AN ANALYSIS OF SELECTED FACTORS RELATED TO THE ACADEMIC SUCCESS OF STUDENTS AT CHARLES STEWART MOTT COMMUNITY COLLEGE FALL 1984

BY

Anita Dacpano Daus

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Educational Administration

1985

ABSTRACT

AN ANALYSIS OF SELECTED FACTORS RELATED TO
THE ACADEMIC SUCCESS OF STUDENTS AT
CHARLES STEWART MOTT COMMUNITY COLLEGE FALL 1984

By

Anita Dacpano Daus

Basically, this study is an attempt to investigate relationships between selected factors (age, race, sex, credit load, type of program, residence, financial aid) and academic success as measured by grade point average and successful course completion.

Eleven thousand one hundred fifty-eight students who were enrolled in courses for credit in the fall 1984 semester at Charles Stewart Mott Community College, Flint were included in the study.

Data collected were recoded and a computer program was developed to match computer files. Finally, data were processed for computer statistical analyses using a version of the Statistical Package for Social Sciences (SPSSX).

Conclusions drawn from the findings concerning overall relationships are as follows:

Race, age, credit load, financial aid, residence, sex and type of program are statistically related with academic success based on course completion. In other words, each of the above characteristics is related to academic success but it does not show the strength of

the relationship. This conclusion is based on the Chi-square results which took into account only one variable at a time and course completion.

Age, race, credit load, financial aid, residence and sex, arranged in order of the magnitude of their effects, are statistically related to academic success based on grade point average. This conclusion is based on the Stepwise Multiple Regression, a more powerful tool, which tested for the effects of the variables on GPA taking into account the effects of the other independent variables. Considering the significant relationships between selected characteristics and grade point average, the student who is more likely to achieve academic success at C. S. Mott Community College is 25 years old or older, white, full-time student, receiving financial aid, resides outside the college district and is female.

Type of program is not significantly related to academic success based on GPA; thus, it has no significant effect on GPA. In other words, enrollment in vocational or non-vocational education at C. S. Mott Community College does not significantly affect the GPA.

DEDICATION

TO MY HUSBAND

CAYETANO

Who provided me with love and understanding.

ACKNOWLEDGEMENTS

It is with great pleasure to express my gratitude to the members of my Guidance Committee, Dr. Lawrence Alexander, Dr. Richard Featherstone and Dr. Kenneth Harding for their constructive suggestions. Grateful appreciation is extended to the Chairman of the Guidance Committee, Dr. Eldon Nonnamaker, who generously extended his support, time, interest and offered valuable suggestions.

Grateful acknowledgement is extended to Dr. Art Tabachneck whose wisdom helped resolve numerous crises.

Deepest appreciation is given to Jaclyn Hoffman, colleague and friend, who tactfully edited this work.

And finally, special recognition and gratitude are offered to my family who provided encouragement, sacrifices, understanding, and unfailing support throughout this memorable endeavor.

TABLE OF CONTENTS

Chapter Page

Chapter Page

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

THE PROBLEM

BACKGROUND AND NEED

Since the 1950's, the community college or junior college in the United States has risen dramatically in its degree of prominence in American higher education. "The rapid growth of the community college is the best witness to the faith which people have in the ability of the community college to maximize opportunities for higher education." (Monroe, 1972:17) It now operates in every state and enrolls half the students who begin college in America (Cohen, 1982). It is oriented to the needs of the community it serves. It adapts its offerings to the needs of its own students. Its growing commitment to offer its services to all persons is a major contribution of the community college (Jones, 1979) to American society.

Community colleges are identified as being extremely diverse in size, organization, function, administration, support, curriculum, faculty and student body (Medsker, 1960). They maintain open admissions, design programs for all types of students and make it easy for anyone to attend, thus they attract a cohort of people who might not otherwise participate in education beyond high school (Cohen and Brawer, 1982). Reynolds (1965) explained that the community colleges' close proximity to the homes of potential students and their non-selection admission policies result in a wide range of students.

The diversity of the community college students in their backgrounds, their course options and their majors has prompted many researchers to study students' characteristics in relation to their academic success; however, the findings revealed mixed results.

