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**A comparison of postsecondary academic success of traditional
high school graduates and GED graduates enrolled in vocational
and technical programs at selected North Carolina community
colleges**

Shepherd, Johnny Bruce, Ed.D.

The University of North Carolina at Greensboro, 1992

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**A COMPARISON OF POSTSECONDARY ACADEMIC SUCCESS OF
TRADITIONAL HIGH SCHOOL GRADUATES AND GED
GRADUATES ENROLLED IN VOCATIONAL AND
TECHNICAL PROGRAMS AT SELECTED
NORTH CAROLINA COMMUNITY
COLLEGES**

by

Johnny Bruce Shepherd

A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

Greensboro
1992

Approved by



Dissertation Adviser

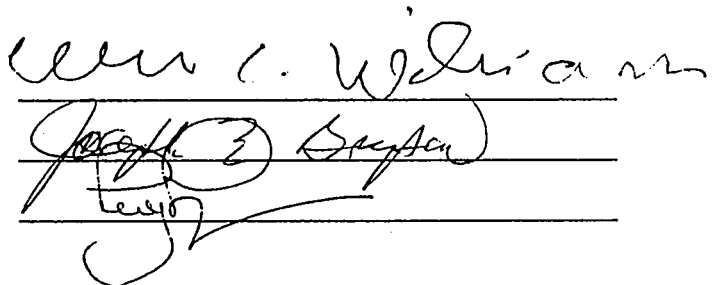
APPROVAL PAGE

This dissertation has been approved by the following
committee of the Faculty of the Graduate School at the
University of North Carolina at Greensboro.

Dissertation
Adviser



Committee Members



March 30, 1992
Date of Acceptance by Committee

March 30, 1992
Date of Final Oral Examination

DEDICATION

I wish to dedicate this dissertation to my dad - the late Grady John Shepherd, to my mother - Lillie Marie Shepherd, and to my wife - Pauline Woodruff Shepherd. My dad passed away when my doctoral coursework was completed. When that occurred my sorrow was so deep I discontinued my pursuit of the doctorate. Without the encouragement of my wife this dissertation and the degree would have been unattainable. My wish is that my degree could be shared with these three individuals who have had the most significant influence in my life.

To each of you I express my deepest appreciation and unending love. To Mother and Dad, thank you for instilling in me the desire to learn. To Pauline, thank you for loving me and for motivating me to continue even in despair. You gave me hope and encouragement when I needed it most. Thank you for guiding me to the strength which only Christ can provide.

I challenge my two children, Jonathan and Megan, to utilize the talents God has given to them as the Apostle Paul challenged young Timothy--"Study to show thyself approved unto God, a workman that needeth not to be ashamed, rightly dividing the word of truth" (II Timothy 2:15).

ACKNOWLEDGEMENTS

It is my pleasure to extend sincere thanks and gratitude to Dr. Bert Goldman, Chairman of my dissertation committee and to the committee members--Dr. Terry Ford, Dr. Joseph Bryson, and Dr. Nicholas Williamson. Each of them have had a significant influence on my attainment of the doctorate degree and I am deeply indebted to them.

A special thank you goes to Dr. Bert Goldman. Dr. Goldman was steadfast in his support of me. In my lowest moments he was there to encourage me and to prod me on to a successful completion. I thank him for the many hours he gave to make my research better and to insure that I completed each chapter on time. Without his dedication I would not have completed the dissertation.

I am grateful to the Student Services Administrators at each of the community colleges who gathered and forwarded student data to me for my research. I could not have accomplished the task without their assistance. I am also thankful to Dr. Daniel Canas at Wake Forest University who assisted me in processing the student data and to Dr. Grace Kissling at UNC-Greensboro for her statistical assistance.

My appreciation is extended to Forsyth Technical Community College. Dr. Bob Greene, President, and the

entire staff have been very supportive of my educational endeavors.

A special and sincere appreciation goes to my wife, Pauline, and to my children, Jonathan and Megan. I thank them for their patience, support, encouragement, and confidence they have shown me during my quest for the doctorate. Without them I could not have done it, and I thank them with all my love.

TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	viii
 CHAPTER	
I. INTRODUCTION	1
Purpose of the Study.	3
Definitions	4
Limitations	7
Research Questions.	8
Significance of the Study	9
II. REVIEW OF RELATED LITERATURE	13
A Historical Survey of Community Colleges	13
History of the North Carolina Community College System	16
Tests of General Educational Development.	21
College Admissions Information.	26
Studies Associated with GED Graduates and Traditional High School Graduates.	31
Summary	49
III. METHODOLOGY.	54
Subjects.	54
Instruments	57
Reliability.	62
Validity	63
Data Collection	65
Data Analysis	66
IV. ANALYSIS OF DATA	69
Description of Study Sample	69
Summary Description of Study Sample.	82
Analysis of Research Questions.	85
Other Results.	92
Summary Analysis of Research Questions	96

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS. . .	100
Summary of the Study.	100
Conclusions	104
Recommendations to the Colleges	108
Recommendations for Further Study	109
BIBLIOGRAPHY.	112
APPENDIX A. Enrollment Information	122
APPENDIX B. Correspondence with Community Colleges . .	126
APPENDIX C. Letters of Support	141

LIST OF TABLES

Table	Page
1. United States Graduating Seniors Percentile Ranks on the GED Tests	29
2. Graduating Class Ranks and GED Standard Score Equivalencies.	30
3. Community Colleges Included in the Study.	70
4. Students Included in the Study.	72
5. Community College Composition of Students by Diploma Earned	74
6. Community College Composition of Students by Sex.	76
7. Community College Composition of Students by Major.	78
8. Community College Composition of Students by Age Group.	80
9. Grade Point Averages for Students in the Study. . .	82
10. Composition of Students -- Summary of the Twelve Community Colleges' Combined Data (n = 3,429).	84
11. Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Major	88
12. Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Sex	89
13. Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Age	91
14. Summary of Postsecondary Academic Success by Sex, Age, Method by Which High School Diploma Was Earned, and Major.	95

SHEPHERD, JOHNNY BRUCE, Ed.D. A Comparison of Postsecondary Academic Success of Traditional High School Graduates and GED Graduates Enrolled in Vocational and Technical Programs at Selected North Carolina Community Colleges. (1992) Directed by Dr. Bert Goldman. 144 pp.

The purpose of this study was to compare the postsecondary academic success of students who graduated from traditional four-year high schools and GED graduates. The study focused on students enrolled at a representative sample of twelve of North Carolina's fifty-eight community colleges. The twelve colleges were selected on the basis of their enrollment and their geographic location within the state.

Data were collected on 3,429 students who were enrolled in technical and vocational programs for the first time during the 1987 Fall Quarter. The data collected on each student included major, cumulative grade point average, sex, age, and method by which they earned their high school diploma. Four research questions were developed to compare the academic success of the students. The student data were analyzed using descriptive statistics and analysis of variance. A four-way ANOVA with a .05 level of significance was utilized to determine whether there were significant differences among the grade point averages of the targeted groups of students.

Based on the analysis of the research questions it was determined that GED graduates enrolled in technical programs succeed as well as traditional high school students. However, traditional high school students succeed significantly higher

than GED graduates enrolled in vocational programs. Sex was not a significant factor in academic success. Nontraditional college age students succeed significantly higher than traditional college age students.

It was concluded that colleges should admit GED graduates to technical programs on the same basis as traditional high school graduates and should expect their academic performances to be equal.

CHAPTER I

INTRODUCTION

Sociologists and anthropologists have long held that society requires its social institutions to meet the requirements and needs of society throughout evolution. When existent social institutions either cannot or will not respond to those needs, society will create a new institution that will. The social institution we call the community college has evolved from grassroots demands of local publics." (Fountain and Tollefson, 1989, viii).

Community colleges are uniquely American institutions and have their own sense of mission. Dale Parnell states in The Neglected Majority, "They may look and act like other institutions of learning, but they have their own mission built around the general theme of providing a host of Americans opportunity with excellence in pursuing a higher education" (1985, p. 87).

From their conception, community colleges have been egalitarian in their admission policies and have sought to be educational institutions oriented toward the whole community and not to an elite few (Wilson, 1979, p. 52). Thornton (1966) addressed this in describing the flexibility of

Continuing Education curriculums. He notes that the goal of some community college administrators is "...to offer anything and everything of educational value for which there are sufficient and sustained demands" (Morris, 1943, p. 151).

Community colleges have learned that they cannot serve only the high school graduate. If they are going to be the educational institution of the whole community they must offer something for those who have dropped out of high school. Thornton (1966, p. 248) acknowledged this role stating that "an increasing number of community junior colleges are enabling adults to complete studies leading to a certificate of high school equivalency."

For a community college to offer these "complete studies" it must be committed to working with students as individuals. Ulmer (1969, p. 21) believes that such a program must start where the student is and assist him to move to where he wants to be. Frequently, this is the only chance for the student to escape from the cycle of poverty and ignorance.

Assisting high school dropouts to earn a certificate of high school equivalency (GED) may not be sufficient to meet their goal in life. They may need additional college work to prepare them for the career of their choice and many do enroll in educational programs offered at community colleges.

Purpose of the Study

The primary purpose of this study was to compare the postsecondary academic success of students who graduated from traditional four-year high school programs with students who completed studies that led to a certificate of high school equivalency (GED). The secondary purpose of the study was to provide educational policy makers with pertinent data upon which to base policy decisions, budget requests, and programs regarding the GED for the North Carolina Community College System.

The study focused on students enrolled at twelve selected North Carolina community colleges. The study compared the postsecondary academic success of students who received their high school diploma with those who received their certificate of high school equivalency (GED) and who enrolled during the 1987 fall quarter at a North Carolina community college. Comparisons were made of their academic success to determine how students who received a certificate of high school equivalency (GED) compared to students who graduated from traditional high school programs.

Definitions

1. College Transfer Program

College transfer programs are programs which offer courses that usually parallel those required during the freshmen and sophomore years of a four-year college. College transfer programs are designed to allow students to enroll in these parallel courses and to transfer to a four-year college for their bachelor's degree. Graduates of the college transfer program receive an associate degree in arts, science, or fine arts.

2. Developmental Studies Program

The Developmental Studies Program is a program that offers courses that may be credit or non-credit for students who need to improve their skills in order to perform at the level required to enroll for college transfer, technical or vocational programs. Courses in reading, writing, and mathematics are generally offered in the Developmental Studies Program. In addition, prerequisite courses and study skills courses are offered.

3. GED Graduate

A student who has completed high school by successfully passing the Tests of General Educational Development (GED) and awarded a high school equivalency certificate.

4. Grade Point Average (GPA)

All community colleges in North Carolina utilize the following quality point system: 4 quality points are awarded per credit hour for a grade of A, 3 quality points are awarded per credit hour for a grade of B, 2 quality points are awarded per credit hour for a grade of C, 1 quality point is awarded per credit hour for a grade of D, and no quality points are awarded per credit hour for grades of F or WF. The total quality points are summed and then divided by the total number of credit hours attempted to obtain the grade point average or GPA.

5. Nontraditional College Age Students

Students who were older than age 21 when they initially enrolled in a community college.

6. Postsecondary Academic Success

The academic achievement of students in courses completed at the postsecondary or college level. This academic achievement is measured by the grades students receive in courses completed. The unit of measurement for postsecondary academic success is the grade point average. Students are considered more successful if they maintain a higher grade point average.

7. Special Credit Programs

Special credit programs offer opportunities for students who want to enroll in one, two or more courses. The courses may be college transfer, technical or vocational and may or

may not be related. Although credits are earned no degrees or diplomas are awarded. Students generally take these courses for personal enrichment.

8. Technical Programs

Programs of study offered at a community college which are designed to prepare students for entry-level jobs in paraprofessional fields as technicians. With experience, many technicians can move into professional or managerial positions. Although technical programs are college-level, they are designed for entrance into employment and not for college transfer. However, some technical program credits may be accepted by four-year colleges for transfer credit into an associated technical field. Technical programs require a minimum of 96 quarter hours of credit and generally are completed in two years if taken during the day and three to four years if taken at night or on a part-time basis. Graduates receive an Associate in Applied Science degree upon graduation.

9. Tests of General Educational Development (GED)

A nationally standardized high school equivalency test composed of five subtests: Writing Skills, Social Studies, Science, Reading, and Mathematics. In North Carolina, an average standard score of at least 45 on all tests in the battery is required to pass the test and no single subtest standard score can be below 35.

10. Traditional College Age Students

Students who were age 21 or less when they initially enrolled in a community college.

11. Traditional High School Graduate

A student who has passed the necessary units of study to graduate from a public or private high school and who has received a high school diploma.

12. Vocational Programs

Programs of study offered at a community college which are designed to provide training that will enable graduates to enter a skilled occupation at the entry level and to progress rapidly to the skilled or craftsman level. Vocational programs require a minimum of 64 quarter hours of credit for graduation and generally are completed in one year if taken during the day or two years if taken at night. Diplomas are awarded to graduates.

Limitations

The primary purpose of this study was to compare the postsecondary success of students who graduated from traditional four-year high school programs with students who completed studies that lead to a certificate of high school equivalency (GED). The study focused on students who enrolled in vocational and technical programs at selected North Carolina community colleges in the 1987 fall quarter.

The study has the following limitations:

1. Socioeconomic status of the students was not considered as a variable. This data was unavailable for the large number of students selected for the study.
2. The total GED score received by a GED graduate was not considered as a variable. Only the fact that the graduate received the GED was utilized in the study since the community colleges admit students after receiving the GED and individual scores are not recorded.
3. Students enrolled for programs other than vocational and technical were not utilized in the study. Students enrolled in College Transfer, General Education, Special Credit classes, or developmental studies curriculums were not included. The rationale for this was that not all community colleges offer College Transfer or General Education curriculums and developmental studies and special credit curriculums are not degree or diploma granting curriculums.

Research Questions

1. Is there a significant difference between the postsecondary academic success of traditional high school graduates and that of GED graduates enrolled in community college vocational and technical programs?

2. Is there a significant difference by sex between the postsecondary academic success of traditional high school graduates and that of GED graduates enrolled in community college vocational and technical programs?
3. Is there a significant difference by age (traditional college age students versus nontraditional college age students) between the postsecondary academic success of traditional high school graduates and GED graduates enrolled in community college vocational and technical programs?
4. Do the interactions of such factors as age, sex, and method by which students received their high school diplomas (traditional high school graduate or GED graduate) affect postsecondary academic success?

Significance of the Study

The administration of the Department of Community Colleges coordinates the Tests of General Educational Development (GED) for the State of North Carolina. The State's GED program is the sixth largest program in the nation (1989 GED Statistical Report, pp. 26-27). In the past five years, 69,845 persons have received their GED diplomas in North Carolina (p. 27). In 1989, 21,076 persons tested for

the GED at 82 official test centers across the state (p. 23). Of those who took the GED, 13,552 or 63% passed the test and received their GED Diploma (p. 26).

Of those who attempted the GED in 1989, 12,869 or 61.3% indicated they planned to pursue further study at a postsecondary institution (p. 23). Many of those who received their GED diploma will attend a community college in North Carolina. In 1987, 20.3 percent of all high school diplomas awarded in North Carolina were GED diplomas (Carnegie Foundation, 1989, p. 38).

Although these statistics are quite impressive, very little attention has been given to determining how the GED graduates perform academically in North Carolina's community colleges. There has been minimal published research conducted in this area. Byrd, et al. (1973), Henion (1978), Ayers (1978, 1980), and McLawhorn (1981) each studied GED graduates and traditional high school graduates in selective programs at their respective community colleges. However, there has not been a statewide study conducted to determine the academic success of GED graduates enrolled in the North Carolina community college system.

