University School of Education.
- Tullar, V. P. 1979. Procedures for Evaluating Student Services in Community Colleges. Unpublished doctoral dissertation. The University of Arizona.
- Whittle, D.H.P. 1980. Success in Freshman English Preceded by Developmental English: Predicting Success Through Persistence and Selected Demographic Variables. Unpublished doctoral dissertation. The University of Virginia.