Jones (1979) found that demographic variables such as sex, marital status, race and age did not appear to discriminate among the successful, unsuccessful, and withdrawal groups of students enrolled in computer programming courses.

Age at Lehigh County Community College, was studied by Federico (1974) and found that the older the student the greater is the likelihood that he/she will be academically successful. Frerichs (1976) found this to be true, finding that students in the older age range achieved grade point averages higher than the younger subjects. Demas (1966) supported this when he demonstrated age to be of significance.

Silver (1975) in his study at North Greenville College, reported that students' academic success, as measured by persistence and higher rate of graduation, to be positively correlated with the awarding of financial aid. Astin (1975) and Russ (1973), defining persisters as those still enrolled or having graduated, are in support that the amount of grant support appeared to be a major factor in student persistence.

The relationship of sex and academic success has been investigated. Fitch (1966), Beagle (1970) and Bryant (1961) all found that female students earned a higher point average than did males.

Grade point average appears to be a consistent variable that has a positive correlation with student academic success. Pantages and Creedon (1978), reported that a student's high school record is the best predictor of college success and persistence. G.P.A.'s at the last college attended appear to be a good predictor of later success according to Holahan and Paul (1976). Keene (1968) found that persons having a high school grade point average below 2.Ø and a composite A.C.T. score below 15 were poor risks.

Emmeluth (1979) in his article "An Assessment of Selected Variables Affecting Success in Community College Introductory Biology", Research in Education-ERIC, stated that individual research investigators are interested in different variables, they ask different questions in different ways, they sample different populations, and they report their findings in a number of forms. Morgan (1952) had the same concern when he found that many studies of nonintellectual factors and achievement yielded inconsistent results:

> The lack of consistent results may be due, in part, to the variety of measuring instruments used and the different populations which have been tested, and the varying definitions used in establishing achiever and non achiever groups (1952:292).

It becomes increasingly important that community colleges continually search for improved methods of instructing a diversified student population. However, most colleges, as indicated by Deutrow and Houston (1981) and Astin (1975), know very little about their students in terms of achievement and withdrawals.

Because the success of a college is most certainly reflected by the academic success of its students, it becomes necessary, although

not sufficient, that quantifiable student characteristics be examined. The results of these analyses will provide insights to discern the complex dynamics of student academic success. It is within this framework that the need for this study is undertaken.

In addition to college administrators' and faculty's preponderous responsibilty for being knowledgeable about their students, enough change has been witnessed in recent years to warrant a need to reinvestigate factors influencing student academic success in community colleges.

Declining enrollment trends in higher education is a very notable change. Unlike the 1960's and 1970's when there was a phenomenal enrollment growth in many colleges and universities, the 1980's face a new perilous era of declining enrollment (Commission on the Future of Higher Education, 1984). Crossland (1980) projected more than 15 percent overall national decline in the 18 to 24 year old college age-population between 1980 and 1990, with the greatest decline in this age group in the Northeast and Midwest. The recent report to Governor Blanchard by the State of Michigan Commission on the Future of Higher Education indicated that "the baby boom that had fueled the system's successful expansion in the 1960's began to wane in the 1980's." (vi) The Commission estimated that demographic trends alone would reduce enrollments in the higher education system by at least 15 percent by the mid-1990's. Thus, the system faces a future of declining enrollment.

Along with a reduction of the 18-24 year old group, community colleges are noting a changing clientele. Hill (1980) predicted a

composition of student bodies with more minorities, older students and part-time students.

As community colleges move toward the '90s, a combination of changing conditions will coalesce to reshape the institutional mission, programs, academic policies, and the context of governance. These changing conditions include rapid advances in knowledge and technology, shifting job opportunities, demands for accountability from taxpayers and legislators, competition for tax resources, decreasing financial aid, and increased institutional regulatory burdens (Alfred, 1984; Hill, 1980). These developments would provide an altered institutional environment and a change in community college student composition.

The consistency with which research reports reveal student changes in certain characteristics, along with changing conditions in higher education, further suggests the fruitfulness of undertaking new studies to detemine which factors impact on student academic success.