This study will be the first of its kind utilizing students and community colleges in North Carolina. In an interview, Delane F. Boyer, Coordinator of Adult High School and GED Programs, North Carolina Department of Community Colleges and Chairman of the National GED Advisory Committee

stated that a study of this nature was needed in North Carolina. Information received from this study would be valuable for policy decisions and in making budget requests from the department of community colleges as well as from the state legislature regarding the GED program for the fifty-eight community colleges.

A study conducted by the Carnegie Foundation for the Advancement of Learning stated "The GED may be the lever to open the door to higher education for a growing segment of high school students. If this happens, officials of colleges and universities may want to examine whether the standard of achievement represented by the GED is sufficiently indicative of a level of performance needed for success in higher education" (Carnegie Foundation, 1989, p. 35). The Carnegie study concluded by saying "If educators have reservations about the GED as a credential indicating worthiness for further study, then it is only fair to the hundreds of thousands of GED candidates that these concerns be brought into the open and addressed. People who choose an alternative route of certification should know exactly what it represents" (p. 39).

A study comparing the academic success of GED graduates and traditional high school graduates enrolled in North Carolina community colleges would address the conclusions of the Carnegie study and would provide current research using North Carolina community colleges and students.

Quinn (1986) reported that few studies in the last decade have examined the performance of GED graduates in postsecondary education and that most of the existing studies involved very small numbers of GED graduates in postsecondary education.

CHAPTER II

REVIEW OF RELATED LITERATURE

Since the development of the Tests of General Educational Development (GED) in 1942, there has been considerable research conducted in many areas. This chapter reviews the related research in the following areas:

1. Historical survey of community colleges.
2. History of the North Carolina Community College System.
3. Tests of General Educational Development - Purpose and History.
4. College Admissions Information.
5. Studies associated with GED graduates and traditional high school graduates.

A Historical Survey of Community Colleges

Thomas Jefferson in the late 1770's formulated a plan for a system of public education so comprehensive that it would be a guiding and powerful force in the development of a true democratic society (Brubacher and Rudy, 1976, p. 148). Jefferson's dream was that the idea of excellence would be combined with that of popular enlightenment. He felt that knowledge should be available to every citizen, but that the

gifted should have ample opportunity to be trained for leadership positions. His plan contained three levels--primary schools, intermediate academics, and universities. Each of these should be supported by public funds and would be governed by the public.

Jefferson was convinced that providing education to every citizen was of highest priority for the democracy. He stated in a letter to a close friend "Were it necessary to give up either the Primaries or the University, I would rather abandon the last (university), because it is safer to have a whole people respectably enlightened, than a few in a high state of science, and the many in ignorance. This last is the most dangerous state in which a nation can be." (1976, p. 151).

It was Thomas Jefferson's plan that guided the nation in the development of educational institutions to meet the needs and desires of Americans. Altbach and Berdahl (1981, pp. 28-29) noted that the growing recognition of the value of a college education and the egalitarian sentiment for opening up opportunity for all people to move toward economic success in life stimulated the growth of public higher education. The initiative for a system of public colleges came largely after the Morrill Act of 1862 provided for the land grant colleges. The Morrill Act was significant because it emphasized increased state assistance to public higher education and it made going to college an accepted part of the American middle class tradition (1981, p. 29).

The emergence of the junior college in the late 1800's and early 1900's continued the philosophy of providing education for all people. The idea of the junior college was developed by several educators, but it was William Rainey Harper who gave it enduring appeal (Brubacher and Rudy, 1976, pp. 253-254). He felt that the junior college with an entity of its own would recruit more students who otherwise would never attend college. He also thought it would be a method for students who academically could not complete a bachelor's degree program to respectably terminate their enrollment.

The twentieth century was a tremendous growth period for junior colleges. They grew both in numbers and in enrollment of students. The development of junior colleges was affected by the growing number of colleges and the creation of these colleges geographically within reach of the mass of the people (1976, pp. 256-257). This growth of the junior college as a local or "community" college brought higher education within reach of people who otherwise would not have been able to afford to go to college. Students could enroll at the local community college for the first two years of college and then transfer to a senior college or a university to complete their bachelor's degree. However, for junior colleges to become "community colleges" for the people, the curriculum had to be expanded. In addition to offering the first two years of college, community colleges offered terminal degrees (pp. 258-259). These terminal degrees gave students training in

vocational and technical areas, preparing them for employment upon completion of specialized training.

With the expanded curriculum came the concept of "open admissions." Two-year colleges, as they were called in the 1960's, were urged by the Carnegie Commission on Higher Education to adopt an "open door" admission policy in which they would admit all high school graduates and other qualified students (p. 260). There was great apprehension in the academic community that these lowered admission standards would result in lower quality students and, in effect, a less rigorous curriculum. However, a study conducted by the Carnegie Commission on Higher Education showed that not only had quality not declined but that it had actually increased (p. 261).

History of the North Carolina Community College System

The junior college movement in North Carolina began with the establishment of Buncombe Junior College in Asheville in 1927. The college was unique in that no tuition was charged to students; it was supported solely by local taxes. This concept of public support for higher education gained national attention in a court case, Zimmerman vs. The Board of Education (of Buncombe County). Segnes (1974, pp. 2-4) emphasized the importance of this case to junior colleges. It set a precedent in terms of the legal right of a school

district to establish the thirteenth and fourteenth grades and to operate them as tax supported public education. The case was a judicial landmark for public junior colleges in that it authorized local educational systems to establish and maintain through local taxation postsecondary study. Buncombe Junior College's curriculum included vocational and technical education as well as the traditional first two years of college.

Buncombe Junior College did not have a large enrollment but its impact on the community college movement in the state and nation was tremendous. It initiated a comprehensive curriculum and promoted quality education at low tuition. Through its judicial encounters, it provided a legal basis for community colleges in North Carolina and throughout the nation (pp. 5-6).

It operated as the only public junior college in North Carolina until the late 1940's with the establishment of off campus extension centers of the University of North Carolina (pp. 6-7). Twelve centers enrolled students in the fall of 1946 for freshmen level classes to accommodate an unprecedented number of post-war students. By 1948 it appeared that the extension centers had accomplished their purpose and were discontinued. The centers in Wilmington and Charlotte were converted to junior colleges by the local boards of education. The Greensboro center chartered its own "Evening College" in 1948 but merged into Guilford College (a

four-year institution) in 1953. The Greensboro center had a significant impact upon the development of community colleges through its large curriculum offerings at night to commuting students (pp. 8-11).

The 1950's were significant in the development of community colleges in the state. The first state funds were appropriated in 1955 for the support of public junior colleges. The Board of Higher Education was established in 1955 to coordinate programs in higher education throughout the state. One of the Board's first goals was to establish tax-supported junior colleges which was accomplished in 1957 when the legislature passed the Community College Act. Unfortunately, the Community College Act provided funds only for academic programs consisting of courses at the freshman and sophomore levels in liberal arts and sciences. With no financial support for vocational, technical and adult education programs, the colleges discontinued these offerings. The Board's philosophy was that vocational, technical and adult education should not be considered as part of the State's system of higher education (pp. 13-23).

However, there were many people in the state who believed there was a tremendous need for vocational, technical and adult education. Superintendent of Public Instruction Clyde Erwin promoted a system of comprehensive community colleges throughout the state and nation. He appointed a commission to survey the need for a state supported community college system

and to project a plan for its development throughout the state. The resulting document was the Community College Study which provided a comprehensive plan for the development of such a system. Unfortunately, when it was presented to the legislature it was defeated (pp. 27-58).

With this defeat, the State Board of Education initiated a plan to develop Industrial Education Centers throughout the state. Their purpose was to provide vocational, technical and adult education at the postsecondary level. State funding was provided to establish seven centers in 1953. Their success was so tremendous that by 1962 their enrollments had grown to over 34,000 students and they had expanded to twenty centers. This was more than the combined enrollment at state supported colleges. Business and industry was supporting the centers through donating equipment and providing representatives to serve as teachers and technical advisors. The legislature provided substantial increases in state funds to operate the centers (pp. 59-76).

Through the leadership of Dallas Herring, Chairman of the State Board of Education and others, the legislature passed the Omnibus Higher Education Act of 1963. This legislative act among other things combined the state supported junior colleges and the Industrial Education Centers into the Department of Community Colleges (Wiggs, 1989, pp. 7-8). Each institution would eventually become a comprehensive community college. The current Community College Act states:

The purposes of this Chapter are to provide for the establishment, organization, and administration of a system of education institutions throughout the State offering courses of instruction in one or more of the general areas of two-year college parallel, technical, vocational, and adult education programs, to serve as a legislative charter for such institutions, and to authorize the levying of local taxes and the issuing of local bonds for the support thereof. The major purpose of each and every institution operating under the provisions of this Chapter shall be and shall continue to be the offering of vocational and technical education and training, and of basic, high school level, academic education needed in order to profit from vocational and technical education, for students who are high school graduates or who are beyond the compulsory age limit of the public school system and who have left the public schools, (1963, c.448, s.23; 1969, c. 562, s.1; 1979, c.452, s.2; 1985, c.479, s.68)--Chapter 115D, Article I, Community College Laws of North Carolina, 1963, as amended.

The community college system has experienced enormous growth since 1963. There are currently fifty-eight colleges within the system geographically located throughout the state with more than 600,000 individuals enrolled in classes each year. The philosophy of the community college system was best stated by Dallas Herring in 1964 when he stated:

The only valid philosophy for North Carolina is the philosophy of total education; a belief in the incomparable worth of all human beings, whose claims upon the state are equal before the law and equal before the bar of public opinion; whose talents (however great or however limited or however different from the traditional) the state needs and must develop to the fullest possible degree. That is why the doors to the institutions in North Carolina's system of community colleges must never be closed to anyone of suitable age who can learn what they teach. We must take the people where they are and carry them as far as they can go within the assigned function of the system. If

they cannot read, then we will simply teach to read and make them proud of their achievement. If they did not finish high school, but have a mind to do it, then we will offer them a high school education at a time and in a place convenient to them and at a price within their reach. If their talent is technical or vocational, then we will simply offer them instruction, whatever the field, however complex or however simple, that will provide them with the knowledge and the skill they can sell in the marketplaces of our state, and thereby contribute to its scientific and industrial growth. If their needs are in the great tradition of liberal education, then we will simply provide them instruction, extending through two years of standard college work, which will enable them to go on to the university or to senior college and on into life in numbers unheard of in North Carolina. If their needs are for cultural achievement, intellectual growth or civic understanding, then we will simply make available to them the wisdom of the ages and the enlightenment of our times and help them to maturity. (See Proceedings: An Orientation Conference, Community Colleges, Technical Institutes and Industrial Education Centers. Raleigh: N.C. Department of Community Colleges, June 7-8, 1964.)

This philosophy was true then and remains intact today as the foundation upon which the community college system serves the citizens of North Carolina.

Tests of General Educational Development

The purpose of the Tests of General Educational Development (GED Tests) is "to enable persons who have not graduated from high school to demonstrate the attainment of developed abilities normally acquired through completion of a high school program of study (1989 Examiner's Manual).

Passing the GED is normally considered equivalent to receiving a high school diploma.

The GED tests were developed in 1942 by the United States Armed Forces Institute (USAFI). The USAFI educational staff worked with civilian testing experts who in turn worked with an advisory committee established with the American Council on Education (ACE), the National Association of Secondary School Principals, and regional accrediting associations (1989 Examiner's Manual). The USAFI GED tests were originally given only to military personnel in order to assist World War II veterans who had not graduated from high school. Passing the GED tests would allow veterans to pursue educational, personal, and vocational goals in the same manner as though they had returned to classes and graduated from high school.

One of the test developers stated that one of the greatest assets of the GED was to provide colleges and universities with a method of equating the in-service educational experiences of the veteran and of determining his appropriate education placements when he applied for admission to college (Quinn, 1986, p. 1.). Passing the GED could be equated to completing a traditional high school curriculum and graduating. The credential could be presented to colleges, universities, and potential employers who normally required high school graduation standards (p. 1).

The GED was developed to be used nationwide. Multiple-choice questions were used throughout the test so

persons with minimal training could administer and score the tests. National norms were utilized in making the test results comparable anywhere in the nation. They were made relatively short and simple in organization so the results could be more readily understood and interpreted. A major aspect of the tests was that they were developed to measure the long term outcomes of high school--the lasting concepts, attitudes, skills, abilities, and improved judgments of sense of values acquired. It was felt by those developing the tests that scientific facts learned in the classroom and the formal pedagogical procedures of instruction were only a means to the long term outcomes (pp. 1-2).

From 1945 to 1963, the GED was administered by the Veterans Testing Service. Civilians were first permitted to take the tests in 1952. By 1959 the number of civilians had surpassed the number of veterans taking the tests (p. 2). As a result the Veterans Testing Service name was changed to the General Educational Development Testing Service (GEDTS). GEDTS operates under the American Council on Education and has administered the GED since 1963 (1989 Examiner's Manual).

An emphasis on literacy during the 1960's generated a tremendous growth in the number of civilian persons taking the GED. Federal and state funds supported adult education programs to assist adults with less than a grade school level of education. Many of these eventually were to take and pass the GED (Quinn et al, 1986, pp. 2-3).

The GED testing program although administered by GEDTS is a joint program with each state Department of Education. GEDTS under the direction and supervision of the Commission on Educational Credit and Credentials of the American Council on Education establishes guidelines for the GED. However, each state department of education may establish its own minimum test scores, minimum age of GED candidates, and any other qualifications necessary for earning a GED diploma based on the results of the tests. The state may establish guidelines that are more stringent than those established by GEDTS but they may not be less stringent (GED, Examiner's Manual, 1989).

The GED tests are administered in all fifty states, U.S. territories, ten Canadian Provinces, and several foreign countries. There are over 3400 GED Testing Centers throughout the world. In 1989, 682,728 persons were given the GED and 376,879 passed the tests. Since 1971 over seven and one-half million adults have obtained formal recognition of their educational development through passing the GED tests and receiving the GED diploma. These statistics demonstrate that the GED testing program offers adults who have not graduated from high school an opportunity for a high school diploma by passing the GED (1989 GED Statistical Report, p. 2).

A study conducted by the Carnegie Foundation for the Advancement of Teaching and published in Change Magazine (1989) reviewed some interesting statistical information about the GED. The number of persons taking the GED increased by

247.3% from 1967 to 1987. The percentage of those passing the GED has also increased from 67.4% to 74.1% during this time period. In eight states, the passing rate exceeded 90%. In 1967, 9% of all high school diplomas earned were GED recipients. By 1987 this had increased to 18.7%. The study stated "the nation is rapidly approaching the point when one of every five persons completes high school via the GED" (Carnegie Foundation, 1989, p. 37).

The average age of adults taking the GED was about 30 years old in 1967 and dropped to 26.1 in 1987. Increasingly, those who take the GED plan to pursue additional educational study. In 1967, 32% planned to continue their education. However, the percentage had risen to 49.7% by 1987 (p. 38). Henry Spille, Director of GEDTS, stated "It is difficult to pinpoint an exact reason for the trend. But a possible answer centers on the fact that the general population may be realizing that education is becoming even more critical to future employability" (Phi Delta Kappan, 1985, p. 166). Bill Kroger, public affairs director of ACE, states that "...people are beginning to realize that a high school diploma is not enough to secure a well-paying job" (pp. 166-167).

In North Carolina 61.1% of those taking the GED said they planned further educational study (1989 GED Statistical Report, p. 23). The majority of these enroll in one of the state's community colleges.

College Admissions Information

According to the American Council on Education, nearly fifty-four percent of the adults who took the GED tests in 1989 indicated that they planned to continue their education or seek advanced training. This represented approximately 356,000 persons. The Council estimated that 120,000 of these actually enrolled in college and universities which was about five percent of the entering undergraduate class.

