To the Graduate Council:

I am submitting herewith a dissertation written by Conlie Glen Rasnake entitled "The assessment of the Developmental Program at a Private Junior College in Tennessee." I have examined the final copy of this dissertation for form and content and recommend it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Curriculum and Instruction.

John R. Ray, Major Professor

We have read this dissertation
and recommend its acceptance

Accepted by the Council:

Vice Provost
and Dean of the Graduate School

THE ASSESSMENT OF THE DEVELOPMENTAL PROGRAM AT A PRIVATE JUNIOR COLLEGE IN TENNESSEE

A Dissertation

Presented for the

Doctor of Education Degree

The University of Tennessee, Knoxville

Conlie Glen Rasnake

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ABSTRACT

Developmental programs are a part of college curricula. This is due to the number of students entering college today that do not have the skills to succeed in college and the necessity by colleges to recruit more students. There is a large pool of non-traditional students that require some developmental/remedial studies before attempting college-level courses.

The purpose of this study was to investigate the nature of the developmental program at Hiwassee College. The study had seven main components: 1) the history of the developmental program itself; 2) the characteristics of the developmental and non-developmental student at Hiwassee College; 3) the results of the fall 1989 testing and advising; 4) performance of the fall 1989 semester developmental students; 5) the comparison of the success of the developmental and non-developmental students in terms of hours attempted, hours completed, and GPA; 6) the attrition and graduation rates for the two groups; and 7) the analysis of a student questionnaire.

Results of the study suggest that the developmental program at Hiwassee College was sufficient to identify the developmental student. The ASSET tests was a good predictor of success in college. Students are successful in college-level English as a result of developmental reading and writing. The developmental mathematics portion of the program was not very success in preparing students to be successful in college-level mathematics. The graduation rate for the developmental students was 7.5% at the end spring 1991 semester and the graduation rate for the non-

developmental students was 28.8%. The GPA at the end of the spring 1991 semester for the two groups differed slightly. The retention rates of the two groups differed by approximately 10%, with the retention rate of the developmental group being the lowest.

Students response to the questionnaire gave the developmental program a 3.5 on a 5 point scare in terms of content, structure, and instruction. Their attitude toward developmental courses increased from 2.7 (on a 5 point scale) before taking a developmental course to a 3.45 after taking a developmental course.

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CHAPTER I

INTRODUCTION

The past several years have seen an increase in competition by colleges and universities for students. This is due in part to an increase in the number of state community colleges and community centers of state colleges and universities. Some of these community centers may offer only a few courses while others offer a complete degree transfer curricula. These community colleges are essentially open admission colleges. Private junior colleges must compete with these "new" colleges for students.

Abraham (1987) states that "both the number and percentage of high school graduates enrolled in higher education have increased dramatically" (p. 2). According to the U. S. Department of Commerce the percentage of 18- to 21-year old enrolled in college has increased from 23 percent in 1970 to 36 percent in 1984 (1971, p. 13, 1985, p. 3). In 1972, 45 percent of the high school graduates attended college a year after graduation, and in 1980, 46 percent had attended a year after graduation (National Center for Educational Statistics [NCES], 1985b). In 1987, 56.5 percent of high school graduates enrolled in college (NCES, 1990). While there are more students seeking college entrance, there are more colleges from which these students may choose.

This increased competition has necessitated the restructuring or reassessing of the entrance requirements by many private colleges. More specifically, private colleges find themselves rethinking their admission requirements. This increased competition has brought on a transition from

restricted admissions by private colleges to open-admission. This change in admission requirements has in many instances made it more difficult to maintain academic standards.

In addition to the competition for students, there is a generally held view by society that higher education should be open to everyone who has completed high school or its equivalent. Abraham (1987) concludes that this "access to higher education is now a cornerstone of American education and social policy" (p. 1). However, he states that access must mean more than exposure to a "watered-down" collegiate education or a "quick failure" with college-level work.

Therefore, many colleges and universities have been forced by these conditions to become essentially "open door" colleges. Abraham (1987) noted that 60 percent of two-year schools in the Southern Regional Education Board (SREB) states have open-admission. This "open door" must mean more than a "revolving door" as expressed by the following policy statement of the American Association of Community and Junior Colleges (1987):

> Opportunity with excellence has become the clear message for community, technical, and junior colleges. In many ways the word "opportunity" can be translated into "access". The mission of community, technical, and junior colleges must go beyond the limited understanding and practice of "open door" admissions. Access must be seen as an effective process to ensure students success. A new definition of access must focus on the institution's responsibility to help its students succeed once they enter the "open door", with retention and program completion as key components (p. 107).

Rouche (1971) implies that all colleges should have an "open door" policy when he states that some post-secondary education is almost a vital national need, since there are few job opportunities for the high school graduate. In order for America to compete in the world market, workers

must produce a product that is both competitive in price and quality. American industry must be able to adjust to new and changing world markets, world markets that are increasingly more technical. America's management and labor will be required to have the necessary communication skills and technical skills to compete in those markets. America's colleges and universities are expected to train people in these skills. In order to do this, America's colleges and universities must maintain academic standards at the same time that they are experiencing their greatest influx of underprepared students. This will require colleges to adapt their curricula to assure that students leave college with these skills.

A similar view is echoed in a report from the National Science Board (Science and Engineering Indicators, 1989):

> Too many students leave high school without the mathematical understanding that will allow them to participate fully as workers and citizens in contemporary society. As these young people enter universities and businesses, American college faculty and employers must anticipate additional burdens. As the supply of adequately prepared precollegiate students remains substandard, it will be difficult for these institutions to assume the dual responsibility of remedial and specialized training; and without highly trained personnel, the U.S. risks forfeiting its competitive edge in world and domestic markets. (p. 26).

Many students are in college today who would not have been in college a few years ago. In fact, in the fifties only about 30 percent of the high school graduates went to college. In the fifties there were good blue collar jobs available for the high school graduate. Today the jobs that are available to the high school graduate are "dead-end" jobs with low pay and little opportunity for advancement. Today there is little opportunity for advancement without some post-secondary education. Such conditions "encourage" the high school graduate to attend college.

Abraham (1987) reports that only one-third of all high school students today in the SREB region are enrolled in college preparation programs. This would indicate that as many as two-thirds of the high school graduates who go to college will require some form of remediation or at least more preparation before completing college work. Abraham (1987) reports that 38 percent of the freshmen in four-year liberal arts and comprehensive colleges are enrolled in remedial-developmental courses. A slightly smaller percentage (37 percent) of the freshmen in two-year colleges are enrolled in remedial/developmental courses. Interestingly, 22 percent of the freshmen in doctoral-granting and research universities are enrolled in remedial/developmental courses. This remediation falls mainly into two major areas--language (English) and mathematics. The report "A Nation At Risk" (1983) states that between 1975-80 the number of remedial mathematics courses alone increased 72 percent. Forty-two percent of <u>all courses</u> at the junior or community college level are taught as "remedial" courses (Chang, 1983, p. 1).

In a report by the National Assessment of Educational Progress entitled "The Mathematics Report Card: Are We Measuring Up?" (Report #17-M-01: Princeton: Educational Testing Service, 1988) the authors are more specific. This report states that most seventeen year old have an excellent understanding of basic mathematics skills, basic operations, and problem solving; but only 51 percent can handle moderately complex procedures and reasoning. Only a small percentage (6 percent) can handle multi-step problem solving and algebra that deals with fractions, percentages, basic geometric figures, exponents, and square roots. The same report further

states that by the age of seventeen most high school students will have finished their high school mathematics studies.

In order to maintain high academic standards and have open-admission, colleges have established developmental/remedial programs as an integral part of the curricula. Developmental/remedial programs should enhance the academic program by preparing the unprepared college student for college-level courses. Developmental/remedial programs have as their main objectives the removal of academic deficiencies and the development of productive study skills before students attempt college level courses.

Developmental students are often classified as low-achievers, educationally deprived, and/or first generation college students. These students generally are deficient in skills necessary for success in college such as appropriate study habits. These students are sometimes classified as high-risk students. High-risk is a term that is generally used to designate a student who has a high probability of becoming a college dropout. When colleges make admission selections as to students, the high-risk or developmental student is ignored. Today, with the competition for students, colleges are designing programs to meet the needs of these students. The National Commission on Excellence in Education in its report, "A Nation at Risk" (1983), gave national attention to the frustration of academic achievement by parents, teachers, students, and school officials. From the standpoint of the developmental student that "frustration" is more severe.

In many cases the lack of academic achievement by the developmental student can be traced to social conditions. Developmental students come

largely from low socio-economic conditions and one-fifth are below the poverty line. Many of these students are minorities and by the year 2000 one-fifth will be non-English speaking minorities (Newsweek, May 2, 1988). There is evidence that developmental courses have a positive effect on the success and retention of these students (Abraham, 1987).

Statement of Problem

Judging from the number of developmental/remedial courses offered by colleges, these courses must be perceived by college personnel to be an appropriate response to low achievement and projected dropouts among developmental students. Developmental programs should serve to maintain enrollment and preserve academic standards. The logical question to ask is, "To what extent do developmental programs have a real effect on students' success in college and retention in college?" "Does the developmental program give the students the tools with which to achieve their educational goals?"

Purpose

The purpose of this study was to determine the impact of the developmental curricula at Hiwassee College on developmental students in terms of achievement and retention. This study compared the success and retention of developmental students with non-developmental students. More specifically, this study described the academic problems and characteristics of developmental students at Hiwassee College.

Hiwassee College is a small private two-year college with the mission of providing an educational opportunity to any deserving student who meets its admission requirements. In order to fulfill its mission, Hiwassee College's educational program includes both college-level courses and developmental courses. A brief history of the developmental program at Hiwassee College will be summarized in Chapter IV.

Rouche (1971) states that most remedial programs are "poorly designed, poorly taught, and seldomly evaluated carefully" (p. 12). Evaluations of college curricula are necessary in order to 1) diagnose the curricula, 2) revise the curricula as to content and materials, 3) make comparisons of programs and instruction, 4) anticipate educational needs, and 5) determine if goals and objectives have been achieved (Eisner, 1979). The developmental curriculum at Hiwassee College needs to be evaluated to determine if it is meeting students' needs. Is the curriculum appropriate for the population? Do the content and materials fit the needs of the students and are they appropriate to their educational backgrounds? This study will provide information that can be used to make recommendations that will strengthen the developmental program at Hiwassee College.

Specific questions addressed by this study are:

(1) How did the success rate of the developmental students compare with the success rate of the non-developmental students?

(2) What was the length of time required to complete the developmental curricula before attempting college level work?

(3) How did the success rate in college-level courses of the developmental student who completed the developmental curricula in one semester compare with the success rate of those who completed the program in two semesters?

(4) How did the attrition rate of the developmental students compare with the non-developmental students?

(5) What effect did the developmental program at Hiwassee College have on the success and retention of its students?

(6) How effective was the developmental program for the developmental students?

The study focused on two areas.

Subproblem 1

The first subproblem was to obtain a detailed description of the evolving developmental program at Hiwassee College over the past ten years (1980-89). This gave a picture of the present program and reasons for its structure.

Subproblem 2

The second subproblem included a comparison of the background characteristics of the developmental students and the non-developmental students at Hiwassee College. Comparisons were made of the degree of success and retention of the developmental students with the non-developmental students at Hiwassee College. A determination of the effectiveness of the developmental program was addressed. This was the main focus of the study.

Procedures and Sources of Data

Subproblem 1

1. A study of the historical development of the developmental program was conducted through the use of the following data sources:

   a. College catalogues
   b. Timetables(class schedules)

2. Historical perspectives, current status of the program, and future recommendations were summarized from this data.

Subproblem 2

1. Records for the fall semester of 1989 were examined to obtain a list of all freshmen students carrying twelve or more hours. These records included the personal files of each student by the college. This data base contained information on the high school performance, ACT scores, sex, ethnic background, and the results of the freshmen testing done by the college. This included the ASSET tests results and the writing sample results.

2. From the fall 1989 freshmen class three groups were selected.

   Group IA were those students who enrolled in the remedial/developmental program and completed that program in one semester and then enrolled in college-level courses. These students were tracked through the spring 1991 semester to determine their progress toward a degree and the assessment of the number of college hours of credits attempted, hours completed, and GPA.

   Group IB were those students who took two semesters to complete the developmental/remedial program before enrolling full-time in college-level courses.

   Group II were the non-developmental students (Those regular admitted students who took twelve or more hours of college-level work).

3. Various backgrounds of these selected groups of students were investigated to obtain a profile of each group for comparison, including:

   a. A.C.T scores in English and mathematics
   b. A.C.T. composite scores
   c. High school GPA
   d. Race
   e. Age
   f. Gender
   g. College major
   h. ASSET (Language usage, reading, numerical, and algebra scores)
   i. College administered writing sample scores

4. Data collected on these groups was used to establish a profile of the background characteristics of the two groups-developmental and non-developmental students at Hiwassee College.

5. These three groups were then tracked through the spring 1991 semester, to determine the academic success of each group. The College academic records were used to obtain this information. Factors included in this study were:

   a. Attrition rate
   b. Hours attempted (HA)/hours completed(HC)
   c. GPA by semester and cumulative
   d. GPA in subject area of mathematics and English
   e. Graduation rate

6. Developmental students who entered as freshmen in the fall of 1989 and were enrolled in regular college-level courses in the spring 1991 were asked to complete a questionnaire. This questionnaire was used to determine the students' perception of the effectiveness of the developmental program at Hiwassee College.

Rationale

Today more than at any other time in history, all students must have skills in communicating (language), conceptualizing, and coping with information as well as basic skills in mathematics to function in a scientific world. These skills constitute the major components of a sound developmental program. Many students seeking college entrance today lack these skills and are labeled as developmental/remedial.

The essentially "open door" practice permits the admission of students who are deficient in basic skills. Colleges must plan programs that diagnose the student's strengths and weaknesses and then design a program that meets students needs by preparing them for college-level courses. The program should be designed so that the developmental student will master the communicating (language), conceptualizing, and coping skills needed to succeed in college and to meet career objectives.

A substantial amount of research in the area of developmental/remedial programs has been done in the last two decades. This is evident by the

number of federally funded developmental/remedial programs. This research includes specific aspects of developmental/remedial education such as developmental reading (Garth, 1973), developmental chemistry (Fowler, 1988), attitudes of the administration and faculty toward developmental/remedial education (Farrow, 1985), study of high-risk students and developmental education (Martin, 1972), a study of the comparison of freshmen persistence and performance (McCornak, 1985), and evaluation of a junior college's developmental educational program (Budig, 1986).

However, there has been no formal study of the developmental program at Hiwassee College. This study focused on the developmental students's success as compared to non-developmental students at Hiwassee College. The impact of the developmental program on the retention and success of the developmental student at Hiwassee College was analyzed. A comparison of the retention and success of the developmental students was made with the retention and success of the non-developmental students by tracking both groups through a two year time span-1989-1991. It was necessary to track students through the program to assess the hours attempted and hours completed to determine if the developmental program was meeting students and institutional goals and objectives. McCornak (1985) tracked 2057 students at two state universities in Oregon from 1981 through 1984. The success rate in that study was 67 percent. The information gained by this study will provide a framework for improving the effectiveness of the developmental program at Hiwassee College. This study will show both strengths and weaknesses of the developmental program.

It is imperative that private junior colleges begin to carefully examine their student populations and their provisions for successful remediation. No study that addresses the effectiveness of remediation at Hiwassee College has been attempted. Several assumptions about the effectiveness of remediation have been made as evidenced by the number of developmental/remedial courses offered at Hiwassee College. Only bits and pieces of data have been collected to either refute or substantiate these assumptions. Only limited tracking has been done and this has been by separate departments--English and mathematics. Results of this tracking gives the success rate in college-level math and English for those that completed the developmental courses. This data also shows the attrition rate for the developmental student for the years 1986-1988. The success rate in a college-level English was approximately 65 percent for those who complete the developmental writing and/or reading courses. The success rate in a college-level mathematics course for those who completed a developmental math course was approximately 21 percent.

Basic information on developmental students as they enter college and exit college should be collected. This information should then be utilized to provide a foundation on which an effective developmental program can be built.

Description of Subjects

This research was conducted at Hiwassee College during the 1990-1991 school years. The freshmen class of 1989 was tracked through the spring 1991 semester. A computer generated freshmen class roster was

used to select two developmental groups--those who complete the developmental programs in one semester and a second group who complete the developmental program in two semesters, and a non-developmental group from the 1989 freshmen class. These groups were tracked through the spring 1991 semester. The developmental groups consisted of students taking one or more developmental course.

Students are enrolled in courses at Hiwassee College after his/her records are reviewed with him/her by a faculty advisor in the student's indicated major. These records includes the student's high school transcript, ACT scores, the recommendation of the Developmental Studies Committee, and his/her condition of admission. The recommendation of the Developmental Studies Committee is based upon the student's ASSET tests scores and writing sample score. These tests--ASSET and writing sample--are completed as part of freshmen orientation. The recommendation of the Developmental Studies Committee may include one or more developmental course. In addition, the Admission Committee, as a condition of the student's admission, may suggest, recommend, or require one or more developmental course. Students may elect to disregard the recommendation of the Developmental Studies Committee. However, they may not ignore a requirement set by the Admission Committee.

The grading scale for courses at Hiwassee College was ABCDF with the exception of developmental courses. The grading scale in these courses was ABCPF. The grade of P was used to designate progress. Each letter grade was preceded by "DS" to denote developmental studies. No credit hours are awarded and no quality points were given for a grade of P. Credits in developmental courses are institutional credits only and as such

are not intended to transfer and can not be used to meet graduation requirements.

Three groups were studied:

Group IA--Developmental students who completed the developmental program in one semester and enrolled in only college-level courses.

Group IB--Developmental students who required two semesters to complete the developmental courses and enrolled in only college-level courses.

Group II--Non-developmental students were those freshmen who enrolled in regular college credit courses.

The high-risk (developmental) students are those who have an erratic high school record of success, low socio-economic status, unimpressive standardized test scores, and as such are placed at a disadvantage in contention with the vast majority of college students (Moore, 1970). In other words, these students have experienced little previous academic success and are often subjected to deliberate academic neglect. These students are placed in college-level courses and consequently fail and drop out of college.

Students in the developmental group generally have a mathematics and/or English ACT of twelve or below. They have failed Hiwassee's writing test and they have failed one or more parts of the ASSET tests. The cut-off scores for the ASSET test and the writing sample are determined by the Developmental Studies Committee on an annual basis.