THE PURPOSE OF THE STUDY

The purpose of this study is to investigate selected factors that influence academic success as measured by grade point average and successful completion of courses attempted among all students who attended Charles Stewart Mott Community College (Flint, Michigan) during the fall 1984 semester.

This study is designed to test the following null hypotheses:

1. There will be no significant relationships between key independent variables (sex, race, age, credit load, type of program, residence, financial aid) and grade point average.

2. There will be no significant relationships between key independent variables (sex, race, age, credit load, type of program, residence, financial aid) and course completion.

SIGNIFICANCE OF THE STUDY

No study aimed at providing a predictive device for student success has been undertaken with respect to Charles Stewart Mott Community College in the recent past. Thus, the significance of this study is to:

1. provide useful information to administrators, staff and faculty at Charles Stewart Mott Community College as they plan to meet the challenges which face the future of the institution.

2. indicate success or lack of success so that the resources of Charles Stewart Mott Community College can be more completely and appropriately used to improve the student's potential for success.

METHODOLOGY

All students enrolled at Charles Stewart Mott Community College in courses for credit, as of the State Aid date (September 14, 1984), were included in this study.

Data from the student data base were collected initially at the time each student was admitted to the college along with additional data collected at the time each student was registered.

Corresponding grade point average earned and courses attempted at the end of the fall 1984 semester complete the data investigated.

Criticisms and suggestions for data analysis were requested from a research consultant and appropriate revisions were made.

The data that were analyzed were processed by the Charles Stewart Mott Community College Prime 850 mini computer using a version of the Statistical Package for Social Sciences (SPSS).

Results were tabulated and analyzed.

ASSUMPTIONS OF THE STUDY

In investigating the hypotheses for the study, the following assumptions were made. If these assumptions were violated the findings of this study could be influenced.

1. The information that was provided by the student at the time of admission to the college is honest, complete, accurate and current.

2. The student registered was indeed the same student who attempted courses and who earned his or her grade point average at the end of the fall 1984 semester.

LIMITATIONS OF THE STUDY

The study was limited to one community college, Charles Stewart Mott Community College. The college serves a divergent population, which consists mostly of urban and suburban residents. The study was further limited to only one semester.

The study was limited to an analysis of student academic success based on successful course completion and on grade point average.

DEFINITION OF TERMS

The definitions of terms which follow are presented to aid in the interpretation and clarification of this study and to facilitate any future replications of this study that may be initiated.

ACADEMIC SUCCESS - Status of a student who successfully completes all courses attempted or whose grade point average is more than or equal to 2.Ø on a 4.Ø scale.

COMMUNITY COLLEGE - "A two-year institution of higher education, generally public, offering instruction adopted in content, level, and schedule to the needs of the community in which it is located. Offerings usually include a transfer curriculum, occupational curriculums, general education and adult education. (Handbook of Data and Definitions in Higher Education, 1972).

CREDIT LOAD - Number of credits attempted by student during the semester.

FULL-TIME STUDENT - Refers to student who was enrolled in 12 semester hours or more of college course work.

G.P.A. - Refers to Grade Point Average. The grade point average is determined by dividing the total grade points earned by the total number of semester hours, whether passed or failed. The numerical equivalents of letter grades for determining the G.P.A. are: A=4, B=3, C=2, D=1, and E=Ø. Grades of S, U, and N have no grade points.

M.C.C. - Refers to Charles Stewart Mott Community College.

OCCUPATIONAL PROGRAM - Refers to vocational education program as categorized by the Michigan State Department of Education.

PART-TIME STUDENT - Refers to student who was enrolled in less than 12 semester hours of college course work.

RESIDENCE - Place where student lives at the time of admission. It identifies whether the student resides within the college district boundaries as defined by the State or outside the college district boundaries.

SEMESTER - A 'semester' is, half of an academic year (Good 1945). In this study it is 16 weeks.

SUCCESSFUL COURSE COMPLETION - Courses completed with a letter grade if "A", "B"," "C", "D", "S", or "N".