The General Educational Development Testing Service issued a report in 1982 that was prepared to assist admission officers at colleges and universities in evaluating applicants who had passed the GED tests. The report summarized a national survey conducted of admissions officers throughout the United States. The results showed that nearly 95% of the institutions who responded admit applicants who have not graduated from an accredited high school. About 95% of these institutions admit applicants who have earned the GED or who have met specified minimum scores on the GED test. About 51% of the institutions that admit GED graduates require them to also submit additional information (such as SAT, ACT, or CLEP scores) demonstrating academic readiness to enroll in college-level coursework. In their admissions requirements about 15% of the colleges and universities require specified minimum scores on the GED tests that are higher than the scores

required to pass the tests and earn the GED diploma. (H. A. Spille, Memorandum #23, March, 1982).

The GED is intended to measure the lasting outcomes associated with a traditional high school program and not specific criteria covered in certain disciplines. As a result, students cannot provide a transcript of courses completed or class ranks. Most often students have completed only one, two, or possibly three years of a traditional high school program. Their learning has occurred during the years after withdrawing from the traditional high school program.

Many colleges and universities have requested from the American Council on Education information that ranks GED graduates in relation to other GED graduates and specifically ranks them in relation to traditional high school graduates. The Council was able to provide this since the standard scores are normalized scores based on a representative sample of graduating high school seniors across the United States who took the GED in the spring of their graduating year. The first GED standard score scale was based on a sample of graduating seniors tested in 1943. Subsequent standardization studies have been conducted in 1955, 1967, 1977, 1980 and 1987. Graduating seniors are tested each year by the Council. Standard scores are not renormed unless the scores show significant changes and warrant further investigation.

Standard scores and corresponding senior percentile ranks (Table 1) are used to report results for adults who take the GED. GED standard scores have the following properties:

1. The median average standard score for recent graduating high school seniors (1987) is fifty on each of the five GED tests.
2. The standard deviation is 10 points for these seniors.
3. The standard scores range from 20 to 80 on each test. Approximately two thirds of the graduating seniors earn scores between 40 and 60 and one percent earn scores below 30 and above 70 respectively.
4. The percent of graduating seniors at or below each GED standard score is the same for each of the five tests (American Council on Education, GED Items, pp. 4-5).

A recent survey conducted by the American Council on Education indicated that most colleges and universities accept the GED as satisfying admission requirements for high school graduation. However, some colleges require specific minimum GED scores that are higher than those required by states for graduation. Most states require an average standard score of forty-five on each of the five GED tests or a minimum total score of 225 on all GED tests.

Based on the 1987 standardization studies the American Council on Education provided percentile ranks of graduating seniors. According to the Council the percentile ranks can be

interpreted as ranks in the national graduating class of high school seniors. Table 1 shows selected scores of graduating seniors and the percentile ranks of those scores (pp. 4-5).

Table 1

United States Graduating Senior Percentile Ranks on
the GED Tests

Total GED Standard Score	Percentile Rank
340 and above	99
325	88
300	85
275	71
250	50
225	30
200	16
175	05
150 and below	01

Table 1 indicates that students who passed the GED, i.e., had a total standard score of 225 or better, actually did as well or better than thirty percent of all graduating seniors who took the test. This is significant for colleges in evaluating students for admission purposes.

Since many colleges use high school class rank for admission purposes the American Council on Education has developed information related to graduating seniors class rank and GED standard scores. Table 2 shows the most common class ranks used by colleges for admission purposes and the corresponding total standard score equivalency on the GED (pp. 4-5).

Table 2

Graduating Class Ranks and GED Standard Score Equivalencies

Rank in High School Graduating Class	GED Standard Score Equivalency
Top 5%	320
Top 10%	310
Top 20%	290
Top 25%	285
Top Third	270
Top 40%	265
Top Half	250
Top 60%	240
Top Two-Thirds	230
Top 70%	225

These ranks are beneficial for colleges in determining admission to the college or for admission to specialty programs within the college. They are also helpful in evaluating applicants for financial aid which is based on ranking of senior students in their graduating class.

Because passing the GED reflects a selection of general educational skills and does not address subject matter mastery in specific classes or disciplines, the American Council on Education recommends that colleges use local testing and/or counseling for proper placement of GED graduates in mathematics, English, or other courses that require specific subject matter mastery. If tests, i.e. Scholastic Aptitude Test (SAT) or American College Testing (ACT), are required for admission of traditional high school graduates, the Council also recommends that they be required for GED graduates (pp. 4-5).

Studies Associated with GED Graduates and Traditional High School Graduates

The development of the GED Tests in 1942 created an avenue to enter college for adults who had not graduated from high school. With the creation of the tests there were many studies conducted during the 1940's and 1950's to validate the use of the GED Tests as criterion for admission to colleges. The American Council on Education through the work of Dressel

and Schmid undertook to evaluate and summarize the research conducted to determine the effectiveness of the GED Tests for college admission.

Dressel and Schmid (1951) reviewed 89 research studies related to the GED Tests and admission to colleges. In addition, they conducted their own research concerning students who were admitted to college based on passing the GED Tests. From their review of the existing research and their own studies, they found that GED graduates could successfully manage coursework offered in a college curriculum. However, their research indicated that GED graduates were not as successful academically when compared to traditional high school graduates. They reported that GED graduates whose total GED Test score was between 225 and 275 did not perform well academically and had a much higher dropout and failure rate. GED graduates with a total score of 275 or higher performed very satisfactorily in college programs.

Roeber (1950) compared the first semester performance of 71 veterans at Kansas State Teachers College who had passed the GED Tests with the first semester performance of 397 students who had graduated from high school. He discovered that fifty percent of the GED graduates performed at "C" average or better and the distribution of their grades was very similar to the performance of the high school graduates. Although the GED graduates earned lower grade point averages than traditional high school graduates for the first semester,

the admissions committee at Kansas State Teachers College determined that the GED graduates performance was sufficient to validate the use of the GED Tests as a suitable criterion for admission to the college. Ralph W. Tyler who was one of the authors of the GED Tests in 1942 conducted two studies concerning GED graduates attending postsecondary institutions. The first study conducted in 1954 for the United States Armed Forces Institute was a fact-finding study which examined data from a large number of colleges. The study was to determine the validity of the GED Tests as a criterion for admission to college. Tyler concluded that many GED graduates were successful in college. Their academic performance was not as high as traditional high school graduates. However, the difference in academic performance for the two groups was surprisingly small. Tyler's second study (1956) was conducted for the American Council on Education to determine the success of GED graduates who were admitted to postsecondary institutions. He reviewed existing research studies as well as conducting research of his own. He found that GED graduates had the most difficulty in math and natural science and suggested that GED graduates be required to complete special preparation classes before being admitted to curriculums requiring higher skills in math and natural science.

Tyler found that GED graduates as a group succeed reasonably well academically. He stated there is sufficient

evidence from all of the available studies to justify the continued use of the GED Tests as one criterion for admission to college in lieu of the requirement of a high school diploma. He advised colleges to conduct local research to determine if other factors should be considered along with passing the GED Tests in the admission process.

Like Dressel and Schmid (1951) Tyler also investigated whether higher GED total scores would improve the academic success of GED graduates. He reviewed the grades of over 2,000 GED graduates at eleven colleges and found that fifty-four percent had grade point averages below a "C" average. He found that sixty-four percent of those with below a "C" average would not have been approved for admission to the college if a total GED score of 275 had been used rather than the minimum of 225 which is normally required to pass the GED. He further discovered that twenty-six percent of those with better than a "C" average would not have been admitted using the 275 minimum. If the 275 minimum GED total score had been used for all GED graduates for admission purposes only forty-six percent would have been admitted.

D'Amico (1957) found similar results at Indiana University for veterans admitted between 1946 and 1950 on the basis of passing the GED Tests. He found that GED graduates with GED total scores below 250 did not perform well academically while those with GED total scores above 275 were slightly above average academically. In addition, he found

that GED graduates when compared to traditional high school graduates completed bachelor's degrees at a lower percentage rate. Thirty percent of high school graduates earned degrees compared to twenty-five percent of GED graduates.

Baird (1960) studied 150 GED graduates at East Tennessee State University and found no significant differences when postsecondary academic success was compared to age, years of high school completed, or high school units in academic subjects.

Fugate (1972) found quite contradictory results to Baird's study. Fugate's research involved students at Middle Tennessee State University. He found age to be a significant predictor of postsecondary academic success. The median age of the 490 GED graduates studied was 24.1 years. He found that students above this median graduated in higher percentages and were placed on probation or suspended at a much lower percentage than those below the median age. Fugate found that women had higher academic success than men. They had higher graduation rates, fewer probation or suspension rates, and had better grade point averages than men.

Russo (1969) and Topp (1973) found very similar results in their studies. Both studied GED graduates enrolled in college in Arizona, Utah, or New Mexico. Their findings disclosed that veterans have higher academic success than non-veterans, that married students achieve better than

non-married students, and that older students perform better than younger students.

Pipho (1967) studied GED graduates who enrolled at five Colorado Colleges between 1958 and 1962. His results showed that only 19% of the 279 GED graduates graduated from college, 78% withdrew from their college, and 8% were still enrolled at the time of the study. Of those withdrawn from college, 41% had low grade point averages.

Sharon (1972) studied 1,367 GED graduates who enrolled at colleges nationwide. Of the 40 colleges which were included in the study 12 were two-year colleges and 28 were four-year colleges. He found that typical GED graduates were 28-year-old, male veterans who took the GED tests to meet college admission requirements. They had completed the tenth grade in high school, withdrew from high school because of their need to earn money, and planned to earn a bachelor's degree for a career in business. Sharon found that these GED graduates scored significantly higher on the GED tests than a national sample of traditional high school seniors who also took the GED tests. He found that the college grade point average of the GED graduate was only slightly lower than the grade point average of the traditional high school graduate. Forty-five percent of the GED graduates had grade point averages equal to or greater than traditional high school graduates. He also found that 72% of the GED graduates remained in college which he considered to be an impressive accomplishment for this

group of students. He concluded that GED graduates should be given the same consideration for admission to higher education as traditional high school graduates. He further concluded that GED graduates will earn grade point averages in college comparable to their traditional high school graduate counterparts.

Roon (1972) studied students enrolled at Metropolitan State College during a seven-year period of time. His research explained the academic achievement of students in relation to their method of admission (traditional high school graduate or GED graduate) to the college. He found that the GED graduates had the lowest grade point average of any group of students studied. Traditional high school graduates who graduated in the upper third of their high school class had the highest grade point average. He found that for students with a grade point average above 2.00 there was no significant difference between GED graduates and traditional high school graduates.

Hannah (1972) conducted research at three Alabama junior colleges. He found that there was no significant difference in grade point average between traditional high school graduates and GED graduates at the end of their first year. However, by the end of the second year of college, the GED graduates had higher grade point averages than the traditional high school graduates.

Roy (1975) studied 204 GED graduates who enrolled at Bristol Community College from 1969-1973. His results were quite different from Pipho's (1967) findings. Only 24% of the GED graduates had withdrawn from college. Of those withdrawn from college 83% had a 2.00 grade point average or better at the time of withdrawal. He identified financial problems, illnesses, and transferring to a four-year college as the main reasons why the GED graduates withdrew from college.

Murphy's (1973) research involved students enrolled in hospital-based practical nurse education programs from 1960 to 1972. She studied 40 traditional high school graduates and 46 GED graduates. She found the withdrawal rate of GED graduates was significantly lower than traditional high school graduates. She also found no significant difference in the scores of the two groups on required state licensure examinations. Since the GED graduates averaged ten years older than the traditional high school graduates, Murphy concluded that age was a major factor. This was very similar to earlier conclusions made by Fugate (1972), Russo (1969), and Topp (1973).

Moore (1973) at the University of Texas studied 220 GED graduates who enrolled at five junior colleges in the fall of 1971. For his research he selected 220 traditional high school graduates who matched the GED graduates in age, sex, and ethnicity. Moore's results were quite conclusive that traditional high school graduates experience postsecondary

academic success at greater levels than do GED graduates. He found that GED graduates were five times more likely to withdraw from college during the first semester than traditional high school graduates. Traditional high school graduates' grade point averages were higher than GED graduates. In fact, sixty-three percent of the GED graduates had grade point averages below 2.00 compared to thirty-six percent for traditional high school graduates. During the first year, GED graduates attempted, on the average, twenty-three semester hours and completed only sixteen hours. Traditional high school students attempted twenty-seven hours and completed twenty-three.

Byrd, Hayes, Hendrix, and Simpson (1973) compared GED graduates with traditional high school graduates to determine whether there was a significant difference in their performance levels. The purpose of their study was to determine whether there was a difference in reading placement test scores and in grade point averages in freshmen English or mathematics. They studied 30 GED graduates and 50 randomly selected traditional high school graduates enrolled at Wilkes Community College, North Carolina. In comparing the mean scores of both groups and testing any differences by using the t-test at the .05 level of significance they found no significant difference for either entrance reading grade level or for grade point averages in freshman English or

mathematics. GED and traditional high school graduates compared equally in the areas studied.

Rogers (1977) studied the first semester grade point averages of 170 GED graduates and 858 traditional high school graduates of Northern Kentucky University. The mean grade point average for the GED graduates was 1.71 compared with 2.11 for traditional high school graduates. Nearly 60% of GED graduates performed at or below the "D" grade level (1.99 or less grade point average) compared to 38% for the traditional high school graduates. The average age of the GED graduates was 30.11 years compared to the typical 18-year-old college freshman. The average score on the GED was 251. Rogers concluded that GED graduates can be expected to experience academic difficulties during their first semester of college regardless of their ages or GED test scores. He further concluded that GED test scores cannot be used to predict academic success and that being an older adult does not necessarily promote academic maturity.

C. V. Ayers (1978) compared the grade point averages of GED graduates to traditional high school graduates who were enrolled at Surry Community College, North Carolina, during the 1977-78 academic year. The study involved 37 GED graduates and an equal number of traditional high school graduates who were randomly selected from the student population. The mean grade point average for the GED graduates was 2.75 (based on a 4.00 system) compared with a

mean grade point average of 2.93 for the traditional high school graduates. The t-test at the .05 level of significance was used to analyze the two means. The results provided no significant difference between the grade point averages of GED graduates and traditional high school graduates. Ayers concluded that GED graduates should be encouraged to attend college and that college admissions officers should enroll GED graduates on the same basis as traditional high school graduates.

Wolf (1980) studied three groups of first-year students at South Plains College in Texas to determine the predictive value of the GED tests for two-year college success in both college transfer and technical associate degree programs. The three groups included 100 students each and represented GED graduates, traditional high school graduates, and high school non-graduates who had not attempted the GED tests. The mean first semester grade point averages for the three groups were compared. No significant differences were noted between the obtained mean grade point averages of 2.64, 2.61, and 2.60 for the three groups. Wolf concluded that the academic performance of the high school non-graduate at the two-year college degree level was not substantially different from that of the traditional high school graduate.

McLawhorn (1981) compared students enrolled at Southeastern Community College, North Carolina who had graduated from the Adult High School program. She found no

statistically significant differences in grade point averages attained, total credit hours earned, and graduation rates of the two groups. She concluded that GED graduates will perform academically as well as Adult High School graduates when enrolled in two-year college programs.