International students in the freshmen class of 1989 were eliminated from the study. Comparative testing information, high school information, and comprehension of the English language are often not available for international students. Most international students are placed in a special

English course during the first semester and are not required to complete the freshmen testing program--ASSET tests and writing sample.

Historical Background of the College

Hiwassee College traces its history back to 1849. It was at that time that a group of ministers who had been holding camp meetings on Bat Creek near the college decided to organize a school. This early school taught all grades. At one time it offered a Masters Degree. It is now a junior college. For most of its history it has been connected with the Methodist Church. It is presently operated by the Holston Conference of the United Methodist Church which operates two other colleges. The college is situated in a rural area on approximately 300 acres. The student population over the past several years has averaged approximately 500. Most of its students are from rural areas and generally from smaller high schools. It is both a boarding school and a commuter school. Approximately 60 percent of its students are boarding students.

The mission of the college as stated in the most recent catalogue is:

> The mission of Hiwassee College is to provide an educational environment within which each individual may fulfill his or her mental, physical, social, and spiritual potential. (Hiwassee College catalogue, 1990-91, p. 3).

Hiwassee College has had some form of a developmental program for the last twenty years. In more recent years the developmental program has received renewed and additional interest in light of recent research concerning the high-risk (developmental) student and Hiwassee's need to recruit and retain students. The developmental program has been a

continually changing one and for the most part uncoordinated with the academic programs of the college.

The developmental program at Hiwassee has as its main objectives to remove deficiencies in math and/or English and to aid the student in developing the study skills necessary for success in college. The goals and objectives are described in more detail in Chapter III of this study. Description of the developmental courses, as well as grading and credits, also are presented in Chapter III.

Assumptions

As the research proceeded certain necessary assumptions were made. These assumptions are:

1. Information in this study applied to Hiwassee College only.
2. This study was limited by the structure and characteristics of the fall 1989 freshmen class at Hiwassee College. Structure and characteristics of other groups may and possibly will vary and affect the outcomes.
3. This study was further limited by the variables studied.

Definition of Terms for the Study

For the purpose of this study the following terms are defined:

1. Developmental students--Fall 1989 freshmen students at Hiwassee College who are "placed" in one or more developmental courses.

2. Non-developmental students--Fall 1989 freshmen students at Hiwassee College who are taking twelve of more credit hours of college-level courses.
3. Developmental curricula--Those courses offered at Hiwassee College which are classified as developmental or remedial. (These courses are discussed in Chapter III of this paper.)
4. ASSET testing (A student advising, placement, and retention testing service of the American College Testing Program.)--This is a battery of tests that measures the student's skills in reading, language usage, and mathematics. This battery of tests was given during the freshmen orientation to all first time freshmen.
5. Writing sample--Hiwassee administered and graded writing sample. It was administered to all freshmen during orientation. This sample was graded by at least two regular English teaching faculty members. It was scored from one to five (one for poor and five for excellent). It was graded based on structure, grammar, and other generally used conventions.
6. Success--Success is receiving a grade of C or better in a developmental course or a college-level mathematics or English course.
7. Retention--Retention means that a student has enrolled for four consecutive semesters.
8. Hours attempted (HA)--Total number of hours for which a student officially registers in any one term.
9. Hours completed (HC)--Total number of hours in which a student earns a passing grade.

Procedures

The primary purpose of this study was to determine the impact of the developmental curricula on the high-risk (developmental) students in terms of student achievement and retention. The freshman class at Hiwassee College for the Fall 1989 was selected for this study. To accomplish this study it was necessary to:

1. Survey the pertinent literature.
2. Secure the Academic Dean's permission to conduct the study.
3. Obtain the permission of the Registrar to make use of the students academic files.
4. Obtain permission of the Director of the Developmental Program to use information.
5. Identify the three groups used in this study.
6. Develop a questionnaire which could be administered to a group of those developmental students who had begun their developmental course(s) in the fall of 1989 and were still enrolled at Hiwassee College in the spring of 1991.

A more detailed explanation of these materials and how they are used will be made in Chapter III of this study. Since this study was concerned with the impact of the developmental curricula on student achievement and retention at a private junior college in East Tennessee the methods employed are designed to gain information about the three groups from the freshmen class of 1989, and to compare their grade point averages (GPA), total hours attempted, total hours completed, and retention of these groups. These groups were tracked through two academic years.

Procedures used in Analysis of Data

The main procedures consisted of a comparison of the variables referred to above (p. 9) and the analysis of the responses on the student questionnaire. These are addressed in Chapter IV of this study.

1. Comparison of ACT in math with grade in math 0980, 0990, or 1110.
2. Comparison of ACT in English with grade in English 0980, 0990, or 1010.
3. Comparison of the ASSET test scores:
   (a) Numerical and algebra score on ASSET with math score.
   (b) Language usage and reading scores with English grade.
4. Comparison of the writing sample grade with the grade in English.
5. Comparison of the high school GPA with the college GPA.
6. Comparison of the GPA of the three groups at the end of one semester, two semesters, and at the end of two years.
7. Comparison of the attrition rate for each of the three groups and the overall attrition rate.
8. Assess the effectiveness of the developmental program by analysis of the students responses on the student questionnaire.
9. Comparison of hours attempted and hours completed for the three groups.

Organization of the Study

Chapter I contains the introduction and description of the study. Chapter II presents a review of the literature on developmental programs (curricula). This literature review is discussed as follows: (1) How students are placed in developmental courses, (2) Characteristics of the developmental student, (3) Factors that determine success for the developmental student, (4) Comparison of persistence and performance of the developmental student, (5) Comparison of retention and persistence, and (6) Comparison of the success rate for the developmental student with the non-developmental student.

Chapter III contains the description of the population, discussion of the developmental curricula at Hiwassee College, the method used to collect information, and procedures of the research. In Chapter IV the findings are presented and summarized. Chapter V contains the summary of the findings, conclusions, recommendations, and implication for further study.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The junior or community college has gradually defined its purpose and functions. Originally the junior or community college had as its function to relieve the university's burden, by concentrating on the first two years of college transfer programs. Junior colleges have broadened their philosophical and educational functions due to the influx of the underprepared students, due to the competition for students, and due to perceived needs of the communities by junior college officials. A major emphasis now is on remedial/developmental education. A second major emphasis is on vocational/technical education, with a third area of emphasis on continuing education and community service. This broadened emphasis is brought about in part by the fact that many students entering college today are poorly prepared for regular college studies.

As early as 1894 a remedial course was offered by Wellesley College. With the implementation of this course, the educators at Wellesley recognized the fact that colleges bear responsibility for the deficiencies of their students. Educators believed that by the implementation of developmental/remedial courses students' deficiencies could be eliminated or at least managed. It was hoped that these developmental courses would enable students to establish sound study habits as well. These "study habit" courses were replaced in the 1940's by courses in reading

(Cross, 1977). Schenz (1964) reported that many junior colleges were observing that a growing proportion of their students were academically unprepared for college level work. Moore (1970) estimated that 60 percent of the community college students were at or below the 30th percentile on ability level.

According to Medsker (1971) research on the community college student has consistently revealed a gap between his/her educational aspirations and his/her academic abilities. This is illustrated by the fact that 70 percent of entering community college freshmen enroll in a college transfer program but only 30 percent actually transfer (Medsker, 1971).

With the increased governmental funding for education and with the political pressures of the 1960's, colleges experienced an unprecedented enrollment growth. Many colleges, both private and public have embraced the open-admission concept. Many of the students admitted by the open-admission policy were unprepared to do college-level work; therefore, for many of these students the open-door policy became a "revolving door." Many of those admitted through the open-admission are older students who may not have finished high school. Characteristically the student body of the junior or community college is becoming older and non-traditional. Adult education statistics indicated that 90 percent of incoming community college students have verbal deficiencies (Pearse, 1982). A dramatic illustration of this statistic was given by Roueche (1980) when he concluded that more than 50 percent of community college freshmen were reading below the eighth-grade level. Gainous (1985) concluded that as many as 97 percent of all colleges and universities have identified students' deficiencies in basic skills as the major problem among

freshmen students. Gainous went on to say that "Nationally, as many as 50 percent of newly enrolled community college students do not have sufficient basic skills necessary to succeed in college" (p. 2). Without some remedial work these students would enter college one term and flunk out or drop out the next term. The attrition rate for those students who were reading below the eleventh grade was overwhelming (Pearse, 1982). Pearse (1982) cited a study by Shelton and Hunter (1980), which indicated that the most often stated reason for dropping out of college was inadequate preparation.

The colleges' response to these conditions was more how-to-study courses as well as remedial reading courses. By the late 1960's most community college had developed courses and programs to respond to students with academic deficiencies (Roueche & Snow, 1978). In Roueche and Snow's (1978) study of 150 public two-year and 150 four-year colleges, 86 percent of the colleges offered some form of special services program to the academically unprepared student. The main composition of these special services programs was developmental/remedial courses with tutorial and laboratory components. It is of interest to note that developmental/ remedial education is not just a junior college problem, but rather a structural problem for which all segments of American education must share responsibility (Gainous, 1985).

A review of the literature indicated that the developmental studies can be summarized under the following headings: 1) How students are placed in developmental studies, 2) The characteristics of the developmental student, 3) Factors that determine success for the developmental student, 4) Persistence and performance of the developmental student, 5) Retention

and attrition of the developmental student, and 6) Success of the developmental student.

How Students are Placed in Developmental Programs

The most common method used to place students in developmental/ remedial courses or programs was by testing. This testing was usually done during freshmen orientation sessions. Argumendo (1989) reported that twenty (72 percent) of the twenty-nine Michigan Community Colleges in 1988 required testing of all newly admitted students. These tests were both valuative and diagnostic in nature. Approximately 50 percent (fourteen) of these (Michigan) colleges had mandatory placement in writing, 45 percent (thirteen) in reading, and 34 percent (ten) in mathematics. Twenty-two of the colleges reported using the ASSET testing (American College Testing) as an assessment instrument, and twelve used the Nelson-Denny test as the their diagnostic instrument. In a similar study Michaels (1986) reported that Milwaukee Area Technical College used the ASSET tests in reading and math to determine placement in courses.

A somewhat similar pattern was followed at Tacoma Community College (WA); however, different tests were utilized (Spangler 1981). At Tacoma Community College all entering full-time students were placed in appropriate courses based upon the results of the Comparative Guidance and Placement Tests. The writer makes no mention of the structure of the tests or their content. Spangler classified 60 percent of the students at Tacoma Community College as "academically, educationally, or socially

disadvantaged" (p. 1). Twenty percent of these students had not completed high school.

Tacoma Community College's developmental program consisted of four different levels of course work. Level 0 covered the first through the fifth grades. Level 1 began with the sixth grade and ended with the completion of the eighth grade. Level 2 consisted of grades nine through twelve and Level 3 was a university-parallel program corresponding to the thirteenth grade (Spangler, 1981).

In what was described as a "carefully constructed sample" of all colleges and universities in the United States, Schonberger (1985) found that 20 to 40 percent of the colleges who had developmental programs in mathematics placed students by examination. It was interesting to note that 71 percent of the colleges and universities in this study felt that they ought to place their students by examination.

Pearse (1982) reported that Pima Community College (CA) used the Roueche holistic model for their developmental approach. A major component of that model was an extensive pre-assessment of students. This pre-assessment was made up of a diagnostic test battery of one- to two- hour duration that was designed to determine the nature and condition of the student's educational background. This test battery had a reading component, a "locus of control" component, and a career interest component (Pearse, 1982). The "locus of control" component correlated with personality dimensions and the student's expectancy of success.

Hobbs (1989) stated that Shelby State Community College (TN) has had a developmental service program since 1970. In 1985 as the result of a mandate by the Tennessee Board of Regents, Shelby State implemented

the Academic and Developmental Service Program. As the result of state mandate, virtually all freshmen entering Tennessee public colleges are now tested in writing, reading, computation and elementary algebra as part of the Academic Assessment and Placement Program (AAPP). The state mandate applied to first-term freshmen students who were twenty years of age or less and have an ACT composite score of fifteen or less. Shelby State had instituted an additional requirement of a writing sample. Also, all students who applied for regular admission at Shelby State were required to take the battery of tests (AAPP). This test battery had four components--writing, reading comprehension, logical relationships, and mathematics. Students were placed in developmental/remedial courses based on a cut off score set by the state of Tennessee and all Regent Schools assigned students based on these AAPP test results.

In a study of Vincennes University's (IN) developmental educational program, which was based on Roueche's standards for successful developmental programs, Budig (1986) stated that the university tested all new students whose scores on the ACT suggested the need for remediation. No mention was made of what that ACT score should be before remediation. Students were placed in developmental reading, writing, and mathematics courses based on the results of their test battery.

Ferguson (1991) reported that students at Southeastern Louisiana University were placed in developmental courses based on ACT scores. Students with a ACT composite score of fourteen or below were placed in a course called academic skills, with a score of fourteen or below on the English section were placed in developmental English, with a score of thirteen or below on the mathematics section were placed in developmental

mathematics, and with a combined English and composite score of fourteen or below were placed in developmental reading.

Abraham (1987) reported that in the region that makes up the Southern Region Educational Board (SREB), mandatory testing and placement was the most commonly used method for placing students in developmental courses. Table 10 on page 37 of the reports showed that 124 of the 240 two-year colleges reporting in SREB had mandatory assessment and placement for reading, 115 for writing, and 118 for mathematics. Table 12 (Abraham, 1986, p. 40) shows that the most common test used in reading was the Nelson-Denny Reading Test and the most used test in mathematics was one that was in-house/ institutionally developed. The most commonly used test in writing was either an institutionally-developed one or tests that involved writing sample/essay. Abraham made the statement that seventy different tests in almost one hundred combinations were used to place students in writing, reading, and mathematics in the SREB region.

Friedlander (1979) concluded that placement of students in developmental math should include placement tests as well as high school mathematics grades. He makes no reference as to which should carry the greater weight in placement of students. Roueche (1984) in a summary of a national survey of two- and four- year colleges reported that all responding groups favor mandatory pre-assessment. She noted that more were committed to mandatory testing than to mandatory placement. She also noted that most community colleges prefer to develop their own tests for assessment and/or placement.

In addition to test results, other information was used for placement of students in developmental courses. Spangler (1981) reported that Tacoma Community College used the recommendation of the instructor for placing students after the first quarter. As part of the advising process, faculty advisors and counselors were guided by a Developmental Education Advisor's handbook, which contained suggested programs at each skill level. It was noted that during the fall of 1979 and the fall of 1980, 88 percent of the students in developmental classes responded favorably to the instructor's recommendation. Those who were advised out of the developmental program to university-parallel courses had a 12 percent higher rate of retention than the rest of the college.

Argumendo (1989) reported that eleven (38 percent) of Michigan's twenty-nine community colleges use counselors, instructors, and student referral as means of placing students in developmental courses. While approximately 43 percent of Michigan colleges required testing for placement, it was apparent that most of them used extensive counseling for placement as well (Arguemdo, 1989). Similarly, Pearse (1982) pointed out that at Pima Community College counseling and counseling techniques were used when placing students in courses. Pearse made the comment that at Pima Community College the "judgmental method" had face validity but placement based on test results yielded better results. It appeared that students were more receptive to test results than to counselors suggestions.

Roueche (1984) reported that all responding groups continued to use high school grades as a means of placement in developmental courses. Abraham (1987) noted that approximately one percent of the two-year

schools place students based on low high school GPA and even fewer used high school rank as a placement tool. This indicated that colleges relied much more on high school course grades than on GPA or high school rank. It was also noted in the SREB region students' self-referral was evident in approximately 32 percent of the instances while faculty referral was evident in 35 percent of the cases (Abraham 1987).

It was evident that most colleges place heavy emphasis upon testing as a means of placing students in developmental courses. However, it was also apparent that most did not rely solely on testing as a means of placement, but a variety of information was utilized to place students in developmental courses. The placement process made use of high school course grades, test scores including ACT scores, and the student's own assessment of where they were in their academic pursuits.

Characteristics of Developmental Students

Attempts have been made to characterize the developmental student almost from the first developmental course. Many of the characterizations have been determined by looking at the college dropout. From this perspective the most defined characteristic was "lack of academic preparation." Various terms had been used to describe the developmental student, such as nontraditional or high-risk. Perhaps the most comprehensive description of the developmental or nontraditional student was given by Roueche and Kirk (1973):

> Nontraditional students are characterized by feelings of powerlessness, worthlessness, alienation, and inappropriate adaptive behaviors--unrealistic levels of aspiration, lack of problem-solving skills and experiences, hostility, aggressiveness, and often

> delinquency....They typically exhibit less social maturity and autonomy and feel that the only way they can equal or surpass their peers is through occupational pursuits or athletics endeavors....The community college high-risk student, then, is often a hesitant, conservative low-achiever with serious self-doubts, lack of confidence, poor mental health, and motivation too low to detect. He asks to be taught but does not really believe he can learn because he has experienced a lifetime of academic failure. While he aspires to self-actualization, he believes that he will fail again. (pp. 69-70).

Maxwell (1979) characterized the underprepared student as "marginal," "educationally disadvantaged," "academically unsuccessful," "non-traditional," or "remedial," (pp. 112-113), and more recent terms, "undereducated," "developmental," and "high-risk" have been added. Maxwell (1979) went on to say that underprepared students have been underachievers all their lives and are "rarely self-starters capable of sustained independent work" (p. 381). She further added that under-achievers :

> Usually seek simple cures and are convinced that the cure is a formula, short course, or technique that will alleviate their symptoms and one that will require minimal effort and time ....The treatments students suggest usually reflect their desire to remain in a passive, receptive role. (p. 55).

In addition to the underachievers described above there was evidence that there were many students of average and some of above average ability that were entering college poorly prepared or perhaps "misprepared." The decline in SAT scores over the past ten years was a reflection of the performance of all college students (Rounds, 1984). Many of these students had dropped out of high school and were now entering college. They typically had been out of school for some time and were in the lowest quartile of their class (Spangler, 1981). Approximately 37.5 percent of Americans over twenty-five years of age did not have a high school diploma. Of the Tacoma Community College population of 7,000 almost

20 percent had not graduated from high school and approximately 21 percent were minorities (Spangler, 1981).

While the above description gave a graphic representation of the underachiever or developmental student, these characteristics were at best difficult to evaluate quantitatively. A more quantitative description of the underachiever was given in a number of studies.