OVERVIEW OF THE STUDY

This study is divided into five chapters. Chapter I includes background and need of the study, statement of purpose of the study, significance of the study, methodology, assumptions of the study, limitations of the study, definition of terms used in the study and overview of the study.

The investigator presents a review of the pertinent literature in Chapter II of this study.

Chapter III contains a detailed presentation of the methodology used in this study. Included in this presentation is information relating to: (1) setting, (2) student population, (3) collection of data and (4) statistical methods used.

The in-depth analysis of the data is found in Chapter IV.

Chapter V contains a presentation of a summary of the study, conclusions, educational implications and recommendations.

CHAPTER II

REVIEW OF LITERATURE

INTRODUCTION

As stated in Chapter I, the central purpose of this study is to investigate selected factors that influence academic success of the community college student. This chapter is intended to provide additional background material that is pertinent to the particular aspects of this study. That literature related to the historical background of the community college is presented first; whereas, literature related to the general characteristics of the community college student is contained in the following section. This section is then followed by literature related to grade point average and course completion as criteria of academic success. The last sections of this chapter are related to studies done on sex, age, race, credit load, type of program, residence, and financial aid as predictors of academic success.

LITERATURE RELATED TO THE HISTORICAL BACKGROUND OF THE COMMUNITY COLLEGE.

An historical background of the community college is presented first to provide the reader with a better perspective of the general setting upon which this study is done.

The evolution of the community college was traced by many authors in various ways. Some based their history using the growth in numbers of two-year institutions, others used the evolution of institutional missions as reflected in the name changes from junior college to community college or to junior-community college, while some others used chronological developments and trends from early beginnings to the present. A selected combination of the above ways of tracing the evolution of the community college is included in this chapter.

The community college is relatively young. It is uniquely American because it has American origins. It had its roots slightly more than a century ago. The first junior college reported was established in the latter part of the nineteenth century. By 1900, there were eight junior colleges, privately supported and operated, with an enrollment of about 100 (American Council on Education, 1967). The oldest publicly supported junior college, still in existence, was established in 1901 at Joliet, Illinois. In the 1930's, there were only 400 junior colleges. The growth initially was slow; however, the community college grew by leaps and bounds in the 1960's and in the 1970's with over 4 million enrollment as shown in Table 1. However, in the early 1980's, the number of colleges declined from a high of

1,235 in 1977 to 1,219 in 1982.

The course of development from an idea to the community college we know today was succinctly described by Thornton (1972) in four major stages:

> The first and longest lasted from 1850 to 1920. During that period the idea and the acceptable practice of the junior college, a separate institution offering the first two years of baccalaureate curriculums, were achieved. Next, the concepts of terminal and semi-professional education in the junior college gained widespread currency with the foundation of the American Association of Junior Colleges in 1920. By the end of World War II in 1945, the idea was an established part of the junior college concept. The changes in post-high school education brought by the war emphasized a third element of responsibility, service to the adults of the community, and so the period of 1945 has seen the development of the operative definition of the community junior college. During this period, the rapid growth in college enrollments emphasized once more the transfer function of the junior college and brought increasing recognition and importance of the institution as a part of the total system of higher education. Finally, the period since about 1965 has seen the beginning of a movement toward the full realization of the open-door concept, with the spread of colleges into the inner city and their emphasis on seeking ways to provide for all the educational needs of that community (1972:47).

TABLE 1
Enrollments in
All Community, Technical, and Junior Colleges
1962-1982

Year	Total Number of Colleges	Opening Fall Enrollment	Percentage Change from Previous Directory
1962	704	818,869	9.38
1963	694	927,534	13.27
1964	719	1,043,963	12.55
1965	771	1,292,573	23.81
1966	837	1,464,099	13.27
1967	912	1,671,440	14.16
1968	993	1,954,116	16.91
1969	1,038	2,186,272	11.88
1970	1,091	2,499,837	14.34
1971	1,111	2,680,762	7.24
1972	1,141	2,866,062	6.91
1973	1,165	3,144,643	9.72
1974	1,203	3,527,340	12.17
1975	1,230	4,069,279	15.36
1976	1,233	4,084,976	.39
1977	1,235	4,309,984	5.51
1978	1,234	4,304,058	-.14
1979	1,230	4,487,872	4.27
1980	1,231	4,825,931	7.53
1981	1,219	4,887,675	1.27
1982	1,219	4,964,379	1.57

Source: 1983 Community, Technical and Junior College Directory.