Wilson, Davis, and Davis (1981) studied the success of GED graduates and traditional high school graduates who enrolled in vocational programs at Lake City Community College, Florida in 1976-78. They studied 104 students (27 GED graduates and 77 traditional high school graduates). The average age for the GED graduates was 34.3 years and 27.9 for the traditional high school graduates. GED graduates earned a higher grade point average (2.80 based on a 4.00 scale) when compared to the traditional high school graduate (2.56). GED graduates also graduated at a higher percentage rate (63.0%) than did the traditional high graduates (59.7%). In addition, GED graduates had a higher job placement rate (63.0%) than the traditional high school graduate (56.2%). Although the GED graduates surpassed traditional high school graduates in each area studied, the differences were not statistically significant. Like Ayers (1981), Wilson, Davis, and Davis concluded that institutions offering postsecondary vocational education programs should recruit and admit GED graduates with full confidence in their ability to succeed.

Swarm (1981) conducted three studies of GED graduates to determine their ability to achieve academically in colleges

and universities. The first study looked at 184 GED graduates enrolled at all campuses of the Indiana University system. The second study focused on 109 GED graduates from Chicago State University and Northeastern Illinois University. The third study was more universal through researching 981 GED graduates enrolled at colleges and universities in Illinois, Pennsylvania, Florida, Indiana, and California.

In the first study Swarm found the typical GED graduate enrolled in college was older, between the ages of 26-35, and married with an average of 2.4 children. Forty-three percent (43%) were employed full-time and attended college only on a part-time basis. They achieved lower academically than did the average college student, but 60% obtained their bachelor's degree and received better employment positions. They experienced very positive personal feelings from their academic success which negated their prior negative feelings resulting from being high school dropouts.

Swarm's second study revealed the demographic profile of the GED graduate enrolled in college to be the same as the first study. This study focused on the needs of GED graduates while in college. A central theme that arose from the interviews and questionnaires was the need for tutorial help, especially in the beginning of their college careers. Most GED graduates indicated a need for study skills and assistance in reading and vocabulary development. Library research skills were also mentioned as a need. The students indicated

they were not as well prepared for college as their traditional high school graduate counterparts, but that academically they were equal to them. Most GED graduates stated they had to work harder than traditional high school graduates to attain the same grade point average.

Swarm concluded from the three studies that GED graduates attending colleges and universities have grade point averages equal to their traditional high school counterparts. However, they are educationally disadvantaged and need special services made available to them in several distinct areas--reading improvement (reading speed, comprehension, and retention), vocabulary development and understanding, library research skills, writing skills, and most importantly study skills. GED graduates were highly motivated and therefore were able to overcome their educational disadvantages and compete equally with traditional high school graduates. Swarm found that just meeting the minimum scores to pass the GED test was not a reliable predictor of academic success in college but that GED graduates making higher GED test scores also achieved higher grade point averages.

Cervero (1983) conducted one of the few national studies of GED graduates. He studied 13,000 GED graduates nationwide. His purpose was to describe: (1) the methods used by GED graduates to prepare for the test, (2) their performance, and (3) their educational and/or employment results 18 months after passing the GED test. He found that about 80% of the

GED graduates prepared for the GED in some way. There were significant differences regarding age, gender, highest grade completed, and race for those who prepared and those who did not prepare. He found that performance on the GED was significantly related to highest grade completed, grades received while in school, reasons for taking the GED, race, and reasons for leaving school. Over 50% stated that the GED helped them qualify for jobs. Nearly 50% were either enrolled in college or had been students within the 18 months following their passing the GED. GED graduates typically become students in two-year colleges and on-the-job training rather than attend a four-year college.

Colert (1983) did a comparison of academic success of GED graduates and traditional high school graduates who were attending Brandon University in 1982-83 for the first time. Twenty-six (26) GED graduates and 27 traditional high school graduates were studied. The mean grade point average of the traditional high school graduate (1.98 based on a 4.00 scale) was higher than the GED graduate (1.68). Colert also studied the ratio of credit hours passed to credit hours attempted. The average of these ratios was higher for traditional high school graduates (.79) than for GED graduates (.60). However, the differences in both areas were not statistically significant. The results of this study supported the finding of Ayers (1978), Sharon (1972), Swarm (1981), Wilson (1981), Wolf (1982), and others pertaining to GED graduates and

traditional high school graduates achieving the same level of academic success in postsecondary studies.

Beltzer (1985) studied 198 GED graduates and 201 traditional high school graduates who enrolled for the Fall, 1981, at Queensborough Community College in New York. His purpose was to test the Tinto Model (a conceptual model of attrition) to see whether the model was applicable in predicting freshman year persistence with a nontraditional study population in a community college setting. The Tinto Model had been very successful in predicting persistence among traditional college and university freshmen. The model states that persistence at a college is largely determined by the level of academic and social integration that students have achieved and not necessarily by the personal characteristics students bring with them when they enroll. Beltzer found that there was no statistically significant difference between GED graduates and traditional high school graduates in their rates of persistence in a community college. The first-year grade point average was the most important predictor of persistence for the GED graduate. Institutional commitment was found to be the most important predictor for the traditional high school graduate.

Quinn (1986) and Pawasarat (1986) studied extensively all GED graduates who enrolled at the thirteen universities of the University of Wisconsin from Fall, 1979 through Fall, 1984. The 2,896 GED graduates studied represented only 2% of all

students enrolled during this period. They found retention to be a major problem for GED graduates. Only 4% of those who enrolled for the Fall, 1979 had earned a degree by Spring, 1985 (a 6-year time span), 12% were still enrolled in college, and 84% had left school without graduating. One thousand, nine hundred and eighty-two of the 2,896 GED graduates withdrew from college before graduation. Of these, 35% earned no credits, 85% earned 25 credits which was equivalent to the sophomore year, but only 4% earned 54 credits or junior year status. They found that total GED test scores were not valid predictors of academic success in college since only 5% of GED graduates' first semester grades could be predicted from the students' GED test scores. At the University of Wisconsin at Milwaukee, GED graduates were compared to traditional high school graduates. GED graduates performed significantly lower than traditional high school graduates in grade point averages, credits earned, and semesters completed. The findings of this research were very different from the research conducted by Sharon (1972), Swarm (1981), Colert (1983), and others who concluded that there was no statistically significant difference in the academic success of GED graduates and traditional high school graduates.

Klein and Grise (1987) studied traditional high school graduates and GED graduates enrolled at ten of Florida's twenty-eight community colleges. The results indicated that Florida's community college student population consists of

7.5% GED graduates and 92.5% traditional high school graduates. Of the students who enroll in the Florida system 49% of the traditional high school graduates complete a degree program while only 26% of the GED graduates complete their degree programs. However, the results show that both GED graduates and traditional high school graduates require the same number of semesters to complete their college degree requirements. It takes approximately six semesters for both groups. GED graduates had a grade point average of 2.54 compared to a grade point average of 2.75 for the traditional high school graduate. Klein and Grise stated that even though the difference in grade point averages was statistically significant it was not great enough to be considered important from an academic point of view.

Banner (1989) studied 232 GED graduates enrolled at Asheville-Buncombe Technical Community College in North Carolina. Her study investigated the academic achievement of GED graduates represented by grade point average and total hours earned to determine whether the scores made on the subtests of the GED tests could be used as valid predictors of academic success in two-year college programs. The results of her study showed that the GED subtest scores proved to be a valid predictor of academic achievement as measured by overall grade point average. However, the GED subtest scores were not statistically significant predictors of academic success as measured by total hours earned. She projected that GED

graduates who have high GED total scores should expect to experience academic success when they enroll in two-year college programs.

Summary

Much research has been conducted since the GED tests were first administered in 1942 and much has been written to document the results. Dressel and Schmid (1951) summarized the first decade of research involving the GED. Their conclusion was that GED graduates could, indeed, successfully manage the coursework offered in the college curriculum, but they were not as successful academically when compared to traditional high school graduates.

Roeber (1950), Tyler (1954) (1956), D'Amico (1957), and Dressel and Schmid (1950) conducted research to determine whether higher GED total scores would improve the academic success of GED graduates enrolled in colleges. In each study it was found that GED graduates with higher scores did perform better academically. However, the conclusion of each of the researchers was that GED graduates could succeed in college even with the minimum scores required to pass the GED tests.

The research conducted at four-year colleges and universities tends to show that GED graduates do not perform as well academically as traditional high school graduates-- Tyler (1954), D'Amico (1957), Pipho (1967), Fugate (1972),

Roon (1972), Moore (1973), Quinn (1986), Pawasarat (1986), and others. However, Cervero (1983), in a national study of 13,000 GED graduates found that nearly 50% pursue further education within eighteen months of passing the GED and they typically enroll at two-year colleges rather than at four-year schools. The research conducted at two-year colleges generally shows that GED graduates perform academically as well as traditional high school graduates--Hannah (1972), Roy (1975), Ayers (1978), Wolf (1980), Wilson, et al (1981), and others. Klein and Grise (1987), in studying Florida's community colleges, found that traditional high school graduates had statistically significantly higher grade point averages than did GED graduates, but the difference was not great enough to be considered important from an academic viewpoint.

Research has also been conducted to determine if sex and age are factors in the academic success of GED graduates and traditional high school graduates. Russo (1969), Fugate (1972), Topp (1973), Murphy (1973), and others found that females have higher grade point averages than do males. Each of the researchers found that age was also a factor in academic success. Older students typically have higher grade point averages than do younger students.

The GED tests were developed to provide a method for students who had not graduated from high school to meet college admission requirements and to be successful in college

coursework. Research through the years has shown that passing the GED tests has met this goal. Tyler (1956), who was one of the authors of the GED tests, reviewed the research since 1942 and concluded that there is sufficient evidence from all of the available studies to justify the continued use of the GED tests as one criterion for admission to college in lieu of the requirement of a high school diploma. Sharon (1972), upon completion of a nationwide study of GED graduates, concluded that GED graduates should be given the same consideration for admission to higher education as traditional high school graduates and that they will earn grade point averages comparable to their traditional high school counterparts. Ayers (1978) stated that GED graduates should be encouraged to attend college and that college admission officers should enroll them on the same basis as traditional high school graduates. Wilson, et al (1981) concluded that colleges offering vocational education programs should recruit and admit GED graduates with full confidence in their ability to succeed. Swarm (1981) stated that passing the GED tests should continue to be used as a viable substitute for a traditional high school diploma. Kelin and Grise (1987) stated that the results of their study of Florida's community colleges should dispell the misconceptions held by educators concerning the capabilities of GED graduates in higher education settings.

The literature review indicated that there has been an ongoing investigation of the GED testing program since its inception in 1942. Numerous studies have been conducted comparing GED graduates and traditional high school graduates in postsecondary institutions. From the review of the literature it appears there are two opinions as to the postsecondary academic success of GED graduates when compared to traditional high school graduates. One opinion holds that academically GED graduates perform as well as or better than traditional high school graduates. The second opinion presents the converse of this by stating that GED graduates not only academically do not perform as well as traditional high school graduates, but they actually perform much lower.

The diversity of opinions on this topic provided the rationale for this study. The literature review indicated that differences of opinion existed for students enrolled at both four-year and two-year colleges, and that study samples usually included a small number of students. Many studies included only one college. The intent of this study was to research students who attended two-year community colleges and who were enrolled in technical and vocational programs. The North Carolina Community College System was chosen for this study because a state-wide study comparing GED and traditional high school graduates had not been conducted.

This study utilized variables found in the review of the literature as a foundation for comparing the postsecondary

success of GED and traditional high school graduates. The use of similar variables provided a basis for relating the results of this study to those previously conducted.

CHAPTER III

METHODOLOGY

The purpose of this study was to compare the postsecondary academic success of traditional high school graduates with that of GED graduates who enrolled in twelve selected North Carolina community colleges.

This chapter describes the subjects utilized for the study and how they were selected. It describes the instruments of the study and how they were used. A description of the data collection is included as well as the data analysis procedures.

Subjects

The study focused on students enrolled at selected North Carolina community colleges. The researcher initially intended to include students enrolled at all fifty-eight (58) community colleges. However, this was not feasible due to the large number of students this would involve and the sheer magnitude of data that would be collected. Therefore, the researcher decided to obtain a twenty percent sample (twelve community colleges) of the 58 North Carolina community colleges. In an attempt to obtain twelve representative community colleges the researcher selected four community

colleges from each of the three geographic regions of the state--west, central, and east. The community colleges in each geographic region were categorized by number of students enrolled. In each of the geographic regions, one community college was chosen from each of the following enrollment categories:

- a. under 1000 students enrolled
- b. over 1000 but less than 2000 students enrolled
- c. over 2000 but less than 3000 students enrolled
- d. over 3000 students enrolled

The community colleges were chosen on the basis of their Student Development Administrators' willingness to participate in the study and their capability of gathering and transferring necessary student data.

Enrollment at each of the fifty-eight community colleges was identified from the enrollment statistics published by the North Carolina Department of Community Colleges for the 1987 Fall Quarter (See Appendix A).

The researcher selected students who enrolled for the first time at the twelve community colleges during the 1987 fall quarter. These students included traditional high school graduates who completed four years of educational work and passed the necessary units of study for graduation from a public or private high school and GED graduates who successfully passed the Tests of General Educational

Development and were awarded high school equivalency certificates.

The researcher included students who initially enrolled in a community college for the 1987 fall quarter. This allowed a four-year time period since many community college students attend night classes and may take up to four years to complete an associate degree program. The researcher also decided to include only students who enrolled in vocational or technical programs as defined by the Department of Community Colleges. Students enrolled in College Transfer, General Education, Special Credit classes, or developmental studies curriculums would not be included. The rationale for this was that not all community colleges offer College Transfer or General Education curriculums and developmental studies and special credit curriculums are not degree or diploma granting curriculums.

Students were selected only if they had earned twelve or more cumulative credit hours within their vocational or technical curriculum. This twelve-hour requirement was used since a full-time student is normally defined as a student who enrolls for twelve or more credit hours per quarter. This eliminated those students who enrolled for one or two classes and who were not bona fide students in a technical or vocational curriculum. In addition, it eliminated those students who enrolled in technical or vocational curriculums but withdrew before completing one quarter.

Instruments

The Tests of General Educational Development (GED) are designed to measure the skills and concepts generally associated with the instruction of a regular high school curriculum. Each of the five tests that make up the GED has a multiple-choice format. In addition, an essay is required by the Writing Skills Test. Most test items require an understanding of broad concepts and generalizations, rather than the ability of students to remember specific details, facts, or definitions.

Test One: Writing Skills. This test consists of two parts. Part one is a multiple-choice test that measures the ability to edit and correct problems in sentence structure, usage, and mechanics within the context of one or more paragraphs. The test items require error recognition and sentence correction, sentence revision, and manipulation of sentence elements. Part two is an essay question to which students must respond in writing. The question presents a situation or issue to which students must give their point of view or their explanation. Part one allows seventy-five minutes for the completion of fifty-five questions with the score comprising approximately sixty to sixty-five percent of the composite score. Part two allows forty-five minutes and comprises thirty-five to forty percent of the composite score.

Test Two: Social Studies. This test measures the ability to use knowledge and information about fundamental social studies concepts. Mere recall and recitation of facts are not tested. The primary emphasis is on the measurement of integrated, comprehensive skills related to the overall study of social studies rather than on individual concepts from various subject areas. The questions require the student to demonstrate an understanding of basic principles and concepts through comprehension of the meaning and intent of information, applying information and ideas, distinguishing fact from opinion, drawing conclusions, identifying cause and effect relationships, and making judgments about information. Test questions are taken from history, economics, political science, geography, anthropology, psychology, and sociology. The text has sixty-four questions to be answered within eighty-five minutes.

Test Three: Science. Questions on the science test measure integrated concepts and principles of science rather than isolated disciplinary topics. Questions do not test only the recall of factual information, but require students to use information provided in the test questions or acquired through past education or life experiences. The test questions focus on assessing the students' ability to use this information and on concepts the student must use to solve problems and answer questions. Abstract reasoning and problem-solving ability are very important aspects of the test. They are included to

represent the type of thinking most often used in the field of science. Subject matter for the test questions is from biology, earth science, physics, and chemistry. The test has sixty-six questions to be answered within ninety-five minutes.