Doherty (1984) listed specific characteristics of a group of developmental students. In a study of 191 developmental students at Piedmont Virginia Community College he found that 62 percent were under the age of twenty-two, 59 percent were female, and 27 percent were black. Doherty noted that the student body at Piedmont had a Black population of only 8 percent. This showed that at Piedmont a disproportionate number of developmental students were Black.

Similar results were found by Gainous (1985) at Kansas Community College. Gainous found that some form of remedial education was offered at all nineteen Kansas community colleges. He found that 49 percent of the developmental students were male and 51 percent were female, 62 percent were in the age category of 17-22 years of age, and ethnic/minority constituted 28 percent. In addition 41 percent had academic majors, while 30 percent had undeclared majors. A large percentage of developmental students had no clear cut goals and were undecided as to what they wanted to do in college as well as in life. The larger percentage of females might be due to the fact that more women were returning to work and/or school.

Cox (1985) concluded that at San Joaquin State College 60 percent of the basic skill students were female, 24 percent were not high school

graduates, 30 percent scored below the eighth grade in reading, and 29 percent needed assistance in basic computation. The average age of the developmental student at San Joaquin State was 27.26 years old and 40 percent had dependents. Parrott (1982) noted at the College of the Sequoias that 32 percent of the entering freshmen were reading below the sixth grade level, 25 percent were reading between the sixth and ninth grade level, while another 30 percent were reading between the tenth and eleventh grade. This meant that approximately 13 percent were reading at or near the expected freshmen entrance level. Similar characteristics were found by Basonic (1982). In his study 31 percent were reading below the eighth grade level and 51 percent were reading below the eleventh grade level.

Kinney (1989), in his characterization of the remedial students, added that "remedial students also seemed to have low ability in the areas of math, English, and/or reading, as measured by ACT scores" (p. 359).

Cherne (1985) summarized the characteristics of developmental/remedial student at San Antonio College as follows:

1. Low placement scores
2. Low high school grade point averages
3. More part-time employment
4. Less likely to attend for job-related reasons
5. Plan to get a four year (or more) degree
6. Want help in basic skills
7. External locus of control
8. Lower socialization skills
9. More likely to be a minority
10. Undecided/Liberal Arts major (59 percent).

Cherne concluded that the developmental students at San Antonio College differed only sightly from non-developmental students. She attributed this in part to the fact that 72 percent of the college's freshmen

at San Antonio College should have been in developmental education, but many of these students elected not to enroll in such courses or programs.

Hobbs (1989) reported the result of his study of 656 developmental students in the fall 1988 at Shelby State Community College. He found that 233 were Caucasian, 421 were Black, 431 were female, and 451 were under that age of twenty-one.

Kinny (1989) reported the findings on a small group of ten developmental students. He found that developmental students tend to score less on a Self Esteem Inventory than non-developmental students.

Fadale (1977) in reporting on six two-year colleges in New York found that there seemed to be more developmental students that were male, mean average age was older, and a greater percentage had been rejected by their first choice of college.

Michaels (1986) gave a profile of 534 fall 1985 students at Milwaukee Area Technical College's Crossover Program. His classification was based on the result of the ASSET test scores. Approximately 46 percent of the students in the program scored in the 13-16 range on the reading and approximately 58 percent scored in the 11-19 range on the numerical (math) portion. Very few scored in the 20+ range on either test.

The characteristics of the developmental/remedial students are varied and often complex. The characteristics that are easy to obtain and most useful in the advising process are reading level and basic skills level. It would appear that a larger percentage of the developmental students are female and older. A disproportionate number are minorities. Each institution must determine the characteristics of its own developmental/remedial students.

Factors that Determine Success

In a survey of 513 developmental math students at eight Illinois community colleges, Frerichs (1981) found that such factors as 1) having a better self-image, 2) having a more positive attitude, and 3) having higher numerical skills were significant variables in predicting success. It was also noted that older students tended to be more successful in developmental mathematics. This study noted that 90 percent of the developmental students rated their own math ability as average or below average. Frerichs went on to comment "that many of the subjects lacked a compelling reason for taking the course" (p. 6).

Goldston (1983) concluded that older women (23-29) had a significantly higher pass rate than other age groups in her study. Again in her study a positive attitude correlated strongly with success in developmental mathematics. However, she also noted that a negative attitude did not correlate with failure. Also the highest rate of success was found to be those who worked 31-40 hours per week although no mention was made of the overall class load of these students. However the study did show that combined credit and work load had no significant affect on success. The author stated that the pass rate for students taking three or less credits was 60 percent, while those taking ten or more credits was only 40 percent. It would appear that class load was somewhat a determining factor of success. This study indicated that those with the greatest chance for success were older, working students taking a limited class load.

Roberts (1986) in a study of 916 students in five different programs including 229 Crossover students at Milwaukee Area Technical College found that reading and numerical scores on the ASSET test were good indicators for success in developmental courses. Roberts also found that males tended to have lower GPA's than females.

Fadale (1977) found such factors as "values of goal orientation, variety, conformity and recognition, commitment to a career goal, personal choice of college and program, and a positive outlook on the college experience" (p.38) were good predictors of success in developmental courses. In addition, reading ability and faculty prediction were good indicators of success in developmental courses.

Ganz (1988) found that "age, self-perceived views of reading ability, self-perceived chance of success, and self perceived ability to persist at a task were all good indicators of success in developmental courses." (p. 174). "Those students who indicated they were able to read at the college level actually averaged 20 percent better than those who admitted they were having severe problems in this area" (Ganz, 1988, p. 172). Younger students averaged 10 percent lower grades than older students. The number of hours worked, general life stress, and ability to cope were found to be poor predictors of success in developmental courses. This was a study of 203 students in various curricula.

Ochroch (1983) concluded that the successful developmental student scored higher on self-esteem instruments and tended to have a learning style that desired detailed instructions. Ochroch also noted that the majority of successful developmental students had entered college to acquire job related skills. They also planned to complete an associate

degree or certificate program. Basonic (1982) found that the first semester GPA was a good predictor of success in completing the developmental sequence.

 Attitude and self-image, age, and test scores particularly reading and mathematics test scores are good indicators of success in developmental courses. Each institution must determine which factors can be used to predict success for its students. These factors should be incorporated into the developmental/ remedial program.

Persistence and Performance

As early as 1972-73 a study by Cosby of the North Campus of Florida Junior College (Jacksonville) showed dramatic gains in developmental students when compared with non-developmental students. The developmental students averaged passing 7.9 hours with a GPA of 2.30 while the non-developmental students averaged passing 5.6 hours with a GPA of 1.20. It was noted that nearly four times as many developmental students passed all their courses as did the non-developmental students and more non-developmental students withdrew from classes. Similar results were noted during the winter term. The non-developmental student withdrawal rate was three times that of the developmental population. There was a higher attrition rate for the non-developmental student. Cosby (1982) concluded that developmental students passed more courses and made better grades than comparable students enrolled in college-level courses.

However, different results were obtained in a much later study by McCornak (1985). Seventeen of the eighteen remedial-nonremedial differences favored the non-remedial groups. For example, the average remedial cohorts had a pass rate of 68 percent while the non-remedial had a 80 percent pass rate at the end of one year. Even at the end of three years the results were 72 percent passing for the remedial compared with an 84 percent for the non-remedial. Thus the pass-fail rate was 12 percent higher for the non-remedial group. The persistence rates were very similar. The results were consistent at both universities in this study and in all three freshmen classes studied. In a study by Johnson (1985) success rates for developmental students were very similar to non-developmental students in English. Johnson further noted that the non-developmental students had a significantly higher success rate than the developmental students in mathematics.

Abraham (1987) found that 80 percent of the two-year schools in the SREB region had 50 percent or more of their remedial students completing the remedial courses. Eighty percent of the institutions reported that the remedial student graduation rate was somewhat better than the non-developmental students.

Hobbs (1989) reported that of the 203 who successfully completed the developmental English course, 187 (88 percent) successfully completed English Composition I with a GPA of 2.52. Males had a higher percentage (92 percent) of success in English composition and also a higher GPA (2.52) than did the female completers. Eighty-seven (43 percent) of those who completed developmental mathematics successfully completed college algebra with a GPA of 2.20. In math twenty-seven (54 percent) of the males were

successful while sixty (40 percent) of the females were successful. One hundred-nine (54 percent) of those who successfully completed the developmental courses successfully completed History I with a GPA of 2.51. Again the males out performed the females 49 percent to 70 percent with a GPA of 2.47 for females and 2.55 for males. Hobbs went on to state that remediation for those students who are deficient in more than one area may take longer than two semesters to overcome the deficiencies.

Berman (1974) reported on 4000 students--2000 basic skills students and 2000 non-basic skills students. His findings showed that a higher percentage of the A's and B's were received by the non-basic skills students (7.9 percent and 29.7 percent for the non-basic skills students as compared with 2.9 percent and 18.1 percent for the basic skills students). Similar results for the same group were obtained at the end of the second year. However, the percentage of passing grades for the basic skills students increased from 65 percent to 69 percent the second year. The percentage of F's for the basic skills group dropped from 16 percent to 10 percent. Suter (1982) found that the developmental students received 48.39 percent of the A's, B's, and C's in college level communications and 66.9 percent of the A's, B's, and C's in college level technical mathematics. This would indicate that the developmental courses were adequate preparation of college level courses. Suter also noted that 90 percent of those who failed the developmental course failed the college level course.

Doherty (1984) found that 75 percent of those with a developmental English grade of satisfactory passed their first college English course with an average GPA of 2.05. Forty percent of those who received a

satisfactory grade in both developmental courses (reading and writing) received an A or B in their first college-level English course. However, 72 percent of those with a final grade of repeat for developmental English also passed college level English with a GPA of 1.62. Doherty noted that there is no apparent causal relationship between successful completion of developmental English and success in college English. Fifty-four percent of the developmental students who were in good standing received a certificate.

In a study of developmental students in both English and mathematics, Basonic (1982) concluded that 80 percent of those who successfully completed the developmental English courses completed one college-level English course while only 48 percent of those who completed the developmental mathematics course were successful in a college-level mathematics course. To put this in another way, 23 percent of the developmental students completed a college level English course and only 13 percent completed a college level mathematics course. Twenty-eight percent of the developmental students (164) persisted long enough to enroll in the second semester of English.

Nunley (1981) found that there was no difference in the persistence between those who completed the developmental studies courses and a control group. Nunley concluded that the developmental studies approach at Northwestern State University was no more effective than placing the high-risk student in general studies courses at the University. This differed somewhat from Gordon's (1983) study in which it was concluded that there was a significantly higher rate of persistence among one group

of developmental reading students than for a comparable group who did not take the course.

Some evidence was found that students benefitted from developmental programs. Developmental programs tended to retain a larger percentage of the high-risk students. The persistence (staying) rate for the developmental students seemed to be greater than for the non-developmental students. Developmental programs tended to improve the performance of the developmental students beyond what would be expected for them. However, the results were mixed. There was some indication in the SREB region that the graduation rate for the developmental student was greater than that of the non-developmental student.

Retention and Attrition

Basonic (1983) concluded that only forty-six (28 percent) of the 164 students completed the developmental sequence of reading, English, and mathematics courses. However, twenty (43 percent) of those who completed the developmental sequence completed both a college level English and mathematics course. Forty of the 164 left at the end of the first semester and another forty-one left at the end of the second semester. Only four of the 164 had earned a degree by the spring term of 1981. Of those who left, 71 percent left by the end of the third semester.

Suter (1983) studied the retention rates of 134 students who enrolled in developmental basic communications as compared with 147 who elected to enroll in college level basic communications. Also a comparison was made between 143 students who enrolled in developmental technical mathematics

and seventy-three students who enrolled in college level technical mathematics. Eighteen percent of the college level basic communication (English) students withdrew while only 10 percent of the developmental group withdrew. A slightly higher percent (17 percent) of the college level technical mathematics students withdrew as compared to 15 percent of the developmental mathematics students.

Michaels (1986) found 76 percent completion rate for the Crossover Program students at the end of the first semester. When the Crossover students were compared with non-Crossover students, 38 percent of the Crossover students who entered in the fall of 1981 were still in school in the spring of 1984. This compares with 27 percent for non-Crossover students. The Crossover students had a mean GPA of 2.31 as compared with a mean GPA of 2.88 for the non-Crossover students.

Brophy (1984) found that of the 1,760 students in his study, 649 (37 percent) did not return for the second semester and approximately 200 more dropped out during the second semester. This gave a 52 percent retention rate for the first year. The dropout was characterized as a female over thirty years of age with a slightly lower GPA who had attempted and completed few courses. It was also noted that the typical dropout had a non-transfer, occupational, or two-year degree objective. Sixty-five percent of those who dropped out failed to complete a single course. Brophy also noted that there was no statistical significance between retention rates and such factors as gender, race, educational goal, length of time required to complete the educational goal and the number of counseling sessions.

Spangler (1981) concluded that those who were recommended out of the developmental courses into university-parallel courses had a much higher (12 percent) retention rate than that of the group as a whole. Roueche (1984) summarized a study of all colleges and universities with N=1,452 (58 percent) responding. It was found that approximately 15 percent of the entering freshmen were placed in developmental studies with approximately 33 percent of those completing the work in one term (either a semester or quarter).

Hobbs (1989) reported that since the fall of 1985, 790 students had successfully completed the developmental studies requirement at Shelby State Community College and were currently enrolled in college level courses. In the fall of 1988 there were 646 full-time freshmen in the developmental program and 487 (75 percent) of these returned in the spring of 1989. Similar results had been noted for the fall 1985, when 489 entered and 388 (79 percent) of these returned in the spring 1986.

Cox (1985) concluded that 74 percent of the developmental students who were enrolled at San Joaquin Delta College (CA) in the fall of 1984 returned in the spring of 1985. The retention rate for the developmental student exceeded the college population return rate by 8 percent.

Boylan (1983) cited several studies (pg. 19-20) that showed that those students who participated in a developmental program were retained at a higher rate than those who did not. Boylan concludes that:

> The review of the literature, research, and programs reports did not find a single instance where participation in a developmental program was associated with lower rates of retention. All evidence reviewed suggests the participation in a developmental program is associated with higher rates of retention (p. 20).

Budig (1985) noted that at Vincennes University the retention rate for the developmental population was approximately 84 percent at the end of the first semester while the retention rate for the regular student population was 88 percent. At the end of the second semester the rates were 56 percent for the developmental population and 63 percent for the regular population. Budig also concluded that 21 percent of the developmental students graduated as compared with 34 percent for the entire student population.

It would appear from the research that developmental programs enhance retention, although not all studies would support this.

Success of Developmental Students vs non-Developmental Students

In a study by Spangler (1983) the success rate of the developmental students who followed their instructor's recommendation was 85 percent as compared with 67 percent for the rest of the college. Spangler defined success as a 2.00 or better GPA as well as completion of at least one-half of the hours attempted.

Suter (1983) found that those who finished the developmental basic communication before attempting the college level basic communication earned approximately 48 percent of the A's, B's, and C's grades in the college level basic communications. Those who finished the developmental technical mathematics course earned approximately 67 percent of the A's, B's, and C's in the college level mathematics. This seemed to support the hypothesis that the completion of the developmental sequence enhanced the chance of a better grade in a comparable college level course. Suter also

concluded that the GPA of those who finished a developmental course was 2.38 as compared with 2.32 for those who had not completed a developmental course (Table 2, p. 13).

Nunley (1981) showed that the developmental studies student had a significantly higher GPA than a comparable group of non-developmental students. This was particularly evident at the end of the first semester. Gains were not evident during the second semester.

Basonic's (1982) study revealed that the forty developmental students who dropped out of college at the end of the first semester had a GPA of 0.77 and had earned only 31 percent of the credits attempted and those who left at the end of the second semester had a GPA of 1.20. Those who persisted for more than three semesters had a GPA greater than 2.00 and had earned more than 70 percent of the credits attempted (pp. 50- 51, tables 17,18). Cox (1985) found that developmental student succeeded "quite well". Two hundred thirty-one (75 percent) of the developmental students had completed 1413 units with a GPA of 2.25 (Table 4, p.13).

Boylan (1983) cited a number of studies in the late 1970's and early 1980's (pp. 16-18) concluded that those students who participated in a developmental program were more likely to obtain a higher GPA than admission tests would predict and a higher GPA than similar students who did not participate in such programs. Gordan (1983) showed that one group (Level 2) had a significantly higher GPA, while for another group (Level 1) there was no difference in the GPA between those who had taken a developmental reading course and those who had not.

Ferguson (1991) stated that 31 percent of LSU's graduates had taken at least one developmental course, generally mathematics. The author

stated that approximately 16 percent (466) of the entering freshmen who were placed in developmental courses during the 1982-1986 period graduated over a four year period (1986-1989). A majority of these had a composite ACT score of seventeen or less. These students had taken an average of 10.2 semester to graduates and 75 percent had a GPA of 2.60 or less. Nine percent (forty-one) of these entered graduate school.

The research was mixed as to the effect of the developmental programs on the overall GPA. However, there was a strong indication that developmental courses enable students to make better grades than would be expected or possible without such courses for those whose background was weak. There was a factor that was not touched upon in this study that was very important to the success of the developmental student, and that was motivation.

Summary

The literature dealing with developmental programs was found to be extensive. This literature reviewed individual courses and entire programs. The research focuses more on the characteristics of the developmental student than on the success of developmental programs. The identification of the developmental student involved a number of factors and colleges who have open door policies must be alert to these factors. Identification of the developmental student generally involved the use of testing. Whether these tests were in-house or commercial was not significant. The use of high school transcripts, ACT scores , and the student's own

assessment of his/her educational level did not greatly improve the identifications of the developmental student.

Most of the reports indicated that developmental programs in general were successful in doing what they are supposed to do, which was, enabling the underprepared student to be successful in college-level work. It was not possible to measure all the variables that attribute to success in college and therefore many of the studies dealing with only a limited numbers of variables must be viewed critically.

CHAPTER III

METHOD

Hiwassee College has had a developmental program known as Human Potential Clinic since the 1969-70 academic year. However, this study reviewed the program over the last ten years from 1980 to 1989 and dealt specifically with the fall 1989 freshmen class.

The program over the years has consisted mainly of developmental English (reading and writing) and developmental mathematics. Through teacher changes, textbook changes, and approach changes the program has retained essentially the same purposes. The primary purpose of the developmental program has been to enable the underprepared student to be successful in college level courses, specifically English and mathematics. The courses are described practically the same in the 1989 catalogue as in the 1969 catalogue.