The birth of the public community college near the turn of the last century was attributed to several innovative educators of that period. Vaughn (1984) in his commentary as a result of his interviews with six renowned pathfinders (C. Colvert, J. Cosand, E. Gleazer, B. Johnson, S. Martorama and J. Wattenbearger) on the evolution of the community college reported:

> The six interviewees showed considerable agreement on which forces and individuals shaped the community college during its early years. They agreed that American democracy itself made universal higher education possible, ...that William Rainey Harper, as president of the University of Chicago, deserved a great deal of credit for advocating and assisting in the establishment of public junior colleges; and that the California legislation of 1907 and 1917 authorizing public junior colleges played a key role in shaping the community college. All agreed that the founding of AACJC in 1920 provided the forum for the evolving mission of the junior college. Finally, all agreed that Leonard V. Koos, and Walter Crosby Eells, through their writings, teaching, and work with AACJC, did much to shape the early mission of the junior college, especially the public junior college. (1984:25)

Other educators that helped germinate the idea of the junior college according to Medsker (1960) were university presidents, such as, Folwell of Minnesota and Tappan of Michigan.

The American junior college developed modestly with its early mission of providing curricula designed to provide traditional lower division offerings, a transfer function. It was not until 1920 that occupational programs were first introduced in the junior college as a result of the Smith-Hughes vocational education legislation passed that year and as a reaction to the pressing economic needs growing out of the Depression (Medsker and Tillery, 1971). The addition of college-level occupational curriculums to the lower-division offerings

brought an entirely new complexion to the junior college. However, this institution of post secondary education still had not achieved its full stature as a community college until the further addition of adult education and community services (Thornton, 1972).

Many articles were written in the 1930's that used the terms, "junior college" and "community college," interchangeably or in combination to indicate the two year post secondary institution. It was the Report of the President's Commission in the 1940's that put the phrase "community college" in the lead. Proposing the extension of free public education two years beyond high school as part of the American School system, the concept of the community college was fully and favorably recognized. (The Commission on Higher Education, 1947).

Cohen and Brawer (1982) indicated that shifts in institutional purpose have been dictated not by pronouncements of educational philosophers but by some external forces, such as: the exigencies of financing, the state-level coordination bodies, the availability of new media and the new student group. The most profound external force that had influenced the community college mission, however, was World War II (Vaughn, 1884; Thornton, 1972). The end of World War II influenced the expansion of the job market, particularly based in the broad area of industrial technology which required new training programs of varied intensity and scope. The GI Bill of Rights was passed which provided sums to eligible veterans to attend colleges of their choice, and the global aspect of a war recently fought on many fronts increased the interest for enlightened, comprehensive education (Medsker and Tillery, 1971).

Monroe (1972) attributed the beginning of the expansion of the public community college after 1945 to several favorable factors, such as: the burgeoning number of high school graduates clamoring for a college education; the existence of local communities which had both sufficient taxable wealth and population willing to support a community college; and, most important, a body of parents and citizens who aspired to have their children enjoy the fulfillment of a dream for a college education.

The infusion of massive amounts of federal dollars in the 1960's as a result of the passage of the National Defense Act of 1958, the Higher Education Act of 1963, the Vocational Education Act of 1965, the Higher Education Act of 1965 and the Vocational Education Act of 1968, established firmly the place of the community college in the U.S. higher education system. The Act that probably provided the most significant recognition by the federal government, however, was the Higher Education Act of 1968 which gave the President power to submit to Congress proposals for making available post secondary education to all who qualify and seek it (Monroe, 1972).