Test Four: Interpreting Literature and the Arts. The content of this test consists of materials from three content areas: popular literature, classical literature, and commentary about literature and arts. Test questions include fiction, prose nonfiction, poetry, and drama. The test does not include questions that require prior knowledge of literary works or familiarity with the language of literary analysis or criticism. Each question requires students to demonstrate an understanding of what is read, interpret the meaning of a passage, and draw conclusions implied, but not necessarily stated in the passage. The test has forty-five questions to be answered within sixty-five minutes.

Test Five: Mathematics. The test measures students' problem-solving skills in arithmetic, algebra, and geometry. The focus of the test questions is on the ability of students to solve mathematical problems in realistic contexts. A knowledge of and the ability to apply mathematical processes are crucial to success on the test. The questions do not focus on students' ability to perform complicated calculations, but rather they involve the steps to solve a problem. Some questions ask students to identify the correct way to set up a problem rather than to work out a full

solution. Graphs are used in many of the questions. Students are provided with a page of formulas to use in solving questions but they are not told which formulas to use. The test has fifty-six questions to be answered within ninety minutes.

The GED Tests are published in many different languages and are adapted for students with various handicaps. The tests are reviewed regularly and are updated as needed. Norming studies are periodically conducted using high school seniors. The norming studies may reveal the need for adjustments in scores so that they represent the levels of achievement of recent high school graduates. GED candidates must demonstrate that they have reached at least the seventieth percentile when compared to recent traditional high school graduates.

Minimum scores for passing the GED Tests were established by the Commission on Educational Credit and Credentials. However, each state may require a higher score. In order for a student to pass the GED, the Commission requires one of the following minimum criteria:

1. A minimum standard score of forty on each of the five tests in the battery or
2. An average standard score of at least forty-five on the tests in the battery.

(1989 Examiner's Manual, p. 3.9-4)

This recommendation represents a judgment that requirements should be neither so high as to represent levels of achievement far above that demonstrated by recent high school graduates nor so low as to threaten the credibility of the high school equivalency credential (p. 3.9-4).

In North Carolina the minimum requirement for passing the GED is that students must not have a standard score below thirty-five on any of the tests and that the average standard score on the five tests must be at least forty-five. The total score on the five tests must be 225 or higher with no single test score below thirty-five. Based on the 1987 national norming study conducted by the Commission, seventy percent of high school graduates attain this minimum score on the GED.

The content of the GED tests is intended to represent a sample of the expected outcomes of four years of high school. The tests were developed after careful review of the high school curriculum, recommendations detailing the content areas covered in the curriculum, and the relative emphasis within each subject area. The tests contain questions requiring the use of concepts, general knowledge, and thinking skills with relatively few questions about isolated details, definitions, or specific facts. The GED tests measure the ability of one to use information rather than the ability to remember specific facts and details. The items on the GED tests cover

a wide range of subjects and vary in difficulty from easy to difficult (Malizio and Whitney, 1982, p. 1).

A detailed description of the five GED subtests will be explained in Chapter III of this study when instruments are discussed.

There is an abundance of technical information relating to the validity and reliability of the GED tests. Whitney, Malizio, and Patience (1985) consolidated this information into one document which was published in Educational and Psychological Measurement (1986).

Reliability

The reliability of a test's scores refers to the degree of accuracy or to what extent would one be expected to receive a similar score if one took the same test again, if a different form of the same test were taken or if the same test were taken on different days. The reliability of a test is affected both by the characteristics of the test and by the characteristics of those taking the test (Whitney et al., 1985, p. 1).

Two methods of reliability were utilized in assessing the reliability of the GED tests--internal consistency reliability and parallel or alternate forms reliability. The KR20 coefficients were calculated for seven GED test forms administered in 1983 and 1985. Their values indicate that the GED tests have a high degree of internal consistency

reliability. Likewise, the standard error of measurement calculated for parallel forms reliability are within the range generally considered to be satisfactory (Whitney, Malizio, and Patience, 1986, pp. 690-692).

Validity

The validity of a test refers to the significance of its scores or to what degree one's scores are interpretable as measures of the intended knowledge and skills. Three elements of validity were investigated in determining the validity of the GED tests--content validity, concurrent validity, and predictive validity (pp. 690-697).

Since the GED tests are intended to measure the expected outcomes of four years of high school, the single most important measure of validity is the content validity of the tests. The GED tests were developed after careful review of the high school curriculum and included the content areas covered in the curriculum and the emphasis placed on each area. The test items were written by experienced educators and reviewed by other educators and subject matter specialists. This involvement of educators in the field adds assurance of content validity. However, the degree of content validity must be based on experts' subjective analysis of the test-curriculum similarities and differences. There is not a statistical method to compute a coefficient of content validity, but experts who are not directly involved in the development of the tests generally judge the GED tests to

reflect the outcomes of a high school curriculum and measure these outcomes fairly and adequately (pp. 692-692).

Since the GED tests measure whether one has attained the skills necessary to be equivalent to a graduate of a traditional high school program, it is necessary that current validity exists between the two standards. GEDTS regularly administers the GED tests to national samples of high school graduating seniors. Results show that 30% of the current graduating high school seniors cannot pass the GED tests (Malizio and Whitney, 1982, p. 10) while in 1989 31.6% of persons taking the GED tests failed to attain passing scores (1989 GED Statistical Report, p. 5). The GED Performance Study final results from 1988 show that the average total battery standard score was identical (50.0) for GED graduates and high school seniors (American Council on Education, 1990, p. 8). Studies providing scores like these have been used since the beginning of the GED testing program to relate the level of achievement for GED graduates to that demonstrated by recent high school graduates. The GED tests scores show substantial correlations with similar tests given to high school seniors (Whitney, Malizio, Patience, 1986, p. 695).

Predictive validity of the GED tests can be assessed in two ways. First, is the degree to which employers and postsecondary schools confer equivalent status to GED graduates compared to those who graduate from a traditional high school program. In a national study it was found that

96%-98% of the companies surveyed gave GED graduates the same initial levels of employment, the same starting salary, and the same opportunities for advancement as were given to traditional high school graduates (p. 696). Another national survey reported that 95% of the nation's postsecondary educational institutions consider GED graduates and traditional high school graduates equal with regard to admission (p. 696). A second aspect of predictive validity is the degree to which the GED tests serve their intended purpose for those taking the tests. National and state studies have shown that many of the expectations of the GED test examinees are met after passing the tests (p. 696). That is to say, GED graduates receive increases in salary, acceptance to educational institutions and training programs, and other benefits as expected (p. 696).

Data Collection

Each of the community colleges in the North Carolina Community College System uses a computer system to process student records. The computer system is generally referred to as PRIME which is the trademark for PRIME Computer Company.

The Student Development Administrators at the twelve community colleges were contacted to determine their willingness to participate in the study and to provide necessary data on selected students (see Appendix B).

Permission was obtained from the North Carolina Department of Community Colleges to use the PRIME Networking System to transfer data on students to a single computer file for processing (see Appendix C). A programmer was retained to write computer programs to accomplish the necessary computer transactions for gathering appropriate student data and for transferring it to one file.

The following information was gathered on each student included in the study:

1. Major
2. Cumulative grade point average
3. Sex
4. Birthdate (age)
5. Method by which the students earned their high school diploma.

Students were not identified in any manner in strict observance of the Family Rights to Privacy Act of 1972 as amended.

Data Analysis

The student data were analyzed statistically using descriptive statistics and analysis of variance. The statistical computer software used was SAS (SAS/STAT User's Guide). All statistical computations were conducted at the

Academic Computer Center of the University of North Carolina at Greensboro.

In the analysis of each research question the factors of method by which students earned their high school diploma, sex, age, and major as well as all possible interactions of these factors were adjusted for statistically. Each effect or interaction of effects was evaluated while controlling for the variance of all other effects within the model. Community college identity was used as a blocking factor to partition out potential sources of bias related to differential rates of grade inflation across the community colleges.

A four-way analysis of variance (ANOVA) with a blocking factor of community college identity was used to determine whether there were significant differences among mean grade point averages for targeted groups of students. A level of significance of .05 was utilized to determine whether there existed a statistically significant difference between these mean grade point averages.

In using the four-way ANOVA each targeted effect associated with each research question was evaluated while controlling for all other effects in the ANOVA. The comparison was executed by evaluating Type III sums of squares in the GLM SAS procedure and defined using the LSMEANS option of this procedure (SAS/STAT User's Guide).

The following research questions were analyzed statistically using the statistical procedures described in the previous paragraphs.

1. Is there a significant difference between the postsecondary academic success of traditional high school graduates and that of GED graduates enrolled in the community college vocational and technical programs?
2. Is there a significant difference by sex between the postsecondary academic success of traditional high school graduates and that of GED graduates?
3. Is there a significant difference by age (traditional college age students vs. nontraditional college age students) between the postsecondary academic success of traditional high school graduates and that of GED graduates?
4. Do the interactions of such factors as age, sex, and method by which students receive their high school diplomas (traditional high school graduates or GED graduates) affect postsecondary academic success?

CHAPTER IV

ANALYSIS OF DATA

The purpose of this study was to compare the postsecondary academic success of students who graduated from traditional four-year high school programs with students who completed studies that led to a certificate of high school equivalency or the GED. The focus of the study was on students enrolled in twelve selected North Carolina community colleges.

Description of Study Sample

Twelve community colleges were selected from the 58 community colleges in North Carolina to provide a 20% representative sample. The selection of these community colleges was based on enrollment and geographic location within the state. The twelve community colleges selected are shown in Table 3.

Table 3

Community Colleges Included in the Study

Community College	Geographic Location	Enrollment Classification (No. of Students)
McDowell Technical Comm. College	West	Under 1000
Wilkes Community College	West	1000 - 1999
Western Piedmont Comm. College	West	2000 - 2900
Gaston College	West	over 3000
Montgomery Community College	Central	under 1000
Randolph Community College	Central	1000 - 1999
Davidson County Comm. College	Central	2000 - 2999
Forsyth Technical Comm. College	Central	over 3000
Roanoke-Chowan Comm. College	East	under 1000
Southeastern Community College	East	1000 - 1999
Cape Fear Community College	East	2000 - 2999
Pitt Community College	East	over 3000

The Student Development Administrators at each of the twelve community colleges were contacted (see Appendix B) and requested to participate in the study. The following data were then collected on the students included in the study from

each of the community colleges--major, cumulative grade point average, sex, birthdate, and the method by which students earned their high school diplomas. All students who were enrolled in technical or vocational programs for the first time during the 1987 Fall Quarter and who had earned a minimum of twelve credit hours were selected for inclusion in this study.

Table 4 shows the enrollment at each of the twelve community colleges and the number of students who met the criteria for being included in the study.

A total of 3,429 students were selected from the twelve community colleges. The total enrollment for the schools was 22,551. The students included in the study represented 15.21% of the total student enrollment at the twelve community colleges. The number of students who met the criteria to be included in the study ranged from a high of 429 at Western Piedmont Community College to a low of 95 at McDowell Technical Community College. Roanoke-Chowan Community College had the highest percentage of its enrollment (25.59%) included in the study and Wilkes Community College had the lowest percentage (7.19%).

Table 4

Students Included in the Study

Community College	Enrollment ^a	n ^b	Percentage ^c
McDowell Technical Comm. College	299	95	31.77
Wilkes Community College	1808	130	7.19
Western Piedmont Comm. College	2160	479	22.18
Gaston College	3083	443	14.37
Montgomery Community College	547	118	21.57
Randolph Community College	1198	293	24.46
Davidson County Comm. College	2193	299	13.63
Forsyth Technical Comm. College	3817	473	12.39
Roanoke-Chowan Comm. College	676	173	25.59
Southeastern Community College	1201	162	13.49
Cape Fear Community College	2397	458	19.11
Pitt Community College	3172	306	9.65
Total	22551	3429	15.21

^aEnrollment was based on 1987 Fall Quarter enrollment statistics published by the North Carolina Department of Community Colleges (see Appendix A)

^bNumber of students who met the selection criteria to be included in the study

^cNumber of students selected for the study divided by the total enrollment at the college X 100

There were 260 GED graduates and 3,169 traditional high school graduates making a total of 3,429 students in the study. GED graduates comprised 7.58% of the total student enrollment and traditional high school graduates comprised 92.42% of the total enrollment. The composition of the study sample ranged from a high of 22.03% GED graduates at Montgomery Community College to a low of 3.08% at Wilkes Community College. Table 5 shows the number and percentage of GED and traditional high school graduates at each of the twelve community colleges.

Table 5

Community College Composition of Students by Diploma Earned

Community College	GED Graduate		Traditional High School Graduate	
	Fre- quency	Percent- age	Fre- quency	Percent- age
McDowell Technical Community College	11	11.58	84	88.42
Wilkes Comm. College	4	3.08	126	96.92
Western Piedmont Community College	25	5.22	454	94.78
Gaston College	29	6.55	414	93.45
Montgomery Comm. College	26	22.03	92	77.97
Randolph Comm. College	24	8.19	269	91.81
Davidson County Community College	10	3.34	289	96.66
Forsyth Tech. Comm. Coll.	48	10.15	425	89.85
Roanoke-Chowan Community College	14	8.09	159	91.91
Southeastern Comm. College	9	5.56	153	94.44
Cape Fear Comm. College	43	9.39	415	90.61
Pitt Community College	17	5.56	289	94.44
Totals	260	7.58	3169	92.42

The study sample was composed of 1,511 males and 1,918 females. Males comprised 44.07% of the sample and females 55.93%. Randolph Community College had the highest percentage of females with 76.88%. Cape Fear Community College had the highest percentage of males at 64.85%. Table 6 shows the percentage and number of males and females at the twelve community colleges.

Table 6

Community College Composition of Students by Sex

Community College	Male		Female	
	Fre- quency	Percent- age	Fre- quency	Percent- age
McDowell Technical Community College	32	33.68	63	66.32
Wilkes Comm. College	58	44.62	72	55.38
Western Piedmont Community College	150	31.32	329	68.68
Gaston College	225	50.79	218	49.21
Montgomery Comm. College	65	55.08	53	44.92
Randolph Comm. College	116	39.59	177	60.41
Davidson County Community College	106	35.45	193	64.55
Forsyth Technical Community College	250	52.85	223	47.15
Roanoke-Chowan Community College	40	23.12	133	76.88
Southeastern Comm. College	57	35.19	105	64.81
Cape Fear Comm. College	297	64.85	161	35.15
Pitt Community College	115	37.58	191	62.42
Totals	1511	44.07	1918	55.93

The study sample had 2,631 technical students and 798 vocational students. Technical students comprised 76.73% of the total and vocational students 23.27%. Davidson County Community College had 91.64% technical students which was the highest percentage from the community colleges studied. Montgomery Community College had the lowest percentage of technical students at 48.31%. A comparison of the number and percentage of technical and vocational students is shown in Table 7.

Table 7

Community College Composition of Students by Major

Community College	Technical		Vocational	
	Fre- quency	Percent- age	Fre- quency	Percent- age
McDowell Technical Community College	70	73.68	25	26.32
Wilkes Comm. College	87	66.92	43	33.08
Western Piedmont Community College	400	83.51	79	16.49
Gaston College	347	78.33	96	21.67
Montgomery Comm. Coll.	57	48.31	61	51.69
Randolph Comm. Coll.	252	86.01	41	13.99
Davidson County Community College	274	91.64	25	8.36
Forsyth Technical Community College	324	68.50	149	31.50
Roanoke-Chowan Community College	112	64.74	61	35.26
Southeastern Comm Coll	125	77.16	37	22.84
Cape Fear Comm. Coll.	337	73.58	121	26.42
Pitt Community College	246	80.39	60	19.61
Totals	2631	76.73	798	23.27

The ages of the study sample are shown as traditional or nontraditional college age. Students whose age at the time of enrollment was 21 or less were defined as traditional college age, while those over age 21 were considered nontraditional college age. There were 1,831 traditional college age students and 1,598 nontraditional college age students. Traditional college age students comprised 53.4% of the total study sample and nontraditional college age students 46.6%. Table 8 shows the composition of the study sample by traditional and nontraditional college age groups.