As the result of a federal grant, the developmental program in 1989 had two "wings." Both wings were the same in content, structure, and approach. One wing was operated using federal funds and a second wing was operated using institutional funds. The mathematics courses consisted of two parallel courses, one taught by staff paid by the institution and another taught by staff under the federally funded program. Appendix C contains a syllabus for each of these courses.

Students were enrolled in all courses at Hiwassee college after consultation with a faculty advisor in the student's area of interest. The

faculty advisor reviewed with the student his/her high school academic record, the recommendation of the Developmental Studies Committee, the student's ACT or SAT scores, and his/her condition of admission. The Admission Committee as a condition of admission could suggest, recommend, or require one or more developmental course. The Developmental Studies Committee recommended courses for the student in the areas of mathematics and English based on the student's freshmen week testing (ASSET and writing sample). Students could ignore the recommendation of the Developmental Studies Committee but could not ignore a requirement of the Admission Committee.

Developmental courses were basically offered under their respective academic divisions. That is, the English department was in charge of the developmental writing and reading, while the mathematics department was responsible for the developmental mathematics. There has been very limited sharing or coordination of the individual student's progress and performance, although there has been monitoring of student's attendance and progress in individual courses. Goals of the developmental program are contained in this chapter.

Population

The population consisted of the fall 1989 freshmen students at Hiwassee College. From this population international students were eliminated since they would not have taken the ACT or provided other information needed for this study. This remaining population was divided into two groups as follows:

Developmental--those full-time fall 1989 freshmen students who had enrolled in one or more developmental course. These students would be enrolled in the equivalent of at least twelve hours of college credits.

Non-developmental--those full-time fall 1989 freshmen students who were not enrolled in any developmental course. These students would be enrolled in at least of twelve hours of college level credits.

At the beginning of the spring 1990 semester the developmental group formed two subgroups--those who had completed their developmental courses, and those who continued with a developmental course. These three groups described below were tracked through the spring 1991 semester.

Group IA were those students who finished the developmental requirements in one semester. Group IB were those students who required more than one semester to complete the required developmental requirements. Group II would those students who were not enrolled in any developmental course. Students in all three groups were enrolled as full-time students, i.e. taking the equivalent of twelve hours of college credits.

Developmental Courses

The developmental program in the fall of 1989 consisted basically of three courses supplemented by a learning and counseling laboratory. The method of instruction was self-paced in all courses. Each course carried three hours of institutional credit. The grading scale was A, B, C, P, and F, with the P grade meaning making progress. It was not intended that the "P" mean passing. Each letter grade was prefixed by "DS" for developmental studies. Copies of the syllabi are contained in Appendix C.

Developmental mathematics program.

The mathematics program consisted of two parallel courses using the same textbook/workbook. Mathematics 0100 and Mathematics 0110 were taught under the federal funded program, while Mathematics 0980 and 0990 were taught by staff paid out of institutional funds. Mathematic 0100 was the same course as Mathematics 0980. Courses are described in more detail below.

Math. 0100 Two sections were taught under a federally funded program where the class met in a regular classroom two days per week and in laboratory setting one day per week. Course content began with arithmetic of the whole numbers and worked though high school algebra one. Class work as well laboratory work was self-paced. This course was designed for those who it was felt would require two semesters to remove their mathematics deficiency before attempting college algebra.

Math. 0110 Taught by the same method as Math 0100 but was designed for those students who it was felt could remove their math deficiency in one semester. Course content was essentially high school Algebra II.

Math. 0980 Two sections taught by the same method as Math. 0100, but without a formal lab session. Expense of the course was borne by the College. The instructor offered to the students extra time (labs). Topics covered were the same as Math 0100. This course was designed for those students who it was felt would

require two semesters to remove their mathematics deficiency.

Math. 0990. This course was basically the same as Math 0110 but with the cost borne by the College.

Developmental English program.

The developmental English program consisted of two courses--English 0880 and English 0980. English 0880 was a reading course and English 0980 was a writing course. These courses are described below.

English 0880. Reading. Principles and practices of effective reading, reading and comprehension, skim reading, textbook reading, vocabulary building, effective study skills, reading from major writers. Course carried three hours of institutional credit.

English 0980. Writing/Communication Skills. Principles and practices of effective writing, frequent themes and exercises in grammar and mechanics. This course carried three hours of institutional credit.

Goals of the Developmental Program

The goals of the developmental programs consisted of the following:

1. To offer developmental (remedial) courses in mathematics and English that would enable the developmental student once having completed the developmental course(s) to have a successful experience in regular college courses.

2. To provide to the student study skills and motivational courses that would enable them to gain the self-confidence for success in college.

3. To provide supplementary computer support laboratory services in the above areas (English, math, and study skills).

4. To assist the admission office of the college in recruiting eligible participants for the program.

5. To identify students who required special academic services in order to succeed in college.

6. To inform the faculty about the needs of their advisees and students in their classes. (Those advisees who were developmental students.)

7. To design advisement and instructional strategies to meet the identified needs of developmental students.

8. To develop a computerized tracking system that can monitor the progress of each student from admission to exit.

Sources of Data

There were four primary sources used to collect data for this study. First, the college catalogues and class schedules (timetables) were reviewed to determine the background information on the developmental program. For background information the class schedules for the past ten years were examined as to the number of students enrolled and which developmental courses were offered. The college catalogues for the past ten years were reviewed to determine the number of developmental courses offered and the nature and content of these courses. Class rosters for the past ten years were also reviewed to determine the number enrolled in the developmental courses.

Second, the college data base was used to gain entrance and exit information on the fall 1989 freshmen students. This entrance information consisted of high school GPA, ACT or SAT scores, gender, ethnic origin,

and age. Freshmen week testing scores on ASSET and the writing sample were also secured from this data base.

The third source of information was the students' academic records. From this source of information classification as developmental or non-developmental was extracted. Also information on the number of college-level hours attempted, college-level hours completed, and college GPA was obtained. The attrition rates of the two groups--developmental, non-developmental was obtained from this source.

The fourth source of information was a researcher developed questionnaire. (A copy of the questionnaire appears in Appendix A.) This questionnaire was administered to the group of freshmen from the fall of 1989 who had enrolled in one or more developmental course and who were still enrolled at Hiwassee College in the spring of 1991. There were forty-seven students who met this classification and useable responses were obtained from twenty of these. The purpose of this questionnaire was to gain information on the effectiveness of the developmental program. Did the developmental course(s) aid the student in meeting his/her educational goals?

Procedures

The procedures consisted of comparison of the information on the developmental group with corresponding information on the non-developmental group. Entrance data of high school GPA, gender, ethnic origin, and ACT scores were used to obtain a profile of the two groups--developmental and non-developmental.

The freshmen week testing scores on the ASSET test and writing sample were used to compare the two groups. Information from the academic records was used to compare the two groups as to the number of hours of college-level work attempted, the number of hours of college-level work completed, and the college GPA of each group. The success of the developmental groups in developmental courses and in corresponding college-level courses were analyzed. Comparisons of the scores on the ASSET test and grade in developmental and non-developmental courses were made.

More specifically, the data were analyzed in the following ways:

1) The ACT in math was compared with the grade earned in Math 0980, 0990, and/or 1110.

2) The ACT in English was compared with the grade in English 0880, 0980, and/or 1010.

3) ASSET numerical and algebra scores were compared with grade in Math 0980, 0990, and/or 1110.

4) ASSET language usage scores were compared with the grade in English 0880, 0980, and/or 1010.

5) The high school GPA was compared with the college GPA for all three groups.

6) The GPA of the three groups was calculated and compared at the end of the fall 1989 semester, at the end of the spring 1990 semester, and at the end of the spring 1991 semester.

7) The attrition rates and graduation rate were calculated for the three groups.

8) The hours attempted and hours completed were compared for the three groups.

9) Grades in Math 0980/0100 and Math 0990/0110 were compared with Math 1110 (college algebra).

Information from the student questionnaire was summarized to obtain information on the students' perception of the effectiveness of the

developmental program. This questionnaire also gave information about students' attitudes before and after taking a developmental course.

Summary

The procedure consisted of comparisons of the variables in Chapter I for the three groups. Two groups--developmental and non-developmental were compared as to high school GPA, gender, ethnic background, and freshmen week testing to obtain a profile to the groups at the beginning of the fall 1989.

At the beginning of the spring 1990 semester the developmental group formed two subgroups--those who completed developmental studies in one semester and those who required two semesters to complete developmental courses. This led to three groups for the continuation of the study through the spring 1991 semester. These three groups were compared at the end of the spring 1990 semester and at the end of the spring 1991 semester as to the number of hours attempted, hours completed, and GPA. The graduation and attrition rates for the three groups were also compared. The purpose of this study was to determine the impact of the developmental program on the developmental students.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

The purpose of this chapter is to present and analyze the results of the previously described data sources based on the questions presented in Chapter I. The chapter will be divided into seven main sections: 1) the history of developmental program at Hiwassee College, 2) characteristics of the developmental and non-developmental students at Hiwassee College the fall 1989 semester, 3) the results of the fall 1989 freshmen week testing and advising, 4) performance of the fall 1989 semester developmental students, 5) comparison of the success of the three groups in terms of hours attempted, hours completed, and college grade point averages (GPA) at the end of the fall 1989 semester, at the end of the spring 1990 semester, and at the end of the spring 1991 semester, 6) attrition rates by semester and graduation rates for the three groups, and 7) analyses of the information obtained from the student questionnaire.

Each section will address one or more of the specific research questions on pages 7 and 8 of Chapter I.

The Developmental Program at Hiwassee College

This section discusses Subproblem 1 which was to obtain a detailed description of the evolving developmental program at Hiwassee College over the past ten years. Hiwassee College has had a developmental program for

the past twenty years. The developmental program has gained new emphasis over the past five years. As early as the school year 1969-70 Hiwassee College had a developmental program known as the Human Potential Clinic. Under the Human Potential Clinic, courses in small group dynamics, study skills, mathematics, writing, and literature were offered. There was also a reading laboratory. These courses were available to all students and were non-credit. They were designed to "help him (the student) find and experience greater success today as well as in the future." (Hiwassee College catalogue, 1969-70, p. 72). Courses were designed to be a single quarter course. Human Potential course descriptions are found in Appendix B.

The literature course and the reading laboratory were dropped from the Human Potential program in the 1970-72 catalogue. It was noted that credit could be earned for freshmen English 101 in the human potential writing course. Course notation was "HP" for human potential. A Roman numeral were used in numbering developmental courses.

There were a number of changes in the human potential clinic program in the 1972-74 college catalogue. The small group dynamics and the study skills courses were renamed as psychology courses with the same course description. A course entitled high school study skills was added to the program. Numbering was changed to Arabic numerals. The writing course became developmental English. This was the first reference to the word developmental. Course descriptions in the catalogue were essentially the same as in the 1969-70 catalogue.

In the 1979-81 college catalogue the Human Potential Program consisted of the five courses--high school study skills, small group

dynamics, study skills, developmental English (writing), and developmental mathematics. Both the developmental English and developmental mathematics carried the notation that college credit could be earned in these courses. Courses were available to all students. The mathematics course was designed to meet the prerequisite for college-level mathematics, which carried the requirement of one year of high school algebra.

In the 1981-83 catalogues the developmental courses consisted of study skills, developmental English (writing), and developmental mathematics. The study skills and developmental English courses were offered under the English department and the developmental mathematics under the mathematics department. Admission to these courses was through an in-house testing program, and there was a strong hint that such courses were "required" for the less prepared student. In the fall of 1981 all students with an ACT of 12 or below in mathematics were required to enroll in developmental mathematics. That year 127 students (24 percent) were enrolled in developmental mathematics. Courses continued with essentially the same descriptions as in the 1969-70 catalogue. There was no record as to the success of the human potential (developmental) program in terms of completion of the developmental program, retention, success in college-level courses, or graduation rates.

In the early eighties, a small federal grant was received by the College to hire a full-time person in developmental mathematics and a second person to do some counseling and advising of developmental students or weaker students. The human potential notation was dropped, with the courses listed as developmental courses under the respective departments. The program was expanded to three quarters (one year).

The developmental English 98-99-100 had the title "Principles of Effective Writing." The developmental mathematics was expanded to three quarters with the first quarter being devoted largely to arithmetic and the third quarter devoted to intermediate algebra. A student could enroll in any of the six courses. Placement by testing became routine. There is no indication of follow up of these students as to dropout or success in college-level courses.

In the 1986-88 catalogue, developmental courses consisted of a reading course, a course in motivation and study skills, and a course in preparatory chemistry in addition to developmental English (writing) and developmental mathematics. Limited tracking in terms of retention and success in college level courses was initiated. Courses were basically taught in the traditional college lecture-discussion format.

The college changed to the semester system during the academic year 1988-89. The developmental English program consisted of two one-semester courses--one in reading and a second in writing. The developmental English courses had the title Developmental Communication Skills I, II-Effective Reading and Writing. A student could enroll in either or both of these courses. The developmental mathematics courses were Math 0980-introduction to algebra, and Math 0990-intermediate algebra. The developmental program remained the same except that courses were now two semesters instead of three quarters. The testing program was expanded to include the ASSET testing and a writing sample. All developmental courses now carried institutional (Hiwassee) credit.

In the fall of 1986 as part of a larger federal grant received by Hiwassee College the developmental program receive adequate funding which

permitted program improvements. Program improvements included a student support laboratory, additional materials, and sufficient staffing. The program now had clearly defined goals and objectives.

As the result of this grant the developmental program had two "wings," with one wing operated out of institutional funds and a second wing operated out of grant funds. These wings were essentially the same in content. The grant funded wing required students to meet certain criteria in order to be in the program. In addition a laboratory period was required of students in this wing of the program. The grant funded wing was called an "activity" with its own director, while the institutional funded wing was operated under the respective departments. The institutional funded wing was taught by a member of the respective departments. Under the federally funded wing, developmental mathematics courses were numbered 0100 and 0110, while the institutional funded wing designated the mathematic courses by 0980 and 0990. Mathematics 0100 was the same in content and method as Mathematics 0980.

The placement in both wings was on the basis of the ASSET testing and writing sample along with the high school transcript and ACT scores. A greater effort was made to use the high school background in mathematics as part of the advising process for mathematics. The developmental curricula evolved over the next two years to include mathematics (Math 0980/0100 and Math 0990/0110), reading (English 0880), and writing (English 0980). A summary of the developmental enrollment for the past ten years is given in Table 1.

There are considerable discrepancies between the courses listed in the College catalogues and the courses offered in the class schedules.

Table 1

Number of Students Enrolled in Developmental Courses over the Past Ten Years

Fall Quarters or Semesters

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Student Pop.	536	498	520	460	518	544	475	468	470	431
Courses	Number Enrolled									
Math	127	53	26	34	83	64	60	101	113	82
Writing	83*	98*	44*	57*	37	22	37	58*	31	17
Reading					33	16	46		45	33
Study Skills						14				

*These numbers indicate enrollment in writing and/or reading.

Mathematics and writing were the most offered of the developmental courses. Mathematics had the highest enrollments. The study skills course was not offered on a regular basis. This was an indication that the developmental program at Hiwassee College was less functional than desired. There were some references in the syllabi that some of study skills were taught as part of the reading and/or writing courses. The developmental courses for the school year 1989-90 were described in Chapter III. Syllabi are in Appendix C.

Characteristics of the Developmental and non-Developmental Students; Fall 1989 Semester

The computer data base contained 318 files of fall 1989 freshmen students at Hiwassee College. From this list 38 had not enrolled, 46 had enrolled in the summer of 1989, 16 were international students, and 8 were part-time students. The above groups of students were eliminated from the study since they did not meet the criteria of the desired population. Of the 210 remaining students 106 (50.5 percent) were developmental students and 104 (49.5 percent) were non-developmental students.

Of the 106 developmental students 48 (45.3 percent) were male and 58 (54.7 percent) were female, while 50 (48 percent) of the 104 non-developmental students were male and 54 (52 percent) were female. The ethnic makeup of the developmental students were 81 (76.4 percent) Caucasian, 22 (20.7 percent) Black, 1 Hispanic, and 2 (1.8 percent) American Indian, and the ethnic characteristics of the non-developmental students

were 100 (96.2 percent) Caucasian, and 4 (3.8 percent) Black. There was a disproportionate number of blacks students in the developmental group.

The comparison of the high school grade point average (GPA) shows that the mean high school GPA of the developmental group to be 2.449 with a standard deviation of 0.535 (N = 83), while the mean high school GPA of the non-developmental group was 3.002 with a standard deviation of 0.590 (N = 89). This indicated a difference in the two groups. Not all students' records were complete enough to obtain a high school GPA. High school averages on the 100 scale were converted to the 4-point scale by means of a table provided by the University of Tennessee.

Only four of the 106 developmental students were not traditional age (18-20 year olds) college students. Five of the 104 non-developmental students were not in this age bracket.

Table 2 gives the distribution of American College Testing (ACT) scores in the areas of math, English, and composite for the developmental students. Similar information on the non-developmental students is shown in Table 3. More developmental students lacked complete ACT information, which might indicate that these students were late in deciding to enter college. These tables give the frequencies in each author selected ACT range. Some of both groups had taken the Scholastic Aptitude Test (SAT) and their SAT scores were converted to composite ACT scores. Table 2 shows that 17 (23 percent) students were in developmental mathematics who had math ACT scores above the cut off of 12. These may have elected to place themselves in a developmental mathematics course before attempting college algebra. From Table 3 it would appear that many more should have been in developmental studies based on ACT scores, particularly

Table 2

Distribution of the ACT Scores for the

Developmental Students at Hiwassee College

Fall 1989 Semester

ACT Ranges	1-4*	5-8	9-12	13-16	17-20	21-24	25-28	
Section			Frequencies					Mean
English N = 75	2	13	19	19	19	3	0	13.2
Mathematics N = 75	14	25	19	14	2	1	0	8.6
Composite N = 86	0	11	35	26	13	2	0	12.5

* Arbitrary ranges.