The Acts passed by the U.S. Congress combined with many pressures upon the community college for change, the advent of the effects of the birth rate boom and the "open door " policy of two-year institutions are seen as major forces that resulted in the phenomenal growth of the 1960's and the 1970's (Cross, 1973). Today, community colleges are found in each of the fifty states. Cohen and Brawer (1982:23) wrote in their book The American Community College: "Now community colleges are everywhere. There are systems with branches in

inner cities and rural districts and with programs in prisons and on military bases."

The open door policy provides equal educational opportunities to all persons. Higher education is no longer reserved for the elite as in the early part of the twentieth century. Today, equalitarianism and egalitarianism characterize the community college.

The upward growth of community colleges has been accompanied by an increase in the number of student enrollments (Table 1). As indicated earlier, there is a decline in the number of two-year institutions in the 1980's. It is expected that the 18 to 24-year-old population will decrease by 15 %, while the enrollment of students less than 25 years old is also expected to drop 15 percent. The resulting drop would be 1.1 million by 1990 (Frankel, 1982). However, this decrease is projected to be offset by the enrollment of students 25 years old and over (Figure 1). Cohen and Brawer (1982) reported that in fall 1980, community college enrollments were up by 7.7 percent, compared with 3.6 percent increase for the senior institutions. The report further went on to show that in 1981, a year when four-year colleges and universities barely held their own, community college enrollments increased by 3.2 percent. It is projected that the age distribution of college students in 1990 will be markedly different from the 1970's (Frankel, 1982). There appears to be a shifting trend in enrollment toward a changing student body.

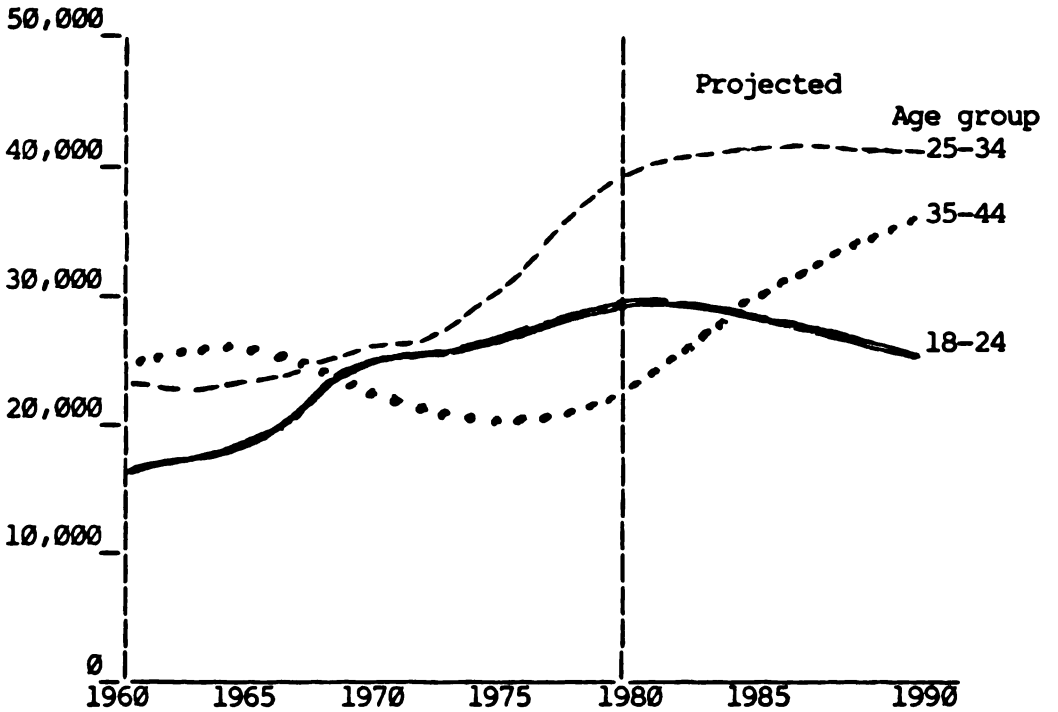


Figure 1
College-Age Population, By Age Group: 50 States and D.C.,
As of July 1, 1960 to 1990

Source: Projections of Education Statistics to 1990-1991.