Table 8

Community College Composition of Students by Age Group

Community College	Nontraditional		Traditional	
	Fre- quency	Percent- age	Fre- quency	Percent- age
McDowell Technical Community College	58	61.05	37	38.95
Wilkes Comm. College	13	10.00	117	90.00
Western Piedmont Community College	217	45.30	262	54.70
Gaston College	179	40.41	264	59.59
Montgomery Comm. Coll.	80	67.80	38	32.20
Randolph Comm. College	129	44.03	164	55.97
Davidson County Community College	118	39.46	181	60.54
Forsyth Technical Community College	270	57.08	203	42.92
Roanoke-Chowan Community College	102	58.96	71	41.04
Southeastern Comm Coll	66	40.74	96	59.26
Cape Fear Comm. Coll.	214	46.72	244	53.28
Pitt Community College	152	49.67	154	50.33
Totals	1598	46.60	1831	53.40

Cumulative grade point averages were collected for each of the 3,429 students in the study. The mean grade point averages from each of the twelve community colleges and an overall mean grade point average appear in Table 9. The mean grade point average ranged from a high of 3.130 at Montgomery Community College to a low of 2.504 at Southeastern Community College. The overall grade point average for all twelve community colleges was 2.782.

Table 9

Grade Point Averages for Students in the Study

Community College	n	mean	Standard Deviation
McDowell Technical Comm. Coll.	95	2.986	.749
Wilkes Community College	130	2.758	.626
Western Piedmont Comm. College	479	2.772	.699
Gaston College	443	2.820	.755
Montgomery Community College	118	3.130	.784
Randolph Community College	293	2.827	.849
Davidson County Comm. College	299	2.779	.765
Forsyth Technical Comm. Coll.	473	2.890	.727
Roanoke-Chowan Comm. College	173	2.909	.770
Southeastern Community College	162	2.504	.748
Cape Fear Community College	458	2.589	.863
Pitt Community College	306	2.771	.835
Overall	3429	2.782	.782

Summary Description of Study Sample

Twelve community colleges were included in the study. Three thousand, four hundred and twenty-nine (3,429) students enrolled at these twelve community colleges met the criteria

for inclusion in the study. Type of high school diploma earned, sex, age, major, and cumulative grade point average were collected for each of these students.

Two hundred and sixty (260) GED graduates and 3,169 traditional high school graduates were included. GED graduates comprised 7.58% of the study sample and traditional high school graduates 92.42%. The study was comprised of 1,511 males (44.07%) and 1,918 females (55.93%). Traditional college age students (age 21 or less when first enrolled) accounted for 53.40% (1,831) of the students in the study while nontraditional college age students accounted for 46.60% (1,598). The majority of the students (2,631 or 76.73%) were enrolled in technical programs compared to vocational programs which enrolled 798 students (23.27%). The mean cumulative grade point average of the 3,429 students was 2.782 based on a 4.000 scale.

Table 10 summarizes the student data collected from the twelve community colleges included in the study.

Table 10

Composition of Students--Summary of the Twelve Community
Colleges' Combined Data (N = 3,429)

	Frequency	Percentage
Type Diploma Earned		
GED Graduate	260	7.58
Traditional High School Graduate	3169	92.42
Sex		
Male	1511	44.07
Female	1918	55.93
Major		
Technical	2631	76.73
Vocational	798	23.27
Age Group		
Nontraditional college age	1598	46.60
Traditional college age	1831	53.40

Analysis of Research Questions

This study compared the postsecondary academic performances of GED graduates and traditional high school graduates. The study focused on students enrolled at twelve selected community colleges in North Carolina for the first time in the 1987 Fall Quarter. Students included in the study had completed twelve or more cumulative credit hours of coursework in either a vocational or technical program at their community college. A total of 3,429 students from the twelve community colleges was selected for the study. Data collected on the students included their major, cumulative grade point average, sex, birthdate, and the method by which they earned their high school diploma.

Four research questions were developed to compare the postsecondary academic success of GED graduates and traditional high school graduates. The data collected on the students from the twelve community colleges were analyzed using descriptive statistics and analysis of variance by SAS (SAS/STAT User's Guide) at the University of North Carolina at Greensboro Academic Computer Center.

In the analysis of each research question the factors of method by which students earned their high school diploma, sex, age, and major as well as all possible interactions of these factors were taken into account. The results were statistically adjusted for by controlling for the variance of

other factors within the model in the performance of the four research questions analyses. Community college identity was used as a blocking factor to partition out potential sources of bias related to differential rates of grade inflation across the community colleges.

A four-way analysis of variance (ANOVA) with a blocking factor of community college identity was used to determine whether there were significant differences between mean grade point averages for specific effects. A level of significance of .05 was utilized to determine whether there existed a statistically significant difference between these mean grade point averages.

In using the four-way ANOVA each targeted effect was evaluated while controlling for all other effects in the ANOVA. The comparison was executed by evaluating Type III sums of squares in the GLM SAS procedures and defined using the LSMEANS option of this procedure (SAS/STAT User's Guide).

Following is an analysis of the response to each of the four research questions.

Research Question #1: Is there a significant difference between the postsecondary academic success of traditional high school graduates and that of GED graduates enrolled in community college vocational and technical programs?

The interaction of type of high school diploma (GED graduate or traditional high school graduate) with major (technical or vocational programs) was analyzed within this ANOVA and found to be statistically significant. The F-Value for this interaction was 13.20 with 1,3402 degrees of freedom and $p = .0003$. GED graduates enrolled in technical programs earned a mean grade point average of 2.806 in comparison with traditional high school graduates of 2.793. This difference was not significant ($P = .8652$). However, for students enrolled in vocational programs traditional high school graduates earned a higher mean grade point average (2.906) than GED graduates (2.367). This difference was significant ($p < .0001$). A summary of mean grade point averages for GED graduates and traditional high school graduates enrolled in vocational and technical programs is shown in Table 11.

Table 11

Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Major

	GED Graduates		Traditional High School Graduates		GED and Traditional High School Graduates	
Major	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average
Vocational	71	2.367	727	2.906	798	2.637
Technical	189	2.805	2442	2.793	2631	2.800
Overall	260	2.587	3169	2.850	3429	2.782

Research Question #2: Is there a significant difference by sex between the postsecondary academic success of traditional high school graduates and that of GED graduates?

The interaction of type of high school diploma (GED graduate or traditional high school graduate) with sex (male or female) within this ANOVA revealed that there was not a

statistically significant interaction. The F-Value was 0.15 with 1,3402 degrees of freedom and a $p = .6954$.

Female students attained a higher mean grade point average (2.776) than males (2.660) whether they were GED graduates or traditional high school graduates ($p = .1257$). A summary of the mean grade point averages for these students is shown in Table 12.

Table 12

Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Sex

Sex	GED Graduates		Traditional High School Graduates		GED and Traditional High School Graduates	
	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average
Male	109	2.514	1402	2.8065	1511	2.660
Female	151	2.660	1767	2.8930	1918	2.776
Overall	260	2.587	3169	2.8500	3429	2.782

Research Question #3: Is there a significant difference by age (traditional college age students vs. nontraditional college age students) between the postsecondary academic success of traditional high school graduates and that of GED graduates?

The interaction of type of high school diploma (GED graduate or traditional high school graduate) with age (traditional college age or nontraditional college age) within this ANOVA revealed that there was not a statistically significant interaction. The F-Value for these variables was 0.18 with 1,3402 degrees of freedom and a $p = .6750$. A summary of the mean grade point averages for these students is shown in Table 13.

Nontraditional college age students had a higher mean grade point average than traditional college age students regardless of how they earned their high school diploma. Nontraditional college age students had a mean grade point average of 3.003 and traditional college age students had a 2.433 mean grade point average. When statistically adjusting for all other factors and their interactions this difference in mean grade point average was very significant ($p < .0001$).

Table 13

Summary of Postsecondary Academic Success of Traditional High School and GED Graduates by Age

Age	GED Graduates		Traditional High School Graduates		GED and Traditional High School Graduates	
	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average	Fre-quency	Mean grade point average
Traditional College Age	45	2.274	1786	2.593	1831	2.433
Nontraditional College Age	215	2.900	1383	3.107	1598	3.003
Overall	260	2.587	3169	2.850	3429	2.782

Research Question #4: Do the interactions of such factors as age, sex, and method by which students earned their high school diplomas (traditional high school graduates or GED graduates) affect postsecondary academic success?

The three-way interaction of age, sex, and method by which students earned their high school diploma was analyzed within this ANOVA and did not reveal a statistically

significant interaction. The F-Value for this comparison was .14 with 1,3402 degrees of freedom and $p = .7079$.

Other Results

In addition to providing the analysis for the four research questions the four-way ANOVA furnished other interactions and main effects related to the academic comparison of GED graduates and traditional high school graduates. The four-way interaction of method by which students earned their high school diploma, sex, major, and age did not reveal a statistically significant interaction (F-Value = 2.04 with 1,3402 degrees of freedom and $p = .1538$) among mean grade point averages. Similarly, the three-way interaction of method by which students earned their high school diploma, sex, and major did not reveal a statistically significant interaction (F-Value = .06 with 1,3402 degrees of freedom and $p = .8087$).

However, there was a significant interaction among the mean grade point averages in the three-way interaction of method by which students earned their high school diploma, major, and age. The F-Value was 5.13 with 1,3402 degrees of freedom and $p = .0235$. The three-way interaction of sex, major, and age also furnished a statistically significant interaction with an F-Value of 5.84 with 1,3402 degrees of freedom and $p = .0157$.

There were three, two-way interactions that were not included in the research questions. Two of these (sex with major, and sex with age) did not reveal a statistically significant interaction among mean grade point averages. However, female technical and female nontraditional college age students earned significantly higher mean grade point averages (2.897 and 3.090 respectively). The third two-way interaction (major with age) was statistically significant. The F-Value was 4.08 with 1,3402 degrees of freedom and $p = .0434$.

The main effects within the four-way ANOVA each revealed a significant difference between mean grade point averages except for sex which was not statistically significant. A summary of mean grade point averages for these main effects is shown in Table 14.

The most significant main effect was between traditional and nontraditional college age students. The F-Value for the two age groups was 56.67 with 1,3402 degrees of freedom and $p < .0001$. Nontraditional college age students had a much higher grade point average (3.003) than did traditional college age students (2.433).

The main effect of sex did not reveal a statistically significant difference in mean grade point averages between males and females. Female students' mean grade point average of 2.776 was higher than the males' mean grade point average of 2.660 but was not significantly higher. The F-Value for

this comparison was 2.35 with 1,3402 degrees of freedom and $p = .1257$.

The method by which students earned their high school diploma revealed a statistically significant difference between GED graduates and traditional high school graduates. GED graduates earned a mean grade point average of 2.587 which was significantly lower compared to traditional high school graduates who earned a 2.850 mean grade point average. The F-Value for this comparison was 12.04 with 1,3402 degrees of freedom and $p = .0005$.

The major in which students were enrolled revealed a significant difference in mean grade point average. Technical students earned a mean grade point average of 2.800 compared to a mean grade point average of 2.637 for students enrolled in vocational programs. The F-Value was 4.56 with 1,3402 degrees of freedom and $p = .0328$.

Table 14

Summary of Postsecondary Academic Success by Age, Sex,
Method by Which High School Diploma was Earned,
and Major

Variable	Frequency	Mean Grade Point Average
Age		
Nontraditional College Age	1598	3.003
Traditional College Age	1831	2.433
Sex		
Male	1511	2.660
Female	1918	2.776
Method By Which High School Diploma was Earned		
GED Graduate	260	2.587
Traditional High School Grad.	3169	2.850
Major		
Vocational	798	2.637
Technical	2631	2.800

Summary Analysis of Research Questions

Four research questions were developed to compare the postsecondary academic success of GED graduates with traditional high school graduates. In the analysis of each research question the factors of method by which students earned their high school diploma, sex, age, and major as well as all possible interactions of these factors were taken into account. All possible effects were statistically adjusted for in the performance of the four research question analyses. Each effect or interaction of effects was evaluated while controlling for the variance of all other effects within the model. Community college identity was used as a blocking factor to partition out potential sources of bias related to differential rates of grade inflation across the community colleges.

A four-way analysis of variance (ANOVA) with a blocking factor of community college identity was used to determine whether there were significant differences between mean grade point averages for specific effects. A level of significance of .05 was utilized to determine whether there existed a statistically significant difference between these mean grade point averages.

In using the four-way ANOVA each targeted effect was evaluated while controlling for all other effects in the ANOVA. The comparison was executed by evaluating Type III

sums of squares in the GLM SAS procedures and defined using the LSMEANS option of this procedure (SAS/STAT User's Guide).

The following paragraphs summarize the results found in answering the four research questions.

The interaction of type of high school diploma and major revealed a statistically significant interaction in mean grade point averages. GED graduates enrolled in technical programs earned a higher, but not significantly higher mean cumulative grade point average (2.806) than did traditional high school graduates (2.793). However, for students enrolled in vocational programs traditional high school graduates earned a significantly higher mean grade point average (2.906) than GED graduates (2.367).

The interaction of type of high school diploma with sex produced no statistically significant interaction in mean grade point averages. Female students attained a higher mean grade point average than males whether they were GED graduates or traditional high school graduates.

The interaction of type of high school diploma with age disclosed that there was no statistically significant interaction in mean grade point averages. Nontraditional college age students had a higher mean grade point average than traditional college age students regardless of how they earned their high school diploma.

The three-way interaction of age, sex, and method by which students earned their high school diploma did not reveal a statistically significant interaction.

The four-way interaction of method by which students earned their high school diploma, sex, major, and age did not reveal a significant interaction in mean grade point averages. Likewise, the three-way interaction of method by which students earned their high school diploma, sex, and age was not statistically significant.

The three-way interactions (method by which students earned their high school diploma, major, and age; and sex, major, and age) displayed statistically significant interactions in the mean grade point averages.

Among the two-way interactions only major with age revealed a significant interaction in mean grade point average. Sex with major and sex with age did not show any significant interaction.

The main effects of this four-way ANOVA showed some significant differences in mean grade point averages. Nontraditional college age students had a significantly higher mean grade point average than traditional college age students, GED graduates earned a significantly lower mean grade point average than traditional high school graduates, and students enrolled in technical programs had significantly higher mean grade point averages than did students enrolled in

vocational programs. Females had higher mean grade point averages than males but they were not significantly higher.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter V includes a summary of the study, conclusions based on the analysis of data, recommendations for colleges, and recommendations for further study.

Summary of the Study

The primary purpose of this study was to compare the postsecondary academic success of students who graduated from traditional four-year high school programs with students who completed studies that led to a certificate of high school equivalency (GED). The secondary purpose of the study was to provide educational policy makers with pertinent data upon which to base policy decisions, budget requests, and programs regarding the GED for the North Carolina Community College system.