Table 3

Distribution of the ACT Scores for the

non-Developmental Students at Hiwassee College

Fall 1989 Semester

ACT Ranges	1-4	5-8	9-12	13-16	17-20	21-24	25-28	
Section				Frequencies				Mean
English N = 85	0	1	3	12	31	22	16	19.5
Math N = 86	4	11	15	15	23	13	5	15.2
Composite N = 94	0	0	10	27	25	24	8	18.2

developmental math. The mean ACT English score was 13.2 for the developmental group compared with 19.5 for the non-developmental group. A greater difference was noted in the mean ACT math scores where the developmental mean was 8.6 and the non-developmental mean was 15.2. The ACT composite means showed a difference from 12.5 for the developmental group to a 18.2 for the non-developmental group. This indicates a difference in the two groups. Twenty (18.9 percent) of the developmental students had no ACT or SAT scores and ten (9.6 percent) of the non-developmental students did not have these test scores. Table 4 provides the ACT information on the developmental students who returned the spring 1990 semester. These developmental students now form Group IA and Group IB. Group IA consisted of students who completed developmental courses in the fall 1989 and were enrolled in college-level courses in the spring 1990 semester. Group IB are those developmental students who continued their developmental course work during the spring 1990 semester.

The means of the two developmental groups (IA, IB) were approximately the same in English. However, there was a difference in the mean of the two groups in mathematics. This was as perhaps it should be since Group IB were those students needing two semesters to remove their mathematics deficiency. The composite mean of the two developmental groups were the same.

Table 5 summarized the ACT scores for those developmental students who dropped out the fall 1989 semester or did not return the spring 1990 semester. This table indicated that Hiwassee was loosing students

Table 4

Distribution of the ACT Scores for those Developmental Students Who Returned the Spring 1990 Semester

ACT Ranges	1-4	5-8	9-12	13-16	17-20	21-24	25-28	
Section	Frequencies							Mean
English								
Group IA (N = 23)	1	2	8	5	6	1	0	13.3
Group IB (N = 38)	1	8	8	9	10	2	0	13.1
Mathematics								
Group IA (N = 23)	2	9	5	6	0	0	0	9.2
Group IB (N = 38)	10	11	13	4	1	0	0	7.9
Composite								
Group IA	0	3	14	11	1	0	0	12.2
Group IB (N = 75)	0	8	16	14	6	2	0	12.2

Table 5

ACT Scores of Developmental Students Who Withdrew the Fall 1989 Semester or did not Return the Spring 1990 Semester

ACT Ranges	1-4	5-8	9-12	13-16	17-20	21-24	25-28	
Section	Frequencies							Mean
English (N = 14)	0	3	3	5	3	0	0	13.0
Mathematics (N = 14)	2	5	1	4	1	1	0	10.6
Composite (N = 15)	0	1	7	3	4	0	0	13.6

from its developmental program that have better ACT's than many of the developmental students that it was retaining. This was particularly evident in mathematics where the mean of those that returned was 8.5 and for those that withdrew the mean was 10.6.

At the beginning of the spring 1990 semester 34 of the fall 1989 developmental students returned and enrolled in college-level courses, thus having completed their developmental courses. These students formed Group IA. Forty-nine of the developmental students continued with developmental courses. However, only one of the developmental students continued with developmental reading and no one continued with developmental writing. These developmental students formed Group IB. For the purpose of this study Group IB were those students who enrolled in Math 0990/0110 during the spring 1990 semester, having taken developmental Math 0980/0100 in the fall 1989.

Results of Freshmen Week Testing and Advising

The freshmen week testing consisted of the ASSET test battery and writing sample. The ASSET test gave information on language (English) usage, reading level, and numerical skills. In addition, Hiwassee administered the elementary algebra portion of the ASSET to all freshmen. The language usage had a time limit of 11 minutes with a maximum score of 64. The reading level test had a time limit of 20 minutes and contained 40 items. The numerical skills portion had a time limit of 18 minutes and contained 32 items ranging from arithmetic to elementary algebra. The elementary algebra test had a time limit of 25 minutes and had 25 items.

The writing sample was an impromptu essay that was administered by the English faculty. Students were given approximately 20 minutes to complete the essay.

Table 6 presents the results of the ASSET language usage test for the developmental and non-developmental groups. Information was not available on all students. There were more incomplete scores for students in the non-developmental group. Three of the developmental group either failed to take the ASSET test or scores were incomplete. Twelve of the non-developmental group either failed to take the ASSET test or scores were incomplete. This table indicates major differences in the two groups. The mean of the Language Usage score for the developmental group was 43.0 and the mean for the non-developmental group was 50.9. From the means of the two groups, Hiwassee was doing a good job of identifying those who were in need of developmental courses.

Table 7 summarizes the ASSET reading scores for the two groups-developmental and non-developmental. Three of the developmental group had no reading score while a total of seventeen of the non-developmental group had no reading scores. It was highly likely that some of the writing scores for the non-developmental group were not recorded since more had taken the language usage portion of the test. One can only guess if these would have been placed differently if their scores had been available. The ASSET reading mean score for the developmental group was 22.3 as compared with 29.8 for the non-developmental group. This test also indicated a difference in the two groups--developmental and non-developmental.

Table 6

Results of the Language Usage Scores* of the

ASSET Test for the Two Groups

Ranges	20-26	27-33	34-40	41-47	48-54	55-61
	Frequencies					
Developmental (N = 103)	4	6	24	39	26	4
Non-Developmental (N = 92)	0	0	2	18	46	26

* Maximum score was 64

Table 7

Results of the Reading Scores* of the ASSET

Test for the Two Groups

Ranges	9-13	14-18	19-23	24-28	29-33	34-40
	Frequencies					
Developmental (N = 103)	19	20	12	28	15	9
Non-Developmental (N = 87)	1	5	10	17	23	31

* Maximum score was 40.

Table 8 shows the ASSET test numerical portion scores for the two groups. Ten of the non-developmental group had no numerical scores. The ASSET mean numerical score for the developmental group was 16.3 while the mean of the non-developmental group was 22.6. This is a difference of 6.3 in the means ASSET numerical scores for the two groups.

Table 9 gives the scores on the ASSET test algebra portion for the developmental and non-developmental groups. The ASSET mean algebra score for the developmental group was 7.8 as compared with 12.4 for the non-developmental group. This represented a marked difference in algebra skills for the two groups. Sixteen of the developmental and 19 of the non-developmental group had no ASSET algebra scores.

The writing scores are shown in Table 10. The writing sample was graded on the basis of one (poor) to five (excellent). This table gives the frequencies for each score for each group. The mean of the developmental group was 2.71 (N = 101) compared with a mean of 3.06 (N = 88) for the non-developmental group. This would indicate a clear difference in the writing abilities of the two groups. There was a marked difference in the standard deviation of the two groups, namely 0.73 for the developmental group and 0.63 for the non-developmental group. This would indicate a greater difference within the developmental group. It should be noted that there were very few ones (3) given for both groups and only one five. This would indicate that the writing sample scores of the population did not fit the standard bell-shaped curve. Again not all students in each group had a writing sample score. This test may not be as good a differentiator as one would have hoped.

Table 8

Results of the Numerical Scores* of the ASSET

Test for the Two Groups

Ranges	5-9	10-14	15-19	20-24	25-29	30-34
	Frequencies					
Developmental (N = 103)	3	32	33	22	4	0
Non-Developmental (N = 94)	1	7	12	41	25	8

* Maximum score was 32

Table 9

Results of the Algebra Scores* on the ASSET

Test for the Two Groups

Ranges	2-5	6-9	10-13	14-17	18-21	22-25
			Frequencies			
Developmental (N = 88)	20	44	21	2	0	0
Non-Developmental (N = 85)	3	22	26	25	8	1

* Maximum score was 25

Table 10

Results of the Writing Sample of the

Developmental and non-Developmental Students at

Hiwassee College, Fall 1989 Semester

Scores	1	2	3	4	5
		Frequencies			
Developmental Group (N = 101)	2	35	52	10	1
Non-Developmental group (N = 88)	1	11	56	20	0

The writing sample was graded by at least two full-time members of the English faculty at the College. A composite score that ranged from one (poor) to five (excellent) was assigned to each essay. Grade was based on grammar, punctuation, and general sentence and paragraph construction.

In each of the categories above--ACT scores, ASSET reading scores, ASSET language usage scores, Asset numerical scores, and writing sample scores, there is a noticeable difference in the mean scores on each test for the two groups. This indicted that the two groups were being identified and that all the tests were in general agreement on the placement of students.

Table 11 contains information on students' choices of major or curriculum. There was only minor differences in the choice of majors by the developmental and non-developmental students. Both groups were distributed almost identically as to majors. Even the "undecided" were the same. In some cases students may have had some prior knowledge of the advisor in a particular area and made their choice based on that information. This could have been a greater factor in the non-developmental group since they were more likely to have made college inquires.

Table 11

Majors for Developmental and Non-Developmental Students;

Freshmen Class 1989

Major	Developmental	Non-Developmental
Aerospace	1	2
Agriculture	3	4
Accounting	0	1
Business Adm.	17	17
Communication	4	2
Engineering	1	3
Liberal Arts	9	10
Pre-Dental	0	1
Pre-Medical	5	11
Music	6	3
Pre-Therapy	4	1
Phys. Ed.	3	0
Undecided	13	13
Computer Science	6	1
Education	15	18
Human Service	6	2
Pre-Law	3	2
Nursing	4	3
Home Ec.	4	1
Pharmacy	0	1
Equestrian	1	5
Industrial Ed.	1	2
Total	106	104

Performance of the Developmental Students

Figure 1 gives the distribution of the developmental students in the developmental courses. The largest number (100) of students were enrolled in mathematics. It is noteworthy that more than half (56 or 52.8 percent) were in developmental mathematics only. The next largest number (18 or 17 percent) were taking all three developmental courses. There were total of 46 (43.3 percent) taking two or more developmental courses. Twenty students were enrolled in both reading and writing. There were only two students each in reading and writing. There was no further tracking of these students in their developmental studies.

Table 12 gives the course enrollment and grades earned in the developmental courses for the fall 1989 semester. Students had greater difficulty in earning a passing grade in mathematics. The DSP grade indicated that the student was making progress but not satisfactorily completed sufficient work to warrant a passing grade. Twenty-three (23 percent) of the developmental math students were successful in their first developmental math course. Sixty (60 percent) of the developmental math students received a DSP grade.

Twenty-seven (87 percent) of the developmental reading students were successful and 24 (64.9 percent) of the writing students were successful. Seventy-four (44 percent) passing grades were earned by the developmental students. All but two of the developmental students persisted to the end of the semester and these two withdrew from mathematics. The developmental students failed 12 (11.4 percent) of the developmental courses attempted.

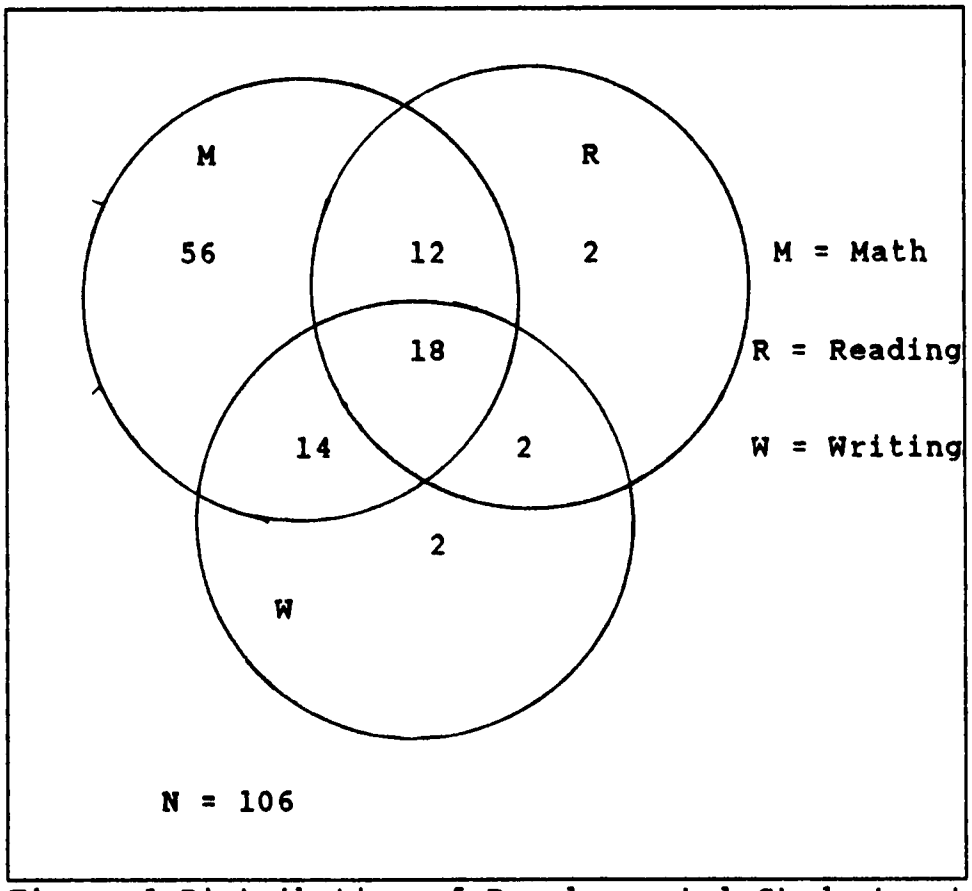

Figure 1 Distribution of Developmental Students at Hiwassee College in Developmental Courses Fall 1989 Semester

Table 12

Grades Earned by the Developmental Students in Developmental Courses; Fall 1989 Semester

Grades	A	B	C	DSP	F	I	W
Course	Frequencies						
Math 0980/0100	9	8	1	60	4	2	2
Math 0990/0110	3	1	1	5	2	2	0
Reading	2	8	17	3	1	0	0
Writing	2	12	10	7	5	1	0

Of the 11 who earned a DSP in Math 0990/0110 during the spring 1990 semester, 4 passed college algebra, one failed college algebra, 4 withdrew from college, and 2 were still in college the spring 1991 semester but had earned no college level mathematic credits. Of the 16 who had a F's in Math 0990/0110 two passed college algebra, two failed college algebra, 7 withdrew from college, and 5 had not attempted a college level mathematics course through the spring 1991 semester.

Question 2 (Chapter I, page 7) asks: What was the length of time required to complete the developmental curricula before attempting college level work? Approximately 25 percent of the developmental students who continued in college required two semesters to remove their mathematics deficiencies. Forty percent had not removed their mathematics deficiency at the end of two semesters. Essentially all removed their English deficiencies in one semester. These data are in Table 12.

Table 13 gives the distribution of grades earned by developmental students (Group IB) who enrolled in Developmental Mathematics 0990/0110 in the spring 1990 semester. Those who had earned a passing grade in Math 0980 either enrolled in college algebra in the spring 1990 or withdrew from college. Only those making grades of DSP or F in Math 0980/0100 were enrolled in Math 0990/0110. It should be noted that there was a relative high number of DSP's (11 or 22.4 percent) and the even higher number of F's (15 or 30.6 percent). Eighteen (35.4 percent) were successful.

Table 14 summarizes the grades earned in college Algebra 1110 by the developmental group after completing Developmental Math 0980/0100. The number of students who were successful in college algebra

Table 13

Grades Earned by Developmental Students

in Math 0990/0110 After Taking

Math 0980/0100

Grades in Math 0990/0110		A	B	C	DSP	F	I	W
				Frequencies				
Math 0980/0100	DSP	9	6	3	11	15	1	3
grades	F	0	0	0	0	1	0	0

Table 14

Grades Earned by Developmental Students in College Algebra (Math 1110) After Taking Math 0980/0100

		Grades in College Algebra (Math 1110)						
		A	B	C	D	F	I	W
		Frequencies						
Grades in math 0980/0100	A	0	0	2	2	0	0	2
	B	0	3	1	0	1	0	3
	C	0	0	2	0	0	0	0
	DSP	0	1	2	1	2	0	1
	F	0	1	0	0	1	0	0

N = 25

indicated that many of these students should have completed Mathematics 0990/0110 before attempting college algebra. Fourteen (56 percent) of this group were successful in college Algebra 1110. Nineteen (76 percent) persisted to the end of the semester.

Table 15 gives the grades earned in college algebra after taking developmental mathematics 0990/0110. Three of these had taken Math 0990 in the fall 1989 and the others took Math 0990/0110 in the spring 1990. This indicates that Mathematics 0990/0110 was not adequate preparation for college algebra. There were three who withdrew from the course. Seventeen (85 percent) persisted to the end of the course. Fifteen (60 percent(of this group were successful in college algebra. Five who were unsuccessful in Math 0990/0110 were successful in college algebra.

Table 16 summarizes the grades in freshmen English 1010 for those developmental students who completed Developmental Reading 0880. Twenty-four (93.3 percent) of this group were successful in freshmen English. Twelve (46 percent) of this group were enrolled in freshmen English concurrently with the developmental reading course. All students persisted to the end of the course. Fifty percent of those earning a C in English 0880 received D's or F in English 1010.

Table 17 presents the grades in freshmen English of those developmental students who completed Developmental Writing 0990. Twenty-three (79.3 percent) of this group were successful in freshmen English 1010. Eleven (37.9 percent) of this group were enrolled in freshmen English concurrently with the developmental writing course. All students persisted to the end of the semester. Fifty percent of those who

Table 15

Grade Earned in College Algebra (Math 1110)

After Taking Developmental Math 0990/0110

Through the Spring 1991 Semester

		Grade in College Algebra (Math 1110)						
		A	B	C	D	F	I	W
		Frequencies						
Grade in	A	1	1	2*	2*	0	0	0
math 0990/0110	B	0	1	0	0	0	0	1
	C	0	0	0	0	0	0	0
	DSP	0	2	2	0	2	0	2*
	F	0	0	1	0	2	1	0

* One from each of these categories took Math 0990 in the fall 1989.

Table 16

Grades Earned in Freshmen English (English 1010)

After Taking Developmental Reading--

English 0880

		Grade in Freshmen English 1010						
		A	B	C	D	F	I	W
		Frequencies						
Grade in Reading	A	0	0	1	1	0	0	0
(English 0880)	B	0	1	5	1	0	0	0
	C	0	1	7	7	1	0	0
	DSP	0	0	0	0	1	0	0

Table 17

Grades Earned in Freshmen English (English 1010)

and Grades Earned in Developmental Writing--

English 0980

		Grade in Freshmen English 1010						
		A	B	C	D	F	I	W
		Frequencies						
Grade in Writing	A	0	2	0	0	0	0	0
	B	0	6	2	1	0	0	0
	C	0	0	4	5	0	0	0
	DSP	0	0	1	2	3	0	0
	F	0	0	1	0	2	0	1
	W	0	0	0	0	1	0	0

N = 31

earned a DSP in English 0990 received an F in English 1010. Eighteen of the developmental group were enrolled in both developmental writing and developmental reading. Four from the developmental group were enrolled in developmental reading, developmental writing, and freshmen English during the fall 1989 semester. Eight students took developmental reading but did not take freshmen English 1010. Seven students finished developmental writing but did not take freshmen English 1010.