In the 1980's the community college has secure roots and has become a well established part of American higher education. It has remained a two-year institution found nationally to be serving the educational needs of diversified clientele. The community college is here to stay.

LITERATURE RELATED TO THE GENERAL CHARACTERISTICS OF THE COMMUNITY COLLEGE STUDENT.

Who are the students? What are they like? What do some researchers say? Gleazer (1973) described community college students as "as different as night and day". Students comprise a broad spectrum of differences, he says, with striations of many kinds: motivations, age, culture, interests, academic achievement, objectives, race, socioeconomic backgrounds, aptitudes and intelligence. Landrith (1971) reports a wide age range from as young as 16 to as old as 70 years. Medsker (1960) citing Wise in her book The Junior College: Progress and Prospect, adds support to the community college students' diversity:

> College students today range from young to old, able to mediocre, idealistic to practical, naive to sophisticated, rich to poor; they are of all races, of all faiths--and of no faith. They are both full-time students and part-time students; they are both self-supporting and still dependent on their families. All these go to college, each for his own purpose. As the numbers of students continue to increase, so does the range of their individual differences (1960:30).

The open-door admission policy in two-year colleges is the most common reason given by authors (Thornton, 1972; Landrith, 1971; Borow and Hendrix, 1974) for this diversity. Cross (1973) states that the relatively unrestricted opportunity for entry results in a broad spectrum of academic abilities in the student population. Elaborating on the community college student diversity, Cross cited by Thornton (1972) had this to say:

> The array of talents and goals is great. There is the average student who is not quite sure he can make it at the university; there is the bright one who can't afford to leave home and a job to go away to college; there is the

> poor student who lacks even the basic learning skills but who recognizes the importance of preparing for a career; and there is the student from a minority group who sees the community college as a bridge to equal opportunities. There is the housewife who seeks cultural enrichment and the technologically obsolete family man who wants job retraining (1972:149).

Among other characteristics, the academic ability of the community college student has been an area studied by several researchers. Their findings showed varied results. Thornton (1972) showed that the average academic ability of the two-year college student is lower than that for the four-year college student. Medsker (1960) is in agreement. He states that only the less able students attend junior college and that it is a college of last resort for the student who cannot be admitted elsewhere.

Another investigator had a different finding. Cross (1970) reported that community colleges attract more students from the middle ranges of ability and fewer from the very low-or very high-ability students. This report seems to be a result of her observation that low-ability high school graduates do not continue their education and high ability graduates are more likely to enter four-year colleges. Landrith (1971) had another view. He found that in the junior college student body there are not only recent honor graduates who have qualifications for admission to a number of institutions but also recent graduates whose academic records are so poor they are considered high academic risks. In addition, he found that junior colleges enroll adults who were high school graduates and those who were high school drop-outs.

It appears that the average academic aptitude level of students entering two-year colleges is somewhat below that of those who enter four-year colleges. It seems more pragmatic to say that there is a wide range of abilities among two-year college students, and that many of them are superior in ability to many students in four-year institutions (Medsker, 1960).

This finding is supported by a study done by Leonard Koss as reported by Zwerling (1976). The results showed two overlapping bell curves that represent the distribution of scores of freshmen on the Thorndike College Aptitude Test administered at four junior colleges and three senior colleges. The curves reveal a lower mean score for the junior college student (61.2 as compared to 75.8 for the four-year college students). The overlap indicates that although the "average" two-year college student is not as bright as the "average" four-year student, many junior-college students are just as accomplished as many senior-college students.

Along with the historical metamorphoses of the community college is also a change in the character of the community college student. Just two decades ago, several investigators have noted that the national junior college male-female ratio was approximately 3:2 (Darley, 1959; U.S. Government Printing Office, 1962; Thurston, 1962; Blocker et al., 1965). As shown in Table 2, female students now outnumber men. Full-time men students continue to show the greatest decrease; while female students, both full- and part-time, indicate continued growth. For both men and women students, part-time students outnumber full-time students (Table 2). It is projected (Frankel,

1982) that there will be more older students enrolled in college. If the current trend continues, it is expected that the number of older students will increase by 1.1 million in 1990 and that they will constitute 47 percent of all college enrollment, compared with the 28 percent in 1970. This corresponds to the aging of the baby boom generation. The projection, however, shows that younger students will continue to outnumber older students. Frankel (1982) further reported that although the decline of younger students (less than 24 years old) would be compensated for in part by the increasing proportion of adults (24 years and older), it does not appear that adult undergraduates would make up the deficit completely.