The study focused on students enrolled at a representative sample of twelve of North Carolina's fifty-eight community colleges. Community colleges were selected as being representative of the 58 community college system on the basis of their enrollment and geographic location within the state. Data were gathered on students who enrolled for the first time at the twelve community colleges during the 1987

Fall Quarter. These students included traditional high school graduates and GED graduates who were enrolled in vocational or technical programs and who had completed twelve or more credit hours within their program of study. The following data were gathered on each student: Major (technical or vocational), sex, age (traditional college age or nontraditional college age), cumulative grade point average, and method by which the students earned their high school diploma (traditional high school graduates or GED graduate).

Three thousand, four hundred, and twenty-nine (3,429) students were enrolled at the twelve community colleges and met the criteria to be included in the study. Two hundred and sixty (260) GED graduates (7.58%) and 3,169 traditional high school graduates (92.42%) were included. The study was composed of 1,511 males (44.07%), 1,918 females (55.93%), 1,831 traditional college age students (53.40%), and 1,598 nontraditional college age students (46.60%). The majority of students were enrolled in technical programs (2,631 or 76.73%) compared to vocational programs which enrolled 798 students (23.27%). The mean grade point average for students included in the study was 2.782 based on a 4.000 scale.

Four research questions were developed to compare the postsecondary academic success of GED graduates and traditional high school graduates. The research questions

investigated interactions of majors, sex, and ages with the method by which students earned their high school diploma and the effect of these factors on postsecondary success.

GED graduates enrolled in technical programs earned a mean grade point average of 2.806 compared to traditional high school graduates of 2.793. This difference was not statistically significant. Traditional high school graduates earned a significantly higher mean grade point average (2.906) than GED graduates (2.367) in vocational programs.

Female students attained a mean grade point average of 2.776 and males 2.660. This difference was not statistically significant.

Nontraditional college age students had a higher mean grade point average (3.003) than traditional college age students (2.433) regardless of how they earned their high school diploma. This difference was statistically significant.

The three-way interaction of age, sex, and method by which students earned their high school diploma was not significant.

The four-way ANOVA used to analyze the research questions also provided additional interactions that were important in comparing academic success of GED graduates and traditional high school graduates. A four-way interaction of method by which students earned their diploma, sex, major and age found no significant interaction among the mean grade point averages. Similarly, the three-way interaction of method by

which students earned their high school diploma, sex, and major did not reveal a significant interaction of mean grade point averages. Likewise, the two-way interactions of sex with major and sex with age did not show statistically significant interactions among mean grade point averages.

However, the three-way interaction of method by which students earned their high school diploma, major, and age and the three-way interaction of sex, major, and age both revealed significant interaction among the mean grade point averages. The two-way interaction of major and age also displayed a statistically significant interaction among mean grade point averages.

The main effects of this four-way ANOVA each showed significant differences in mean grade point averages except for sex which was not statistically significant. Nontraditional college age students had a significantly higher mean grade point average (3.003) than traditional college age students (2.433), female students' mean grade point average (2.776) was higher but not significantly higher than male students' (2.660), and GED graduates earned a significantly lower mean grade point average (2.587) than traditional high school graduates (2.850), and technical students had significantly higher mean grade point averages than vocational students.

Conclusions

The purpose of this study was to compare the postsecondary academic success of GED graduates and traditional high school graduates. Twelve community colleges across the state were selected to be representative of the 58 community college system on the basis of their geographic location within the state and the size of their enrollments. A total of 3,429 students were studied to determine their academic success in vocational and technical programs.

The review of literature disclosed two schools of thought concerning the academic success of GED graduates compared to the academic success of traditional high school graduates. One opinion asserted that GED graduates performed academically as well as traditional high school graduates while the other stated that GED graduates did not perform academically as well as traditional high school graduates and actually performed much lower academically.

The findings of this study support the school of thought advancing the opinion that GED graduates do not succeed academically as well as traditional high school graduates. The results showed that the academic success of GED graduates enrolled in vocational and technical programs at the twelve North Carolina community colleges was significantly lower than the academic success of traditional high school graduates. The mean grade point average of GED graduates was 2.587

compared to the mean grade point average of traditional high school graduates which was 2.850.

Traditional high school graduates enrolled in vocational programs had a significantly higher ($p < .0001$) mean grade point average (2.906) than GED graduates (2.367) enrolled in vocational programs. However, when enrolled in technical programs GED graduates succeeded academically as well as traditional high school graduates. This finding is meaningful since 76.73% of the 3,429 students in this study were enrolled in technical programs. This finding corroborates the research of Sharon (1972), Ayers (1978), Wolf (1980), Wilson, et al (1981), and others who found that GED graduates performed academically as well as traditional high school graduates.

Based on the findings of this study it is concluded that GED graduates did not perform academically as well as traditional high school graduates overall. However, when enrolled in technical programs GED graduates' academic performance was as good as traditional high school graduates.

Four research questions were formulated to compare the postsecondary academic success of GED graduates and traditional high school graduates within different interactions. The first of these research questions addressed the interaction of major (i.e. technical or vocational) with the type of high school diploma earned by students. Through the analysis of the data related to this question it was concluded that GED graduates enrolled in technical programs

performed academically as well as traditional high school graduates. Conversely, traditional high school graduates performed higher academically than GED graduates in vocational programs. The investigator had postulated that the opposite would be true--that traditional high school graduates would perform higher academically than GED graduates in technical programs. This assumption was based on the literature review of D'Amico (1957), Pipho (1967), Fugate (1972), Quinn (1986), and others who stated that at four-year colleges and universities traditional high school graduates performed higher academically than GED graduates. Since technical programs are considered more rigorous academically than vocational programs the investigator hypothesized that traditional high school graduates would perform higher in the technical programs. However, this hypothesis was rejected.

The second research question examined the interaction of sex with the type of high school diploma earned. Fugate (1972) had found that sex was a significant factor in academic performance. He found that female students performed significantly higher than males academically. The analysis of data regarding the interaction of sex with type of diploma earned found that females performed higher academically but not significantly higher than males regardless of the type of diploma earned. The investigator concluded that females performed higher academically than males, but the interaction of sex with the type of high school diploma earned does not

affect the academic success of GED and traditional high school graduates.

The third research question explored the interaction of age with the type of high school diploma earned. For the purpose of this comparison student ages were divided into two groups--traditional college age (age 21 or less) and nontraditional college age (age 22 and older). Russo (1969), Topp (1973), Murphy (1973), and others found age to be a significant factor in academic performance in college. The results of this study revealed that age was the most significant main effect in academic success ($F\text{-Value} = 56.67$ with 1,3402 degrees of freedom and $p < .0001$). However, the interaction of age and method by which students earned their high school diploma did not reveal a statistically significant interaction in academic performances. The investigator concluded that age was a major factor in the academic success of both GED graduates and traditional high school graduates, and that nontraditional college age students performed significantly higher academically than traditional college age students regardless of whether they were GED or traditional high school graduates.

The last research question inquired whether the interactions of sex, age, and method by which students earn their high school diplomas affect postsecondary success. The three-way interaction did not reveal any significant interaction. The investigator concluded that collectively

these factors did not produce a significant difference in academic performance.

Recommendation to Colleges

This study provided the basis for the following recommendations to community colleges concerning the admission of students who have earned the GED diploma.

1. Community colleges should increase their recruitment efforts and encourage GED graduates to enroll at a local community college especially in technical programs. In 1987, 16,765 or 20.3% of all high school diplomas awarded in North Carolina were GED diplomas (Carnegie Foundation, 1989, p.38). Of these GED diploma recipients, 61.3% indicated they planned to pursue further education. However, only 7.58% of the sample studied were GED graduates.
2. Admissions officers should admit GED graduates to technical programs on the same basis as traditional high school graduates and should expect their postsecondary academic performance to be equal to that of traditional high school graduates. Special counseling should be afforded GED graduates who wish to enroll in vocational programs.
3. Since GED graduates performed academically as well as traditional high school graduates in 76.7% of the

students studied, a short, concise brochure should be developed by North Carolina community colleges and disseminated to each student passing the GED. This brochure should explain to GED graduates the successes of former GED graduates who have enrolled in community colleges and thus make them aware of the expanded educational opportunities available to them.

4. Community colleges should also make high school drop-outs aware of the GED testing program and the successes of GED graduates who have enrolled in community colleges. These high school drop-outs should be encouraged to enroll in GED preparation classes, pass the GED, and pursue a technical or vocational program at their local community college.

Recommendations for Further Study

To expand the results of this study and to broaden the understanding of GED graduates enrolled in two-year colleges the following recommendations are made for additional research:

1. This study should be replicated in the North Carolina Community College System with students enrolled in college transfer programs being the focus of the research since enrollment in this area is increasing at a faster rate than other areas. The study should be expanded with

a follow-up conducted to determine the number of GED graduates who transfer to four-year colleges and universities and to compare their academic success at the four-year school with traditional high school graduates who attended two-year colleges and transferred to the four-year school.

2. GED graduates who enroll at community colleges should be studied in relation to the support services they need and/or receive while enrolled. Support services would include but not be limited to counseling, advising, tutorial assistance, study skills training, library skills training, and vocabulary skills development.
3. A study should be conducted comparing GED graduates and traditional high school graduates that takes into consideration socioeconomic factors such as employment, income, ethnicity, marital status, number of children, transportation, academic preparation, etc.
4. A study should be conducted of graduates of vocational and technical programs from North Carolina community colleges. This study of community college graduates should compare GED graduates with traditional high school graduates in the workforce. Comparisons should be made in the number employed, number employed in a career related to their education, salary received, and potential for advancement within their career.

5. Research should be done to compare the success of GED graduates and traditional high school graduates enrolled in North Carolina community colleges using graduation from a technical or vocational program as the measure of success. Interactions of sex, age, length of time enrolled, and socioeconomic factors should be considered in determining success of the students.
6. A study should be conducted to define the reasons for GED graduates' low academic performance compared to traditional high school graduates when enrolled in vocational programs.

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APPENDIX A
ENROLLMENT INFORMATION



FALL

ENROLLMENT
REPORTING PERIOD

1987-88

NORTH CAROLINA
DEPARTMENT OF COMMUNITY COLLEGES
RALEIGH, NORTH CAROLINA

INSTITUTIONS	CURRICULUM PROGRAMS					EXTENSION PROGRAMS						TOTAL
	COLLEGE TRANSFER	GENERAL EDUC.	TECH- NICAL	VOCA- TIONAL	SUB- TOTAL	** ACA- DEMIC	*** OCCUPA- TIONAL	PRACT. SKILLS	AVOCA- TIONAL	**** RECREA- TIONAL	***** SUB- TOTAL	
MARTIN CC	143	24	375	211	753	580	419	35	57	0	1,069	1,822
MAYLAND CC	0	92	447	208	747	269	654	37	181	13	1,062	1,809
MCDOWELL TCC	0	57	151	91	299	316	231	4	144	0	656	955
MITCHELL CC	632	0	649	238	1,519	439	1,534	61	143	0	2,110	3,629
MONTGOMERY CC	0	24	235	286	545	247	383	23	174	0	792	1,337
NASH CC	55	29	1,206	246	1,536	714	1,302	10	65	0	2,079	3,615
PAMLICO CC	0	29	71	33	133	169	144	10	40	0	352	485
PIEDMONT CC	0	10	292	581	883	471	754	22	62	0	1,262	2,145
PITT CC	548	0	2,255	369	3,172	704	1,220	125	326	0	2,091	5,263
RANDOLPH CC	0	214	860	124	1,198	711	1,539	147	416	0	2,745	3,943
RICHMOND CC	60	20	616	206	902	1,066	1,167	38	145	0	2,164	3,066
ROANOKE-CHOWAN CC	0	86	405	185	676	553	291	185	351	0	1,273	1,949
ROBESON CC	0	68	858	319	1,245	1,055	1,473	10	118	0	2,622	3,867
ROCKINGHAM CC	557	7	696	265	1,525	560	935	67	276	0	1,794	3,319
ROWAN-CABARRUS CC	0	0	2,209	506	2,715	1,238	2,774	178	722	0	4,735	7,450
SAMPSON CC	0	194	529	116	839	394	920	186	325	0	1,673	2,512
SANDHILLS CC	767	14	971	162	1,914	1,006	1,719	197	437	0	3,195	5,109
SOUTHEASTERN CC	543	0	512	146	1,201	470	1,083	65	239	14	1,833	3,034
SOUTHWESTERN CC	0	192	880	129	1,201	203	725	43	186	6	1,116	2,317
STANLY CC	0	66	1,012	230	1,308	623	1,639	53	361	0	2,558	3,866
SURRY CC	1,105	0	1,144	308	2,557	751	855	48	318	0	1,814	4,371
TRI-COUNTY CC	240	0	326	176	742	155	621	146	179	0	1,073	1,815
VANCE-GRANVILLE CC	209	0	997	391	1,597	750	1,259	77	306	0	2,351	3,948
WAKE TCC	0	0	4,470	664	5,134	2,672	4,082	300	386	0	7,219	12,353
WAYNE CC	674	0	1,230	131	2,035	1,227	1,547	38	466	0	3,075	5,110
WESTERN PIEDMONT CC	729	10	1,104	317	2,160	1,206	1,275	92	319	20	2,580	4,740
WILKES CC	690	0	919	199	1,808	597	2,123	189	458	0	3,189	4,997
WILSON COUNTY TC	0	116	982	272	1,370	872	1,365	115	248	0	2,470	3,840
TOTAL 1987-88	18,800	8,318	77,951	18,458	123,527	49,803	81,085	8,085	20,909	123	152,909	276,436
TOTAL 1986-87	19,027	7,990	79,240	21,189	127,446	57,497	78,392	12,128	27,225	584	166,841	294,287
TOTAL 1985-86	19,325	8,817	79,325	21,451	128,918	55,490	78,249	13,222	29,209	257	167,538	296,456

** Includes Adult Basic Education (Grades 1 through 8), Adult High School Programs, Learning Laboratory, and other Academic Extension Programs.
 *** Includes Occupational Extension and New & Expanding Industry Programs.
 **** Includes Recreational Extension Programs and other Self-Supporting Classes.
 ***** Represents unduplicated headcount; will not necessarily be the sum of extension programs.