Comparison of the Performance of Each Group

Table 18 exhibits the grades earned by developmental students in developmental Math 0980/0100 or 0990/0110 and their ASSET test numerical portion scores. Four of the developmental mathematics students had no ASSET numerical test scores. These were students in developmental mathematics by choice. Six (16.2 percent) of those with numerical ASSET scores of 14 or below were successful in developmental math. Seven (23.3 percent) of those with ASSET numerical of 20 or above were successful in developmental math. The overall success rate was 22.6 percent (21 out of 93). There were three in this group who had ASSET numerical scores of 25 or above and all three received a DSP.

Table 19 shows the grades earned by the non-developmental students in college algebra (Math 1110) and their ASSET test numerical portion scores. The notation "NM" was used to denote that these students had completed "no college-level mathematics" course at the end of the spring 1991 semester. Twelve of this group had attempted no college-level

Table 18

Grades Earned by Developmental Students in Developmental Math 0980/0100 or 0990/0110 and Their ASSET Test Numerical Portion Scores

Fall 1989 Semester

		Grade in Math 0980/0110 or 0990/0110						
		A	B	C	DSP	F	I	W
		Frequencies						
ASSET	5-9	0	0	0	8	0	0	0
test	10-14	4	2	0	21	2	0	0
Ranges	15-19	4	2	1	21	0	3	0
	20-24	1	5	2	12	2	1	2
	25-29	0	0	0	3	0	0	0
	30-34	0	0	0	0	0	0	0

N = 82

Table 19

Grades Earned by non-Developmental Students in College Algebra (Math 1110) and Their ASSET Test Numerical Portion Scores

Fall 1989 Semester

		Grade in College Algebra (Math 1110)							
		A	B	C	D	F	I	W	NM*
		Frequencies							
ASSET	5-9	0	1	0	0	0	0	0	0
Test	10-14	1	0	2	0	0	0	0	4
Ranges	15-19	0	3	1	2	1	1	0	3
	20-24	0	9	11	8	3	1	4	4
	25-29	5	8	6	4	0	1	1	1
	30-34	2	2	1	1	1	0	1	0

*NM denotes that these students had attempted no college level mathematics through the spring 1991 semester.
N = 83

mathematics at the end of the spring 1991 semester. All four of those with a numerical ASSET score of 14 or below were successful in college algebra. Fifty-seven (82.6 percent) of those with a numerical ASSET score of 20 or more were successful in college algebra. The overall success for this group was 82.7 percent (67 out of 81). The higher the numerical ASSET score the more likely that a student would be successful in college algebra. This indicates that the numerical ASSET test score was a good predicator of success in college algebra.

Table 20 displays the grades earned by developmental students in Developmental Math 0980/0990 or 0990/0110 and their ASSET test algebra portion scores. It was very difficult to assess the relationship between these two scores since there were a large number (58) of DPS grades assigned. The overall success rate was 25.3 percent. Table 21 shows the grades earned by the non-developmental students in college algebra (Math 1110) and their ASSET test algebra portion scores. Thirty (85.7 percent) of those with ASSET algebra scores of 13 or greater were successful in college algebra. The overall success rate for the non-developmental group was 82.4 percent.

Table 22 presents the grades earned by the developmental students in developmental English 0980 (Writing) and their ASSET language usage portion scores. Six (85.7 percent) of those with a language usage score of 33 or less were successful in English 0980. Five (50 percent) of those with a language usage score of 41 or above were successful in English 0990. The overall success rate was 51.5 percent (17 out of 33). Seven (21.1 percent) received a grade of DSP and all of these had a

Table 20

Grades Earned by Developmental Students in Developmental Math 0980/0100 or 0990/0110 and Their ASSET Test Algebra Portion Scores

Fall 1989 Semester

		Grade in Developmental Math						
		A	B	C	DSP	F	W	I
		Frequencies						
ASSET	1-4	0	0	0	8	0	0	0
Test	5-8	5	4	1	23	3	0	2
Ranges	9-12	3	4	2	21	0	0	2
	13-16	1	1	0	1	0	0	0

N = 73

Table 21

Grades Earned by the non-Developmental Students in College Algebra (Math 1110) and Their ASSET Test Algebra Portion Scores

Fall 1989 Semester

		Grades in College Algebra (Math 1110)						
		A	B	C	D	F	W	I
		Frequencies						
ASSET	1-4	0	0	1	1	0	0	0
Test	5-8	2	4	1	1	1	0	0
Ranges	9-12	2	5	6	3	3	2	1
	13-16	0	5	14	4	0	1	2
	12-20	4	6	0	0	2	0	0
	21-24	1	1	0	0	0	0	0

N = 71

Table 22

Grades Earned by Developmental Students in Developmental English 0980 (Writing) and Their ASSET Test Language Usage Scores

		Grades in English 0980 (Writing)						
		A	B	C	DSP	F	W	I
		Frequencies						
ASSET	20-26	0	2	0	0	0	0	0
Test	27-33	1	2	1	0	0	0	1
Ranges	34-40	1	3	6	4	2	0	0
	41-47	0	2	2	3	2	0	0
	48-54	0	0	1	0	0	0	0

N = 33

language usage score of 41 or higher. All students in English 0990 persisted to the end of the semester.

Table 23 displays the grades earned by developmental students in developmental English 0880 (reading) and their ASSET test language usage portion scores. Three (75 percent) of those with a language usage score of 33 or lower were successful in English 0880. All 14 of those with a language usage score of 41 or higher were successful in English 0880. Scores for this group on this test ranged from a low of 20 to a high of 53. The overall success rate was 90.3 percent (28 out of 31). All students in English 0880 persisted to the end of the semester.

Table 24 shows the grades earned by the non-developmental students in freshmen English 1010 and their ASSET test language usage portion scores. Eighty-one (92 percent) of those with a language usage score of 41 or higher were successful in English 1010. There were no students in this group with a score less than 34 on this test. This indicates that the language usage ASSET score was a good predictor of success in college English.

Table 25 exhibits the grades earned by the developmental students in developmental English 0980 (Writing) and their writing sample scores. There were 30 in this group, of which a total of 18 (60 percent) were successful. No one in this group had sample writing score above 3.
Table 26 presents the grades earned by the non-developmental group in English 1010 and their writing sample scores. There were 89 who had writing sample scores. The overall success rate for this group was 83.1 percent. The largest number of students (55) had a writing sample of 3 and of these 50 (90.1 percent) were successful.

Table 23

Grades Earned by Developmental Students in

English 0880 and Their ASSET Language Usage Portion Scores

		Grades in English 0880 (Reading)						
		A	B	C	DSP	F	W	I
		Frequencies						
ASSET	20-26	0	1	1	0	0	0	0
Test	27-33	0	2	0	0	1	0	0
Ranges	34-40	2	2	7	2	0	0	0
	41-47	0	3	8	0	0	0	0
	48-54	0	2	1	0	0	0	0

N = 31

Table 24

Grades Earned by non-Developmental Students in English 1010 and Their ASSET Language Usage Portion Scores

		Grades in English 1010						
		A	B	C	D	F	W	I
		Frequencies						
ASSET	20-26	0	0	0	0	0	0	0
Test	27-33	0	0	0	0	0	0	0
Ranges	34-40	0	0	0	1	0	0	0
	41-47	0	3	11	3	0	0	1
	48-54	9	16	9	4	2	2	2
	55-61	11	10	4	1	0	0	0

N = 90

Table 25

Grades Earned by the Developmental Students

in English 0980 (Writing) and Their Writing Sample Scores

Fall 1989 Semester

		Grades in English 0980 (Writing)						
		A	B	C	DSP	F	W	I
		Frequencies						
Writing	1	0	0	1	1	0	0	1
Sample	2	1	6	6	5	3	0	0
Scores	3	1	2	3	1	1	0	0
	4	0	0	0	0	0	0	0
	5	0	0	0	0	0	0	0

N = 32

Table 26

Grades Earned by the non-Developmental Students in English 1010 and Their Writing Sample Scores Fall 1989 Semester

		Grades in English 1010						
		A	B	C	D	F	W	I
		Frequencies						
Writing Sample Scores	1	0	0	1	0	0	0	0
	2	0	1	3	2	0	1	1
	3	10	20	14	6	2	1	2
	4	9	8	2	1	0	0	0
	5	0	0	0	0	0	0	0

N = 84

Table 27 displays the ACT math scores for the developmental students and their grades earned in Math 0980/0100 or 0990/0110 during the fall 1989 semester. Eleven (20 percent) of those with a ACT math score of 12 or less were successful in Math 0980/0100 or 0990/0110. One (33.3 percent) of those with a ACT math score 17 or higher were successful. Fifty (70.4 percent) of the group receive a DSP grade. The overall success rate was 27.4 percent (20 out of 73). All students in this group persisted to the end of the semester.

Table 28 shows the ACT math scores for the non-developmental students and their grades earned in college algebra (Math 1110). Eleven (64.7 percent) of those with a ACT math score of 12 or less made a satisfactory grade in college algebra. Thirty-one (75.6 percent) of those with a ACT math score of 17 or higher were successful in college algebra. The overall success rate for this group was 67.1 percent (41 out of 73). Eleven with good ACT math scores (above 17) made unsatisfactory grades in college algebra. Five (6.8 percent) of this group withdrew before the end of the semester. The ACT math score was not as good an indicator of success in mathematics as was the ASSET numerical scores.

Table 29 exhibits the ACT English scores and the grades earned in English 1010 for the developmental group. No one in this group earned an "A" grade in English 1010. Twenty-one (84 percent) of those with 9 or above ACT English scores were successful. Ten (71.4 percent) of those with 13 or above were successful. As was pointed out earlier in this chapter there were a number of students enrolled that had no ACT scores. This particular group had 35 students. Also a total of 36 additional students had an ACT English score but had not attempted English 1010.

Table 27

ACT Math Scores for the Developmental Students and Their Grades Earned in Developmental Math 0980/01110 or 0990/0110 Fall 1989 Semester

		Grades in Dev. Math 0980/0100 or 0990/0110						
		A	B	C	DSP	F	W	I
		Frequencies						
ACT	1-4	1	2	0	10	0	0	0
Math	5-8	3	4	0	16	1	0	1
Ranges	9-12	1	1	1	15	0	0	1
	13-16	3	3	0	7	0	0	0
	17-20	1	0	0	1	0	0	0
	21-24	0	0	0	1	0	0	0

N = 73

Table 28

ACT Math Scores for the non-Developmental Students and Their Grades Earned in College Algebra (Math 1110) Fall 1989 Semester

		Grades in College Algebra (Math 1110)						
		A	B	C	D	F	W	I
		Frequencies						
ACT	1-4	0	1	0	0	0	0	0
Math	5-8	1	1	4	0	0	1	0
Ranges	9-12	0	2	2	3	2	1	0
	13-16	2	3	3	3	2	2	0
	17-20	1	7	6	3	1	1	2
	21-24	2	4	5	1	0	0	1
	25-28	2	1	1	1	0	0	0

N = 72

Table 29

ACT English Scores for the Developmental Students and Their Grades Earned in English 1010 Through Spring 1990 Semester

		Grades in English 1010						
		A	B	C	D	F	W	I
		Frequencies						
ACT	1-4	0	1	1	6	2	0	0
English	5-8	0	2	1	3	2	0	0
Ranges	9-12	0	3	4	4	0	0	0
	13-16	0	1	3	2	2	0	0
	17-20	0	0	3	0	1	0	0
	21-24	0	0	1	0	1	0	0

N = 43

Nineteen of these dropped out of college before attempting English 1010 and 17 were still enrolled in the spring 1991 semester but had not attempted English 1010.

Table 30 gives the ACT English scores and the grades earned in English 1010 for the non-developmental group. There were 83 in this group, of which 72 (86.7 percent) were successful. Three students had an English 1010 grade but did not have an ACT English score. Twenty-seven of these students had withdrawn from college by the spring 1991 semester. All 3 students who received a F grade in English 1010 had an ACT English score of 17 or above. An ACT English score of 13 or above indicated a high degree of success in English 1010.

At the end of the fall 1989 semester the developmental students (Groups IA and IB) had attempted 1153 college-level hours for an average of 10.9 compared with 1655.5 college-levels hours with an 15.9 average for the non-developmental (Group II) group. The developmental group had completed 1000 hours of college-level work for an average of 9.43 as compared with 1418 college-level hours with a 13.6 average for the non-developmental group. The GPA for the developmental group was 2.09 as compared with 2.44 for the non-developmental group.

At the end of the spring 1990 semester Group IA had attempted 868 college-level hours for an average of 22.5, Group IB had attempted 1397 college-level hours for an average of 27.4, and Group II had attempted 2969 college-level hours for an average of 34.1. Group IA had completed 794.5 hours for an average of 23.4, Group IB had completed 1141.5 hours for an average of 22.4, and Group II had completed 2626.5 for an average of 30.0. The GPA for Group IA was 2.26, for Group IB 2.09, and for Group

Table 30

ACT English Scores for the non-Developmental Students and Their Grades Earned in English 1010 Through Spring 1990 Semester

		Grades in English 1010						
		A	B	C	D	F	W	I
		Frequencies						
ACT English Ranges	1-4	0	0	0	0	0	0	0
	5-8	0	0	0	1	0	0	0
	9-12	0	0	2	0	0	0	1
	13-16	2	1	5	1	0	0	0
	17-20	4	10	8	4	1	0	1
	21-24	8	16	5	2	1	1	2
	15-28	3	0	1	0	1	0	0

N = 83

II 2.85. The mean hours completed and GPA for Group IB was the lowest for the three groups at the end of spring 1990 semester.

At the end of the spring 1991 semester Group IA had attempted 1319 college-level hours for an average of 59.9, Group IB had attempted 1485 college-level hours for an average of 55, and Group II had attempted 3680.6 hours for an average of 63.5. Group IA had completed 1261 hours for an average of 57.3, Group IB had completed 1328.5 hours for an average of 49.2, and Group II had completed 3596.5 hours for an average of 62.0. The GPA for Group IA at the end of spring 1991 semester was 2.35, for Group IB 2.29, and for Group II 2.84. Group IB had the lowest average completed hours and the lowest GPA of the three groups.

Table 31 shows the high school GPA of the three groups and their college GPA through 1991. The greatest difference was in Group IA.

It was noted note that 76 (71.7 percent) of the 106 developmental students (Groups IA and IB) passed all their non-developmental courses for the fall 1989 semester. This compares favorable with 80 (76.9 percent) of the 104 non-developmental students who passed all their courses the first semester. The results at the end of the second semester (spring 1990) were 42 (48.8 percent) of the 86 returning developmental students passed all their courses and 66 (75 percent) of the 88 returning non-developmental students passed all their courses. Forty (37.7 percent) of the developmental students and 63 (60.5 percent) of the non-developmental students passed all their courses for fall 1989 and spring 1990 semesters. At the end of the spring 1991 semester 20 (18.8 percent) of the developmental group and 37 (35.6 percent) of the non-developmental group had passed all their courses.

Table 31

The High School GPA and the College GPA

for the Three Groups at the end of the Spring 1991 Semester

	High School GPA	College GPA
Group IA	2.51	2.30
(N = 19)	sd 0.522	sd 0.453
Group IB	2.57	2.31
(N = 26)	sd 0.461	sd 0.669
Group II	2.99	2.84
(N = 56)	sd 0.533	sd 0.567

Retention and Graduation Rates of the Groups

In this section the retention and graduation rates of the three groups will be summarized. Table 32 summarizes the retention rates for each group for the spring 1990, fall 1990, and spring 1991 semesters. The non-developmental retention rate was 15 percent greater than the developmental. Only 5 (22.7 percent) of the 22 in Group IA graduated at the end of spring 1991 semester, but there were 11 others with a 2.00 or above with less than one semester (15 hours) of course work to be completed. In Group IB three (11.2 percent) graduated with an additional 12 who could graduate in one additional semester. Group II had 30 (52.6 percent) to graduate and 18 had less than one semester to be completed before graduation.

Twenty-two (64.7 percent) of the 34 (spring 1990) students in Group IA persisted through the spring semester 1991. Similarly Group IB has 27 (52.9 percent) of 51 (spring 1990) students to persist through the spring semester 1991. Fifty-eight (66.7 percent) of the 87 students in Group II persisted through the spring semester 1991. Group IA persistence rate was approximately the same as Group II. Group IB's persistence and graduation rates were the lowest of the three groups.

At the end of the spring 1991 semester 7 of Group IA had earned no credit in college mathematics. Four of the 7 had earned an F or had withdrawn from college level math, and 3 had attempted no college level math. Four of the 7 had earned a passing grade in developmental math and 3 were not enrolled in developmental math. This was 6.6 percent of the developmental student population.

Table 32

The Retention of the Three Groups for the Spring 1990, the Fall 1990, and the Spring 1991 Semesters

		Spring 1990	Fall 1990	Spring 1991
Developmental (N = 106)	IA	34 (32%)	IA 25 (24%)	IA 22 (21%)
	IB	51 (48%)	IB 32 (30%)	IB 27 (26%)
Non-Developmental (N = 104)	II	88 (85%)	67 (64%)	58 (56%)

In Group IB, 17 had earned no college-level mathematics credits at the end of the spring 1991 semester. Eleven of these had not attempted a college-level math course and 6 had received a F or withdrew from math. Twelve of these had earned a passing grades in developmental math and 5 had failed developmental math. This was 16 percent of the developmental student population or almost one in six. For the developmental students (Group IA, IB), 24 (22.6 percent) had no college-level math credit at the end of spring 1991 semester.

In Group II (non-developmental group) 7 had not attempted a college-level math course and 3 others had received F's or W's. This was 17.2 percent of those who persisted through the spring semester 1991 or 9.6 percent of the total non-developmental student population. This was approximately one in ten.

Results of the Student Questionnaire

There were 20 students who responded to the questionnaire. Of these, 17 were Caucasian, 1 was American Indian, and 2 were Black. This compares favorable with the original population. One of these had not finished high school. Sixteen had taken developmental math, 6 had developmental reading, and 6 had writing. Four had taken Math 0980 and 0990. Fourteen responded that they were placed in developmental courses based on freshmen week testing, one responded that his had been a condition of admissions and one responded that his admission was based on his advisor's recommendation. Four were in developmental courses based on their own choices.

Fifteen indicated that they were fully aware why they were place in developmental courses with 5 indicating they did not fully understand why they were placed in developmental courses.

Seventeen (85 percent) used the student support services with thirteen using the service one or more times per week. All who used the student support service found it helpful. Six of these indicated that it was very helpful. Ten (62.5 percent) felt that a required math lab period would be helpful while 6 did not think so. For reading only one of the 6 felt that a required lab would be beneficial and in writing only two felt that a required lab would be helpful.

The two items (question 9) that were used by the instructor which students found to be most helpful in the math classes were the textbook and tests as indicated by the following table (Table 33). The mean rating for textbook was 3.8 and 3.5 for tests on a scale of one to five. Only 6 responses were received for reading and writing courses. No calculations were performed to show significance.

Table 34 gives the students' rating of the difficulty of the courses content (question 10). Students' responses indicate that content of the developmental courses was easy to very easy. No one rated the content in any of the developmental courses as difficult. The mean scores of the math was 3.9, reading 4.3, and writing 4.2.

Questions 11 and 12 were designed to gain information about the students' perception of the helpfulness of the developmental courses in helping them to achieve their educational goals. The mean for question 11 was 3.45 and for question 12 the mean was 3.2. Student responses indicated that the courses were helpful.

Table 33

Students Rating of the Material Used in

Developmental Math

	Not used	Not helpful				Very helpful
	0	1	2	3	4	5
		Frequencies				
Textbooks	0	1	0	5	5	5
Computer Software	12	2	1	0	1	0
Video tapes	13	0	1	0	0	2
Audio tapes	14	1	0	0	0	1
Overhead	14	0	0	0	1	1
Testing	0	1	1	3	6	4
Other (tutors)		0	0	0	1	3

Table 34

Students' Rating of the Difficulty of the Content of the Developmental Courses

	Difficult 1	2	3	4	Very easy 5
	Frequencies				
Developmental Math	0	4	1	3	8
Developmental Read	0	0	1	2	3
Developmental Writing	0	0	2	1	3

Questions 14 and 15 obtained responses on students' attitude toward developmental courses before taking a developmental course and after taking a developmental course. As measured by the means there was an improvement in the attitude of the students toward developmental courses after taking a developmental course. The mean before was 2.6 and after taking a developmental course the mean was 3.45.

Eleven of the 16 developmental math students would recommend the course to a friend (Question 16) and 4 of the 6 developmental reading students' would recommend the course to a friend, while only 3 of the 6 developmental writing students would recommend the course to a friend.

Question 17 gives the students' rating of the instructor attitude toward the course in the course (s) that they had taken. The mean rating for the mathematics instructor was 4.2, for the developmental reading instructor 3.3, and for the developmental writing instructor 4.2. The overall rating of the instructors in developmental courses was good.

In question 18 the students were asked to rate the method of instruction in each developmental class that they had taken on a scale of 1 to 5, used 1 for no help and 5 for very helpful. The mean for developmental math was 3.6, for the developmental reading 3.0, and for the developmental writing 3.7. Again the overall rating of the method of instruction was good. Students tended to rate the reading course lowest.

In question 19 students were asked to rate on a scale of 1 to 5 the helpfulness of items. Instructional time was given a rating of 3.2, tutorial time had a rating 2.9, individual study time was given a rating of 4.0, and test/quiz time a rating of 3.4. All items received a positive rating (greater than 2.5). This was true for developmental math, developmental reading,

and developmental writing. Three students stated the lab time was helpful. The overall lab rating was a 2.5.

Ten responded to question 20 by saying that they planned to earn a B.S. degree and 9 responded that they planned to earn an A.A. degree. Twelve planned to complete the A.A. degree in 4 semesters, while 4 felt it would take 5 semesters. This would indicate that many of the developmental students may have unrealistic goals of the time required for degree completion.

Summary

It is clear that Hiwassee College did a good job in identification of developmental students. Students were successful in the area of English where the developmental reading and writing provided preparation for college English. However, the developmental mathematics program was not adequate preparation for college algebra for many of the students.

It was noted that the grade of DSP given in developmental studies was intended to indicate that the student was making "progress" but had not completed sufficient material to receive credit for the course. However, this grade was equated as a D grade by the administration of the college to permit students to meet eligibility requirements for financial aid and athletics.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to investigate the nature and characteristics of the developmental program at Hiwassee College. In addition it ascertained the success rate of the developmental students at Hiwassee College compared with the success rate of the non-developmental students in terms of hours attempted, hours completed, GPA, and graduation rates. Information relative to these areas of investigation was obtained from four main sources: college catalogues and class schedules, the college data base, students' academic files, and a student questionnaire. The fall 1989 freshmen class was used as the population for this study, with this population being tracked through the spring 1991 semester. This freshman class consisted of two main groups--a developmental group and a non-developmental group. After the fall 1989 semester the developmental group formed two subgroups--Group IA made up of those students who completed their developmental requirement the fall 1989 semester and enrolled in college-level classes during the spring 1990 semester. Group IB were comprised of those students who continued their developmental studies the spring 1990 semester. From the freshmen fall 1989 class, only those students who were classified as full-time were part of this study. Full-time meant that a student was enrolled for 12-credit hours or the equivalent.

The total population consisted of 210 students--106 classified as developmental and 104 as non-developmental. A developmental student was one who had enrolled in at least one of the developmental courses. Eighty-five of the developmental group returned in the spring 1990 semester. These formed Group IA containing thirty-four students and Group IB consisting of fifty-one students.

It was hoped that the results of this study would be useful to Hiwassee College in assessing its developmental programs. It is imperative that the developmental program be revised, evaluated, and changes made as needs warrant. Approximately 50 percent of the freshmen student population at Hiwassee College was enrolled in one or more developmental course.

This chapter presents a summary of the findings of the study, conclusions, recommendations, and suggestions for further study. The findings of this study consisted of the history of the developmental program at Hiwassee College, the characteristics of the developmental students, the results of the freshmen week testing, the performance of the developmental students, comparison of the success of the three groups in this study, the attrition and graduation rates of the groups, and the analysis of information obtained from the student questionnaire.

Summary of Findings

The Developmental Program at Hiwassee College

According to school catalogues, the developmental program at Hiwassee College has been in existence since the 1969-70 academic year. It

has undergone many changes over the past twenty years. According to the colleges' catalogues the program have changed in structure and organization but not in its central purpose. A conscientious effort has been made to make the program responsive to the needs of the students. This was particularly true during the past five years with emphasis upon sound placement procedures that included the use of the high school transcripts, the ACT scores, ASSET testing, and an in-house writing sample.

The Characteristics of the Developmental and non-Developmental Student

The developmental student at Hiwassee was only slightly more likely to be female (54.7 percent) when compared with the total student population which was 53.3 percent female. Where as the total Black population was 12.4 percent, the developmental Black population was 20.7 percent. The developmental student was more likely not to have taken the ACT or SAT, 18.9 percent as compared with 9.6 percent for the non-developmental. The composite ACT score for the developmental group was 12.5 compared with 18.2 for the non-developmental group. There was a greater difference in the math ACT scores where the developmental group has a mean of 8.6 and the non-developmental had a mean of 15.2. The high school GPA of the developmental group was 2.449 as compared with a GPA of 3.002 for the non-developmental. Twenty-three (21.7 percent) of the developmental group had no high school GPA listed and the non-developmental group had only 15 (14.4 percent). These incomplete records and scores may indicate that these students decided upon college at the "last minute".

Results of Freshmen Testing

The choice of majors by the developmental and non-developmental students was essentially the same (Table 11). Developmental students choice of majors indicated they were as diversified in their career goals as non-developmental students. This might indicate that many developmental students were unrealistic in their career choices, particularly in the pre-professional areas such as pre-med.

There are major differences in the scores on the ASSET tests for the two groups. There were significant differences in the language usage section score of the ASSET where the mean of the developmental group was 43.0 and for the non-developmental group the mean was 50.9. This difference was acute in the scores on the numerical part where the mean of the developmental group was 16.3 and the mean of the non-developmental group was 22.6. Similar difference occurred in the algebra test scores where the mean of the developmental group was 7.8 as compared with a mean of 12.4 for the non-developmental group. There was also a marked difference in the writing sample scores, with a mean of 2.7 for the developmental group compared with 3.1 for the non-developmental group.

Performance of the Developmental Students

Table 12 (p. 81) clearly indicates that the developmental students did not perform satisfactorily in developmental math classes. Sixty (69.8 percent, N = 86) of the developmental students in Math 0980/0100 received a DSP while an additional 8 (9.3 percent) received an unsatisfactory grade (F, I, or W). Only 8 (20.9 percent) received a C or better grade. The

success rate was much better in both reading and writing. In developmental reading 27 students (87 percent) and in writing 21 students (59.5 percent) achieved a C or better grade.

Those who continued their developmental studies (Developmental Math 0990/0110), having earned a DSP in the previous course, continued to perform poorly where 15 (31.3 percent) made F's and another 11 (22.9 percent) received a DSP. Only 18 (37.5 percent) received a C or better in Math 0990/01110.

For those 16 who were successful in Math 0980/0100 10 (62.5 percent) were successful in college algebra, i.e. received a grade of D or better. There were 4 students who earned a DSP in Math 0980/0100 who received a passing grade in college algebra. Table 15 shows that 8 of those who were successful in Math 0990/0110 were also successful in college algebra. The success rate in college algebra was good for those developmental students who were successful in developmental math.

Table 16 shows that 20 of the 25 who were successful in developmental reading were also successful in freshmen English and all twenty of those who were successful in developmental writing were successful in freshmen English. Those who were unsuccessful in developmental writing were also unsuccessful in freshmen English.

Comparison of the Three Groups

Table 18 shows that the overall success rate in college algebra for the developmental group was 22.6 percent. Thus the likelihood of a developmental student being successful in developmental mathematics and then earning a passing grade in college algebra was about one in four.

The success rate in freshmen English was approximately 75 percent for those who completed the developmental writing and/or the developmental reading.

Table 19 gives the success rate in college algebra for the non-developmental students. The success rate was 80.3 percent for those who attempted college algebra. The success rate for this group in freshmen English was 92 percent.

Attrition of the Three Groups

The overall attrition rate for the developmental students was 53.8 percent. The dropout or withdrawal rate for the developmental group for the first semester was 19.8 percent. The withdrawal rate at the end of the second semester (spring 1990) was 22 percent. The attrition rate for Group IA was 32.4 percent, while the attrition rate for Group IB was 47.1 percent. The attrition rate for Group II was the second lowest of the three groups at 34.1 percent. The attrition rate for Group IB was the highest of the groups. This might be expected since these students attempted to remove a mathematics deficiency over a two semester period. These students had not performed well in Math 0980/0100 earning DSP's and F's. The performance of these students in Math 0990/0110, where only 8 earned a passing grade, was poor.

Hiwassee College retained 46.2 percent of its developmental students. The retention rate for the developmental group was less than that researchers have reported in earlier studies. For example, Budig (1986) reported that the retention rate for developmental students at the end of two years was 59.7 percent.

The retention rate for the non-developmental group (Group II) was 55.8 percent. The difference in the retention rates for the developmental and non-developmental students was approximately 10 percent.

Results of the Questionnaire

The results of the questionnaire revealed that generally the developmental students were satisfied with the structure, content, and instructional methods of the developmental courses. There was also an improvement in the attitude of the developmental student toward developmental courses where the rating before taking a developmental course(s) was 2.70 and after taking a developmental course(s) the rating was 3.45 on a five point scale.

Conclusions

The major conclusions were:

1) Hiwassee College was doing good job in identification of the developmental students through an intensive testing and advising program.

2) The best indicators for success in a developmental course were the results of the ASSET tests and ACT scores. The numerical section of the ASSET test was a good indicator of the success in developmental mathematics as well as college algebra. A score of 15 or above would be a good indicator of success in college algebra. The language usage portion of the ASSET test was a good indicator of the success in developmental reading and/or writing, perhaps somewhat better for developmental writing. A score of 34 or above would be a good indicator for success in freshmen

English. A score of 13 or above on the ACT in English or math would be good cut off score for the non-developmental students.

3) Many of Hiwassee's students were successful in completing developmental mathematics but did not enroll in college-level mathematics or had an unsatisfactory experience in college algebra.

4) Many of the non-developmental group did not complete a college-level mathematics course. This was evident in that approximately 25 percent of Hiwassee' students had failed to earn a satisfactory grade in college algebra at the end of two years.

5) Hiwassee's developmental mathematics program did not adequately prepare students for college-level mathematics. Many students avoided college level mathematics.

6) The persistence rate for the developmental students was 46.2 percent while the persistence rate for the non-developmental student was 55.8 percent. This was probably good considering the background of the students where the composite ACT was 15.6 (N = 180).

7) Hiwassee enjoyed a strong administrative support for the developmental program as was evidenced by the quality of the staff, the location of the facilities, and materials available to the students. This was also evident in the mission statement of the College where a strong commitment was made to meet the needs of all its students. The history of the developmental program revealed an affirmative support for the program.

Recommendations

The following recommendations are made.

1) Greater effort needs to be given to the planning and implementation of a developmental mathematics program that will ensure a higher success rate in future mathematics courses. This planning should include timetables (schedules) and sequencing of courses.

2) There is a need for more resources and more time put in to tracking students to determine why students drop out and why students are not successful in developmental courses, particularly in mathematics.

3) The developmental curricula should be more closely coordinated with the academic divisions.

4) Students enrolled in developmental courses should remain in developmental courses until a satisfactory grade is earned. That is, students should not be permitted to enroll in a college-level course until they have removed developmental deficiencies. For example, students should satisfactorily complete developmental mathematics requirements before being allowed to enroll in college algebra.

5) There should be instituted an exit exam for each developmental course. This is particularly true for mathematics. This should be done in conjunction with an entrance exam for the next course in the sequence.

6) There should be a follow-up of the developmental students to determine their success in other college courses. That is, determine if a relationship exists between the ASSET reading and language usage scores and other reading courses such as psychology and history.

7) A developmental studies guide should be developed. This guide should obtain information on the program as to goals and objectives, courses and content, and philosophy of the program. This should be given to college teaching faculty. Copies should be placed in the school library and advising center. Students should be provided a copy upon admission.

8) Developmental mathematics instructors should make use of a wider variety of instructional materials and techniques. All developmental mathematics classes should have a required laboratory period. This laboratory period could and should be spent in a variety of ways, from individual tutoring to small group teacher directed discussion of students progress and problems.

9) Hiwassee College should continue to use the ASSET tests for placement in developmental course.

10) The grade DSP should be dropped from the grading scale and a less confusing one selected. Perhaps a grade of "R", which would indicate that the developmental student must "Repeat" the same course before moving to the next level. This would also eliminate the use of the DSP grade by the administration as a passing grade.

Suggestions for Further Studies

As a result of this study the following items are suggested for further study.

1) The fall 1990 freshmen class should be tracked through the spring 1992. This would give an enhanced profile of the developmental student

at Hiwassee College with a larger group and with different freshmen classes.

2) There should be a follow-up study of this group (fall 1989 freshmen) to determine the graduation rate at the end of the summer 1991 semester and perhaps at the end of the fall 1991 semester.

3) A questionnaire similar to the one used in this study should be constructed to measure items at the beginning and at the end of the developmental students' experiences in developmental courses. This would give another measure of the effectiveness of the developmental program.

4) There should be a study of the time-lapse between the last high school mathematics course and the first college mathematics course. There may be a significant retention loss between the high school courses and the college course due to time.

5) There should be a study of the developmental students who completed the developmental sequence and then delayed college level mathematics.

6) There should be a study of the developmental group from the spring 1990 semester and the fall 1991 semester to see what effect the summer had on the groups.

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APPENDICES

APPENDIX A

COVER LETTER FOR STUDENT QUESTIONNAIRE

STUDENT QUESTIONNAIRE

Cover Letter for Student Questionnaire

To: _____
Fall 1989 Developmental Student

From: Conlie Rasnake

Subject: Developmental Studies Questionnaire

Date: April 21, 1991

As part of the evaluation of the developmental studies program all students who enrolled in a developmental course during in the fall of 1989 are being asked to complete a developmental studies questionnaire. It is estimated that the completion of this questionnaire will require about 15 minutes of your time. Information gained from this questionnaire will be used in a doctoral dissertation. Also this information will be used to make recommendations for the developmental studies program. Come by the Student Support Serviced Lab (BLC) to schedule a time for the completion of this questionnaire. It is very important that everyone complete this questionnaire.

Your completion of this questionnaire is voluntary. However, it is hoped that everyone will complete the questionnaire so that maximum information can be compiled.

No individual will be identified directly or indirectly in the reporting of the information gained as only group information will be reported.

Student Questionnaire

Demographic Information

Complete the following general information. If you are unsure about any item, leave it blank. Test scores will be verified by the Admission Office. Academic records will be used to confirm grades, etc.. It should take approximately 15 minutes of your time to complete this questionnaire. Your signature on this form indicates that your participation is voluntary. Again, no names will be used in the final report. Only group information will be used.

Signature:_____

1 Name. _____

2. Sex _____ 3. Age_____ 4. Race_____

5. High School gpa _____

6. High School_____

7. Number in family._____

8. Approximate family income
___ $0--$4,999 ___ $5,000-$9,999 ___ $10,000-$14,999

___ $15,000-$19,999 ___$20,000--$29,999
___ $30,000 and more

9. ACT Scores ___English ___Math ___ Composite

10. ASSET test scores: ___LA ___RE ___NUM ___ALG

11. Writing sample score:_____

12. First Semester : _____Hours attempted
_____Hours completed
_____GPA

13. Second semester: _____Hours attempted
_____Hours completed
_____GPA

14. End of 2nd. year: _____Hours attempted
_____Hours completed
_____Cum. GPA

15. Have you completed your science requirement? __Yes __No

16. Have you completed a college-level math course?___Y ___N

STUDENT QUESTIONNAIRE

The faculty and administration of Hiwassee College are interested in continuous improvement of the college curriculum. This is particularly true of the developmental curriculum. You can assist us in that effort by answering the following questions. Your frank and honest response is needed. Please check or circle the appropriate responses.