STUDENT REGISTRATION
NORTH CAROLINA COMMUNITY COLLEGE SYSTEM
FALL QUARTER 1987-88

INSTITUTIONS	CURRICULUM PROGRAMS					EXTENSION PROGRAMS					SUB-TOTAL	TOTAL
	COLLEGE TRANSFER	GENERAL EDUC.	TECH- NICAL	VOC- TIONAL	SUB- TOTAL	** ACA- DEMIC	*** OCCUPA- TIONAL	PRACT. SKILLS	AVOCA- TIONAL	**** RECREA- TIONAL		
ALAMANCE CC	0	0	2,639	491	3,130	1,267	1,996	260	567	0	3,776	6,906
ANSON CC	0	71	524	240	835	374	696	6	178	0	1,227	2,062
ASHEVILLE-BUNCOMBE TC	0	0	2,427	360	2,787	1,437	1,656	357	588	0	3,973	6,760
BEAUFORT COUNTY CC	257	3	689	279	1,228	419	839	75	318	0	1,485	2,713
BLADEN CC	0	96	164	254	514	285	513	56	112	12	897	1,411
BLUE RIDGE CC	0	149	704	415	1,268	774	1,376	141	382	0	2,557	3,825
BRUNSWICK CC	0	94	442	130	666	257	810	76	319	0	1,406	2,072
CALDWELL CC & TI	975	0	1,178	292	2,445	1,132	1,452	249	524	0	3,140	5,585
CAPE FEAR CC	0	308	1,788	301	2,397	686	1,604	159	295	0	2,685	5,082
CARTERET CC	0	260	870	319	1,449	402	1,140	24	123	0	1,665	3,114
CATAWBA VALLEY CC	0	125	2,075	324	2,524	942	1,694	313	908	0	3,627	6,151
CENTRAL CAROLINA CC	0	261	1,785	532	2,578	1,612	1,237	163	466	0	3,314	5,892
CENTRAL PIEDMONT CC	3,146	3,146	8,176	1,357	15,825	2,986	3,776	304	645	0	7,617	23,442
CLEVELAND CC	116	109	728	398	1,351	747	594	57	489	0	1,794	3,145
COASTAL CAROLINA CC	1,594	9	1,421	370	3,394	1,878	1,499	155	487	0	3,913	7,307
COLLEGE OF ALBEMARLE	866	18	401	217	1,502	613	910	162	259	0	1,921	3,423
CRAVEN CC	285	25	545	112	967	471	1,547	140	269	0	2,395	3,362
DAVIDSON COUNTY CC	605	0	1,253	335	2,193	798	1,659	147	276	26	2,837	5,030
DURHAM TCC	98	64	3,985	223	4,370	1,622	982	36	91	0	2,644	7,014
EDGECOMBE CC	115	44	884	174	1,217	673	637	202	239	0	1,486	2,703
FAYETTEVILLE TCC	0	1,048	4,148	857	6,053	2,023	7,312	542	1,159	0	10,807	16,860
FORSYTH TCC	0	32	3,421	364	3,817	1,339	2,316	379	1,526	32	5,401	9,218
GASTON COLLEGE	964	0	1,832	287	3,083	764	1,951	72	236	0	2,931	6,014
GUILFORD TCC	522	667	5,137	620	6,946	1,816	3,319	654	1,325	0	6,851	13,797
HALIFAX CC	210	0	488	248	946	506	1,038	92	69	0	1,678	2,624
HAYWOOD CC	0	136	650	278	1,064	402	402	33	98	0	880	1,944
ISOTHERMAL CC	1,248	1	720	258	2,227	839	663	323	797	0	2,303	4,530
JAMES SPRUNT CC	54	147	443	199	843	203	404	102	72	0	775	1,618
JOHNSTON CC	0	253	1,042	755	2,050	1,383	2,095	11	410	0	3,482	5,532
LENOIR CC	793	0	991	360	2,144	1,135	935	294	234	0	2,490	4,634

APPENDIX B
CORRESPONDENCE WITH COMMUNITY COLLEGES



2100 Silas Creek Parkway Winston-Salem, NC 27103 919-723-0371 FAX 919-761-2399
Dr. Bob H. Greene, President

Dear

I have been a Student Development professional for nearly twenty years working at College of The Albemarle, McDowell Technical Community College, and now at Forsyth Technical Community College. During this time I have questioned how GED graduates compared academically with traditional high school graduates enrolled in curriculums at our colleges. As a doctoral student I now have the opportunity to research this question in my dissertation.

Dr. Ed Wilson, Administrative Vice President for our system and Dr. Delane Boyer, Coordinator of GED programs have given me their full support in this study. However, I am working under a time limitation at UNC-Greensboro to complete my dissertation. Please respond to me as soon as possible if you can assist me with this research.

There are two ways I need your assistance. First, I need a letter from you stating your willingness to participate in the study and to provide the necessary data. My dissertation committee will not allow me to proceed further without this commitment from the selected colleges. Second, I will need the necessary student data to complete the research.

Enclosed are excerpt pages from my dissertation to give you insight into this study, how you were selected as a representative college, and the data required on your students. I hope you will be able to assist with the study. It will provide the community college system with valuable research in this area and will help me in my professional growth.

Please let me know as soon as possible if you can participate in the study. I will contact you later concerning the data collection. It is easily gathered from your PRIME data files. Please telephone me at 919-723-0371 (FTCC) if you have any questions or concerns. Thanks for your help.

Sincerely,

J. Bruce Shepherd
Director, Records and Recruitment



2100 Silas Creek Parkway Winston-Salem, NC 27103 919-723-0371 FAX 919-761-2399
Dr. Bob H. Greene, President

Dear

It was good to talk with you by phone. Thank you for your assistance with the research I am conducting concerning GED and traditional high school graduates.

I gave you the criteria for the study by phone but here is a brief summary in writing. If you have questions please call me at FTCC (919-723-0371).

The students to select are:

1. Students who enrolled for the first time Fall 1987
2. Students who have earned 12 or more credit hours
3. Students who are enrolled in a technical or vocational program leading to a degree or diploma

Please print a list of these students on plain white with the following information:

1. Cumulative grade point average
2. Sex
3. Birthdate
4. Total hours earned
5. Curriculum
6. GED or traditional high school graduate

Please do not include the students' names or college identification numbers.

Again, thanks for your help. I will share the results with you sometime in May.

Sincerely,

J. Bruce Shepherd
Director, Records and Recruitment



October 16, 1991

J. Bruce Shepherd
 Director of Records and Recruitment
 Forsyth Technical Community College
 2100 Silas Creek Parkway
 Winston Salem NC 27103

Dear Bruce:

I will be happy to provide the information you requested for your dissertation.

I should be able to furnish the data within a week of this date.

Please let me know if I can be of further assistance and good luck.

Sincerely,

Carol M Elmore
 Registrar



Telephone (919) 355-4200
Fax Number (919) 355-4401
Courier Number 01-45-28

October 31, 1991

Mr. Bruce Shepherd
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, N.C. 27103

Dear Bruce:

Thank you for including us in your research on GED and traditional high school graduates. Pitt Community College will gladly assist you in the collection of this data.

We are interested in the results of your study and hope you will share your results with us.

Sincerely,

A handwritten signature in cursive script, appearing to read "Kathy O. Kinlaw".

Kathy O. Kinlaw
Registrar

KK/pj



201 Highway 321 South, Dallas, NC 28034-1499, (704) 922-6200 FAX (704) 922-6440

November 1, 1991

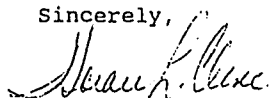
Mr. Bruce Sheppard
Director, Records & Recruitment
Forsythe Technical Community College
2100 Silas Creek Parkway
Winston-Salem, North Carolina 27103

Dear Mr. Sheppard:

We at Gaston College will be happy to cooperate with you in your dissertation research efforts. We would like to know the results of your study.

How GED graduates compare with traditional high school graduates will be valuable information for us and the whole community college system.

Sincerely,



Horace L. Cline
Dean of Students

HLC:ds

"An Educational Opportunity With Excellence"

ROANOKE-CHOWAN
COMMUNITY COLLEGE

Route 2, Box 46-A • Ahoskie, North Carolina 27910 • Telephone 919/332-5921

STUDENT DEVELOPMENT SERVICES

November 12, 1991

Mr. J. Bruce Shepherd, Director
Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Mr. Shepherd:

Please allow me to apologize for taking so long to respond to your letter of October 15.

As I told you in our telephone conversation, I am willing to participate in your study and provide necessary data from the PRIME computer on selected students.

I look forward to hearing from you in the near future.

Yours truly,

Bettie B. Hall

Bettie B. Hall, Dean
Student Development Services

"An Equal Opportunity Institution"



MONTGOMERY COMMUNITY COLLEGE

POST OFFICE BOX 787 • TROY, NC 27371 • TELEPHONE (919) 572-3691 • FAX (919) 576-2176

November 1, 1991

Mr. J. Bruce Shepherd
Director, Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

We, at Montgomery Community College, will be glad to participate and assist you in your study of GED graduates and how they compare academically with traditional high school graduates enrolled in curriculums at our colleges. All necessary data will be supplied.

This will provide useful information for us all.

Sincerely,

A handwritten signature in dark ink, appearing to read "Phil Kissell".

Phil Kissell, Dean
Student Development Services

PK/bh



Southeastern Community College

An equal opportunity affirmative action institution

October 24, 1991

Mr. J. Bruce Shepherd
Director, Records & Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

On behalf of myself and the Research Office staff, Southeastern Community College is willing to assist you with your study comparing GED graduates with traditional high school graduates. This willingness includes providing you with the necessary data, as described in the summary of the project which you sent me.

Best of luck, and I look forward to hearing from you soon!

Sincerely,

A handwritten signature in cursive script that reads "Julie M. Stocks".

Julie M. Stocks
Dean of Student Development Services

pp

**Western Piedmont Community College**

Dr. Jim A. Richardson
President

October 24, 1991

Mr. J. Bruce Shepherd
Director, Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

RE: Study of GED Graduates

Dear Bruce:

I will be glad to assist you in gathering information on GED and high school graduates who first enrolled at Western Piedmont during the 1987 Fall term. Please contact me regarding the format and medium for the transfer of this data.

Sincerely,

Jim W. Burnett
Associate Dean/Registrar

JWB/chr



October 24, 1991

J. Bruce Shepard
Director, Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

I received your letter of October 13, 1991 regarding Davidson County Community College's involvement in your dissertation research at UNC-Greensboro. On the basis of my review of your research proposal, DCCC agrees to assist you in the data collection process.

When you are ready to begin data collection through the Prime Network, please coordinate your efforts directly with me. I will involve Mr. Dale O'Bryant, Director, Administrative Computer Services, in the process. Please note that we will probably want to run your data selection program at DCCC in order to create a separate file that can then be transmitted to you via the network.

Please let me know if you have further questions regarding our participation in your study.

Sincerely,



Ed Morse
Vice President
Planning and Student Services

SS

P.O. Box 120 • College Drive • Wilkesboro, North Carolina 28697-0120 • 919/651-8600 • Fax 919/651-8749
A COMPREHENSIVE COLLEGE SERVING NORTHWEST NORTH CAROLINA



November 20, 1991

J. Bruce Shepherd
Director Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

Thank you for requesting that Wilkes Community College be a part of your study concerning GED student success. We will gladly provide the information you have requested.

We do not use the PRIME computer system but should still be able to provide the information you have requested. We will begin to collect this information right away and will forward it to you just as soon as winter quarter registration demands will allow.

We look forward to seeing the results of your study.

Sincerely,

Bob C. Thompson, Dean
of Student Development

lsm

Ashe County Center
Wilkes Community College
Mt. Jefferson Rd
P.O. Box 504
Jefferson, NC 28640
919/246-3900

Small Business Center
Wilkes Community College
207 Tenth Street
North Wilkesboro, NC 28659
919/651-8694

Alleghany County Center
Wilkes Community College
P.O. Box 220, Main Street
Sparta, NC 28675
919/372-5061

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CAPE FEAR
COMMUNITY
COLLEGE

411 NORTH FRONT STREET
WILMINGTON, NORTH CAROLINA 28401-3993 • PHONE (919) 343-0481 • FAX (919) 763-2279

October 30, 1991

Mr. J. Bruce Shepherd
Director, Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

I am writing in reference to my participation in the gathering
dissertation data for you.

I will be most happy to participate in your study.

Sincerely,

Carl E. Malpass
Dean of Student Affairs

dwb



McDOWELL TECHNICAL COMMUNITY COLLEGE

President Robert M. Baggs

July 19, 1991

Mr. Bruce Shepherd
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103-5197

Dear Bruce,

I received your request for McDowell Technical Community College to assist you with your doctorate dissertation. We will be happy to provide statistical information on our students which is pertinent to your study.

I wish you luck and will assist you in any way possible.

Sincerely,

A handwritten signature in cursive script that reads "Jim L. Bicklin".

Jim L. Bicklin
Dean of Students

To: Bruce Shepherd
From: Susan O. Phelps *S. Phelps*
Date: February 21, 1991.

SUBJECT: RESEARCH REQUEST

Attached you will find your approved research requests. They are approved with conditions set forth. The conditions are:

1. Research is not conducted for dissertations during regular work hours.
2. Minimal use is made of the college programmer, her staff, and the PRIME computer system for dissertation work. My suggestion is you acquire data through hard copy and go outside the institution for assistance with data manipulation and analysis.
3. Ms. Safarian, programmer, is to be paid for any time she spends in helping with research efforts for the dissertation work. It is her personal choice to assist you or not. She should be paid for her extra work above and beyond college official work.

I would like to add that the college is supportive of your gaining more expertise in order to better serve our students, and I encourage research that contributes to the knowledge base of the college. However, research requests will be considered on a one-by-one basis with benefit to the college as the main criteria of evaluation.

OS
Attachment

APPENDIX C
LETTERS OF SUPPORT



DEPARTMENT OF COMMUNITY COLLEGES

NORTH CAROLINA STATE BOARD OF COMMUNITY COLLEGES
200 W. JONES STREET
RALEIGH, NC 27603-1337

ROBERT W. SCOTT
System President

919-733-7051

October 16, 1991

Mr. Bruce Shepherd
Director
Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103

Dear Bruce:

It was good to talk with you at the computer conference in Asheville concerning your dissertation. I think your topic is excellent. With our state's emphasis on literacy, your research on GED graduates and how they compare academically with traditional high school graduates when they enroll in our system will provide very valuable information. I particularly like your method for selecting community colleges throughout the system. That will give you a good sampling of community colleges by size and geographic location.

You have the state department's full support and cooperation in your research. If you have difficulty gathering data, please let me know; or if there is data that the department can provide, please call me. You have permission to use the PRIME Networking to gather and transfer data necessary to accomplish your research.

I congratulate you personally for your educational accomplishment and commend you for your dissertation topic selection. Please provide my office with the results when you have completed research, and I will disseminate it to the appropriate persons at the state office. It will be very helpful to us as we serve the citizens of our state.

Sincerely,

A handwritten signature in dark ink, appearing to read "Edward H. Wilson, Jr.", written over a horizontal line.

Edward H. Wilson, Jr.
Executive Vice President

/w

**DEPARTMENT OF COMMUNITY COLLEGES**

NORTH CAROLINA STATE BOARD OF COMMUNITY COLLEGES

200 W. JONES STREET

RALEIGH, NC 27603-1337

ROBERT W. SCOTT
System President

919-733-7051

July 15, 1991

Mr. J. Bruce Shepherd
Director of Records and Recruitment
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27103-5197

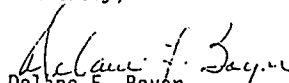
Dear Mr. Shepherd:

This letter is in response to support your research on the General Educational Development (GED) program offered by the community colleges in this state.

There is a need to continually, objectively evaluate the GED program in terms of comparing the performance of students graduating from the traditional high school program with GED graduates. One area of research that is of great interest to us is the performance of GED graduates in our community college vocational, technical and college transfer programs. Another area of research of interest is any significant improvement in a GED graduates employment and economic status. Also employer, from the private sector in North Carolina, satisfaction with the work performance of GED graduates is of great interest to us. GED graduates satisfaction with the GED program in terms of instruction they received, their employment status and self-esteem is also of interest to us.

If I can be of any assistance to you in your research, please feel free to call on me.

Sincerely,


Delane F. Boyer
State GED Administrator

DFB:jwm

THE GENERAL EDUCATIONAL DEVELOPMENT TESTING SERVICE
OF THE AMERICAN COUNCIL ON EDUCATION



The Center for Adult Learning and Educational Credentials

August 19, 1991

J. Bruce Shepherd
Forsyth Technical Community College
2100 Silas Creek Parkway
Winston-Salem, NC 27013

Dear Mr. Shepherd:

Your dissertation examining the progress of GED graduates in your community college and comparing their results with those of traditional high school graduates sounds very interesting. Although there are other studies looking at the success of GED Diploma holders in the Community College, these studies are very local in nature and need to be replicated in other places before any generalizations can be made. Some of these studies did not control adequately for the age of the student. We are pleased that you have taken this necessary step.

The staff of the GED Testing Service has discussed your topic. We consider it worthwhile and necessary research. We very much hope that on completion you will send us a copy of your dissertation which we can enter into our bibliography to share with others.

Good luck with your study. We will look forward to hearing from you in the near future.

Sincerely yours,

A handwritten signature in cursive script that reads "Jean H. Lowe".

Jean H. Lowe
Director