1. Which developmental course(s) have you taken at Hiwassee College?

_____Math 0980/0100 _____ Math 0990/0110
_____Reading/Study Skills 0880 _____ Writing 0990

2. On what basis were you placed in developmental course(s)?

1. Your own choice
2. Choice based on freshmen week testing
3. Advisor's recommendation
4. Parent's suggestion
5. High school counselor's advice
6. As a condition of admission.
7. Other (be specific)_____

_____

3. Did you fully understand the reasons for your placement in developmental course(s)?

(a) _____ Yes _____No
(b) If no, what did you not understand?_____

_____

4. How satisfied were you with the procedures followed in placing you in developmental courses?

Dissatisfied satisfied Very satisfied
1 2 3 4 5

5. If you were dissatisfied with the procedures used in placing you in developmental courses, please specify why.

6. How much contact did you have with the Student Support Services staff while taking your developmental course(s) at Hiwassee College?

___None
___One or more sessions per week
___One session per Month
____Brief orientation
____More than one session per month

7. To what extent was (were) your session(s) with the Student Support Service staff helpful?

Not Helpful		Helpful		Very Helpful
1	2	3	4	5

8. For those developmental courses that you have had, would a mandatory lab have been beneficial ?

Math:___Yes ___No: Reading:___Yes ___No:
Writing:___Yes ___No

9. For each developmental course that you have had, rate the instructional material as to its helpfulness to you in learning the course content.

(a) Developmental Math._____

	Not used	Not helpful				Very helpful
Textbook/workbook	0	1	2	3	4	5
Computer Software	0	1	2	3	4	5
Video Tapes	0	1	2	3	4	5
Audio Tapes	0	1	2	3	4	5
Overhead Projector	0	1	2	3	4	5
Testing/quizzes	0	1	2	3	4	5
Other:_____		1	2	3	4	5

(b) Developmental Reading_____

	Not used	Not helpful				Very helpful
Textbook/workbook	0	1	2	3	4	5
Computer Software	0	1	2	3	4	5
Video Tapes	0	1	2	3	4	5
Audio Tapes	0	1	2	3	4	5
Overhead Projector	0	1	2	3	4	5
Testing/quizzes	0	1	2	3	4	5
Other:_____		1	2	3	4	5

(c) Developmental Writing._____

	Not used	Not helpful				Very helpful
Textbook/workbook	0	1	2	3	4	5
Computer Software	0	1	2	3	4	5
Video Tapes	0	1	2	3	4	5
Audio Tapes	0	1	2	3	4	5
Overhead Projector	0	1	2	3	4	5
Testing/quizzes	0	1	2	3	4	5
other:_____		1	2	3	4	5

10. Rate each developmental course that you have had as to the degree you were able to understand the course content.

	Difficult				Easy
Developmental Math.	1	2	3	4	5
Developmental Reading	1	2	3	4	5
Developmental Writing	1	2	3	4	5

11. To what degree do you feel that the developmental course(s) was (were) helpful to you in achieving your educational goals?

Not Helpful				Very Helpful
1	2	3	4	5

12. To what extent do you feel that the developmental course or courses that you have taken have helped you to succeed at Hiwassee College?

No Help		Some help		Very Helpful
1	2	3	4	5

13. Rate each of the developmental courses that you have had at Hiwassee as to its helpfulness in a corresponding college-level course? (i.e., How helpful was developmental writing in a college-level writing course (English 1010, developmental math on math 1110)).

	No Help				Very Helpful
Developmental Math.	1	2	3	4	5
Developmental Reading	1	2	3	4	5
Developmental Writing	1	2	3	4	5

14. How would you rate your attitude toward the courses before you enrolled in developmental course(s)?

Poor		Good		Excellent
1	2	3	4	5

15. How would you rate your attitude toward developmental courses after taking developmental courses?

Poor		Good		Excellent
1	2	3	4	5

16. Would you recommend developmental courses to a friend?

Math. _____Yes ____No
Reading ____Yes ____No
Writing ____Yes ____No

17. How would you rate the instructor's attitude toward the course?

	Poor				Excellent
Developmental Math.	1	2	3	4	5
Developmental Reading	1	2	3	4	5
Developmental Writing	1	2	3	4	5

18. How would you rate the method of instruction in each developmental course that you had.

	No Help		Helpful		Very Helpful
Developmental Math.	1	2	3	4	5
Developmental Reading	1	2	3	4	5
Developmental Writing	1	2	3	4	5

19. Rank in order each of the following on a scale of 1 to 5 as to the helpfulness to you in each developmental course that you have had. The number 5 being most helpful.

(a) Developmental math._____
_____Instructional time _____ Tutorial time
_____Individual study time _____ Test/quiz time
_____Other (specify)_____

b) Developmental Reading._____
_____Instructional time _____ Tutorial time
_____Individual study time _____ Test/quiz time
_____Other (specify)_____

c) Developmental Writing._____
_____Instructional time _____ Tutorial time
_____Individual study time _____ Test/quiz time
_____Other (specify)_____

20. Which of the following best describes your plan when you enrolled at Hiwassee College? (Check all that apply.)

_____See what college was like and then make future plans
_____Attend college for specific courses, then get a job
_____Earn a two-year degree (A.A.)
_____Get a job after the A.A. degree
_____Earn a Bachelor degree
_____Other (specify)_____

21. If you planned to earn an A.A. degree, how long did you anticipate it would take?

_____Four Semesters _____Six Semesters
_____Five Semesters _____As long as it took

22. What are your plans now with respect to your education? (Check all that apply.)

_____ Earn an A.A. degree
_____ Transfer to a 4-year school, earn a Bachelor degree
_____ Earn a degree beyond the Bachelor
_____ Get a job and return to school later
_____ Get a job but not necessarily return to school
_____ Other (specify)_____

23. Do you feel a need for other developmental courses that would help you succeed in college-level courses?

___ Yes ___No.

If yes, check those areas where a developmental course would be of benefit to you, or would have been of benefit to you.

_____ Technology courses
_____ Natural science course
_____ Social science course
_____ Other (please specify)
_____

24. As you know Hiwassee awards institutional credit for developmental courses. This credit can be used for qualification in sports, financial aid, etc.. However, it does not count toward for graduation or GPA.

(a) Should credit be given toward graduation requirement?

Math:___Yes ___No: Reading:___Yes ___No:
Writing:___Yes ___No

(b) Should the grade be calculated into the GPA?

Math:___Yes ___No: Reading:___Yes ___No:
Writing:___Yes ___No

25. Which is your preference as to a grading scale for the developmental courses?

_____ ABCDF _____Pass/Fail ___Satisfactory/
_____ ABC"DSP"F Unsatisfactory

26. How would you suggest improving the developmental course(s) that you have completed?

Math:

Writing:

Reading:

APPENDIX B

HUMAN POTENTIAL CLINIC

HUMAN POTENTIAL CLINIC
(1969-71)

The philosophy of Breakthrough--A Human Potential Clinic--is that every student is a gifted student. By diagnosis and treatment each student in the program is helped to see himself and his potential. It is designed to make any student a better student and to help him find and experience greater success today as well as in the future. He learns attitudes and skills that help him to realize his potential and to make a positive contribution to himself and society. Breakthrough's motto is " Most limits in learning are self-imposed." The courses listed below are available to any student concerned with self improvement and are non-credit except as otherwise noted. Other than for the credit course, a student will receive either a grade of P (Pass) or F (Fail).

HP I Small Group Dynamics

This class uses small group dynamics to illustrate the importance of understanding self, others, and the universe in which man finds himself. Great emphasis is placed on attitudes which liberate man from existing to living. Creative leisure is used to expose the student to varied and unique surroundings which broaden his horizon.

HP II Study Skills

A class in which good basic study habits are taught and illustrated. The student learns scientifically proven methods which will enable him to absorb the most important facts and details from books and classes and then relate them to life. This class carries one hour Orientation credit for those who have not had Orientation 101.

HP III Mathematics

The fundamentals of math are presented and extensive practice is done in these important areas. The class is developmental in nature and the student can progress at his own rate.

HP IVa Writing

This course deals with the fundamental of correct and vibrant writing. Great emphasis is placed on self and group evaluation of one's work. The students are encouraged to be creative within their own interests and to explore other areas.

HP IVb Literature

Books, plays, and poetry are chosen and studied on the basis of their contribution to good literature and their relevancy to modern day life. Class projects such as debates, discussions, role playing, and field trips contribute to a deeper understanding of literature.

HP IVc Vocabulary-Spelling Laboratory

Vocabulary and spelling are the basics to good writing and speaking. They are taught by the use of modern machines and unique teaching. Each student may progress at his own rate, but is expected to learn a minimum of 100 new words a week.

HP IVd Reading Laboratory

The reading laboratory uses modern machines and equipment to help each student learn to read faster and with greater comprehension. The goal for each student is to read 500 words pere minute with 90% comprehension.

APPENDIX C

DEVELOPMENTAL COURSE SYLLABI

DEVELOPMENTAL PROGRAM FALL 1989
Hiwassee College Catalogue 1988-89
Pp. 51,56

ENGLISH

0980-Developmental Communication Skills I

Principles and practices of effective reading and writing; reading and comprehension, skim reading, textbook reading, vocabulary building, effective study skills, reading from major writers, frequent themes and exercises in grammar and mechanics. Required session in writing and reading laboratory. Placement in class based on entrance exams. Three hours institutional credit. Normally offered fall and spring semesters.

0990-Developmental Communication Skills II

Additional work in principles and practices of effective writing and reading; required sessions in writing and reading laboratory. Three hours institutional credit only. Normally offered spring semester.

MATHEMATICS

0980-Basic Mathematics and Introduction to Algebra (Developmental)

Individualized instruction in operations on whole numbers, fractions and decimals, ratio and proportion, percent, averages, exponents, square roots, measurement, perimeter and area, introduction to algebra, absolute value, evaluating, operations on polynomials, factoring, solving linear equations, rectangular coordinate system, slopes, graphing linear equations, system of equations, inequalities, radicals, quadratic equations. Lab required. Admission by testing or departmental recommendation, or approval. Three hours institutional credit per semester. Does not meet graduation requirements. Fall, spring, summer when possible.

0990-Intermediate Algebra-(Developmental)

Individualized instruction in algebraic operations on monomials and polynomials, exponents, evaluating expressions, laws of real numbers, solving linear and quadratic equations and inequalities, systems of equations, rational exponents, powers, roots, radical expressions and equations, complex numbers, functions, graphing linear and quadratic equations and inequalities, distance an midpoint formulas, conic sections, exponential and logarithmic functions. Lab required. Admission is by testing or departmental recommendation or

approval. Three hours institutional credit. Does not meet graduation requirements. Fall, spring, summer when possible.

SYLLABI FOR DEVELOPMENTAL PROGRAM FALL 1989

Syllabus for Writing/English 0980
MWF 9:00-9:50 BLC 204Y

Fall 1089
Office: BLC 106

Purpose:

In this course you will learn the writing process and writing skills based on an understanding of structure, coherence, and mechanics. The purpose of the course is to help you develop efficient methods of writing which you can apply to your other coursework.

Required Texts and Materials:
Writing with Confidence, Third Edition, Alan Meyers
A looseleaf binder and plenty of 8 1/2 x 11 lined paper
A pocket folder
A good dictionary (Webster's Collegiate)

Class Policies:

This course is based on your acquiring writing skills. In each class one or more skills will be explained, and you will then spend most of the class period practicing the skills, writing, and peer editing. Since much of the value of this course is your own work done in class, you must attend class regularly.

Quizzes and tests will be given periodically; if you are late or miss class, you will receive a 0. Make-up work and tests will be allowed for those students with excused absences.

Four absences are permitted without question for a class that meets three times weekly. If a students misses more than four classes, the penalty is 10 points deducted from the final grade for each day absent beyond the allowed amount.

The student has the responsibility to be on time for class. If you are late for any reason, you must inform the teacher so that you will not be counted absent.

An incomplete grade is given only in cases of illness or other unavoidable circumstances, and only when the student has demonstrated the potential to pass the course. A student with a failing grade can not be given the incomplete grade. "Too heavy a load, outside activities, or extra curricular activities do not constitute sufficient grounds for an incomplete grade." (Hiwassee college catalog, 1988-89 edition, p. 14.)

Grades:

Your grade in the course is determined in the following manner:

Daily grade: 1. Journal/Notebook: 5 entries, 20 points each, equal 40% 100% There will be several sets of five collected.
2. Quizzes

Writing Assignments: 40%

Final Exam: 20%

Grading scale: A 93-100 DSP 66-74
B 84-92 DSF 0-65
C 75-83

Syllabus for Reading/English 0880
MWF 11:00-11:50 BLC 203

Fall 1089
Office: BLC 106

Purpose:

In this course you will learn the reading and study skills. The purpose of the course is to help you develop efficient methods of learning which you can apply to your other coursework.

Required Texts and Materials:
Reading and Study Skills: Form B., John Langan
A looseleaf binder and plenty of 8 1/2 x 11 lined paper
A pocket folder
A good dictionary (Webster's Collegiate)

Class Policies:

This course is based on your acquiring reading skills. In each class one or more skills will be explained, and you will then spend most of the class period practicing the skills, writing, and peer editing. Since much of the value of this course is your own work done in class, you must attend class regularly.

Quizzes and tests will be given periodically; if you are late or miss class, you will receive a 0. Make-up work and tests will be allowed for those students with excused absences.

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2. Quizzes

Writing Assignments: 40%

Final Exam: 20%

Grading scale: A 93-100 DSP 66-74
B 84-92 DSF 0-65
C 75-83

Hiwassee College Division of Science and Mathematics

Syllabus Preparatory Math 100

I Instructor:_____

II Office:_____

III Office hours posted on office door

IV Course description
This course is designed for students who meet eligibility requirements for Student Support Services and who do not meet the prerequisites for Math 1110. Course content will include a review math skills, pre-algebra and high school algebra as well as a discussion of study skills. Peer tutors will assist with classwork. Computer disks, video tapes, and audio tapes focusing on math and algebra skills are also available to all participants. Students receiving a passing grade (A, B, C, or P) will receive three hours non-transferable college credit for this course. Credits earned in Preparatory Math 100 can not be used to meet graduation requirements from Hiwassee College. Students who do not complete all the course requirements in one semester must repeat the course in order to meet the prerequisites for Math 1110.

V Textbook: Introductory Algebra, fifth edition, Keedy and Bittinger, Published by Addison Wesley.

VI Course Objectives
Preparatory math is an individualized study class designed to help the student focus on topics which will develop a better understanding of and improvement in mathematical skills.

The student will:
-Ascertain where the problem areas are in his/her mathematics education and establish a reasonable goal for material to master in one semester.
-Master the topics listed in the course outline with a 70% or better score on the unit tests and exam.
-Improve attitude toward math by experiencing success in the subject.
-Develop and demonstrate successful study skills.

VII Class requirements:

Students in this course attend class and individual tutoring sessions a total of five days per week. Attendance is required. Absences more than the number of times the class meets per week is considered excessive. The student is expected to work in class and outside of class to meet his or her goal as determined by the student and instructor. An assignment sheet containing practice assignments for each chapter will be given to the student on the first day of class. The student would bring this list to each class. All the assignments for a particular chapter must be completed before the student can take a test for that chapter. Extra practice sheets or assignments may be given depending on the student's individual needs.

When a student has completed the assignments for a chapter, he or she will take a test for that chapter and must score a &0% or higher before beginning work on the next chapter. If a student fails to make 70% or higher on a chapter test, he or she should review the chapter again or do some additional assignments on certain topics before attempting another test on that chapter.

VIII Grading Policy:

The grade for this course will be based on whether or not the students complete all ten chapters indicated on the assignment sheet and on weekly evaluations of class work and attendance. those students who complete all ten chapters will receive an A, B, or C for the course based on the following:

Chapter tests	70%	A = 90-100%
Class work and attendance	30%	B = 80-89%
Final Exam	10%	C = 70-79%

Students who do not complete ten chapters or do not pass the final exam but are showing progress will receive a grade of P and must continue the course next semester. Students who make little or no effort in this class will receive a grade of F.

IX Course Content:

1. Introduction to Algebra; Review of Arithmetic
2. Integers and rational numbers
3. Solving equations and Problems
4. Polynomials
5. Polynomials and Factoring
6. Graphs, Linear Equations and Slope
7. Inequalities and Sets
8. Fractional Expressions and Equations
9. Radical Expressions and Equations
10. Quadratic Equations

APPENDIX D

HUMAN SUBJECT APPROVAL FORM

THE UNIVERSITY OF TENNESSEE
KNOXVILLE

Research Administration
Compliances
Grants & Contracts
Proposal Development Services

CRP #: 3515 A DATE: 06/03/91

Title: Assessment of the Developmental Program at a Small Private College (Hiwassee College) in Tennessee

Rasnake, Conlie Glen
Curriculum & Instruction
Hiwassee College
Madisonville, TN 37354

Ray, Dr. John R.
Curriculum & Instruction
301 Claxton Ed. Bldg.
Campus

The project listed above has been certified exempt from review by the Committee on Research Participation and is approved.

This certification is for a period ending one year from the date of this letter. Please make timely submission of renewal or prompt notification of project termination (see item #2 below).

The responsibilities of the project director include the following:

1. Prior approval from the Coordinator of Compliances must be obtained before any changes in the project are instituted.

2. Submission of a Form 0 to request renewal, report changes during the approval period, or report termination of the project.

We wish you success in your research endeavors.

Sincerely,

Edith M. Szathmary

Edith M. Szathmary
Coordinator of Compliances

cc: Dr. J. E. Alexander
301 Claxton Ed. Bldg.

Attachment: Copy of Form A

404 Andy Holt Tower · Knoxville, Tennessee 37996-0140 / (615) 974-3466 / FAX (615) 974-2805

VITA

Conlie Glen Rasnake was born February 15, 1937 at Bee (Dickenson County), Virginia, the third in a line of fifteen children. He attended public schools in Dickenson County, completing high school at Haysi High School in 1956. He is the son of Mr. and Mrs. Tivis Rasnake.

He graduated from Hiwassee College in 1959 with an A. A. degree, from Emory and Henry College in 1961 with a B. S. degree in mathematics. He completed a M. S. degree in education from Radford College in 1964 and a M. A. degree in mathematics from the University of Illinois in 1974.

He has taught high school science and mathematics in Washington and Russell Counties in Virginia from 1961 to 1964. He has taught mathematics at Hiwassee College in Madisonville, Tennessee since the fall of 1966.

He first began his graduate studies at the University of Tennessee in the summer of 1986. He received his Doctor of Education degree with a major in Curriculum and Instruction in December 1991.

He was married on February 22, 1962 to the former Louise Arlene Wolford. He has a daughter and two sons--Karen, Darryll, and Chad and also three grandsons--David, Nicholas, and Robbie.