Table 2
Enrollments in All Two-Year Colleges By Sex, Full-time and Part-time Status.

	Male		Female	
	Full-time	Part-time	Full-time	Part-time
1976	954,762	1,154,843	800,961	1,174,409
1977	889,141	1,240,504	837,012	1,343,339
1978	806,833	1,197,260	801,266	1,337,153
1979	801,720	1,267,580	826,916	1,473,433

Source: 1980 Community, Junior and Technical College Directory.

LITERATURE RELATED TO GRADE POINT AVERAGE AS A CRITERION OF ACADEMIC SUCCESS.

In this study, GPA is used as one of the criteria of academic success. A review of literature revealed that GPA is widely used both as a predictor (Frerichs, 1976; Edwards, 1977; Parsons, 1977; Silver, 1978; Yess, 1979; Clagett, 1982) and as a criterion of academic success (Chansky, 1964; Tatham, 1976; Martinko, 1978; Frerichs, 1981).

It would seem appropriate to include some of the studies which have used GPA as the criterion of academic success. Schroeder and Sledge (1966) found that the overall first term or first year grade point averages were used by the majority of approximately 60 of the more recent studies they reviewed first hand and of the more than 1000 studies they reviewed second hand. Reiter (1964) in his study of students enrolled in an introductory course also used the grade point average as the criterion of academic success.

The grade point average is a well established measure of academic success (Astin, 1971). It is a familiar dependent variable used in studies of academic achievement (Chansky, 1964). However, there is considerable disagreement about the specific factors being reflected in grades; about the comparability from one teacher within a discipline to another. Chansky (1964) in an article "A Note On the Grade Point Average in Research" for the Educational and Psychological Measurement Journal expressed the GPA's shortcomings: "The grade, the essential ingredient in GPA, has no stable meaning...Some inflate the value of the mark, others deflate it." (1964:95-99) Lavin (1965) points out that it is practically impossible to make comparisons from

teacher to teacher. They used different criteria in their grading systems. Additionally, he says, there are differences in curricular areas - some types of majors may be more difficult than others.

Although there are variations in grades or GPA, it appears that GPA is still of considerable value as an index of academic success. Astin (1971) states that GPA is the best indicator for academic achievement. It provides a single measure which summarizes all grade levels. There is ease in obtaining the data. Despite GPA's seeming lack of reliability, their measurement in quantifiable terms has gained their common acceptance as a criterion of academic success (Bryan, 1977).

LITERATURE RELATED TO COURSE COMPLETION AS A CRITERION OF ACADEMIC SUCCESS.

Successful course completion is the other criterion used in this study as a measure of academic success. Three studies that used course completion or program completion as a dependent variable of academic success are cited here.

Clagett (1980) used course completion or pass rate as an indicator of student success in his study of students at Prince George Community College, Maryland. He defined pass rate as successful completion with grades of A,B,C,D,TP,P and Audit. Students who either failed or withdrew were categorized as "not succeeding" (1980:3).

In 1974, Borow and Hendrix used occupational program completion as their indicator for student occupational achievement in their study of 24 colleges. In like manner, Tatham (1976) used program completion

as one of the criteria of academic success in her study of nursing and dental hygiene students at Johnson Community College, Kansas.

No controversial studies were found related to the reliability of course completion as an indicator of academic success.

The definition of academic success as proposed by the researcher throughout this paper is admittedly a very narrow definition. Hackman and Taber (1979) state this opinion about the concept of success in college:

> The meaning of "successful college performance" is elusive. Although students seek to achieve it and colleges profess to foster it, there is neither clarity nor agreement about what college success is. We began the present research with the premise that there are many different ways to succeed or fail in college, and that student performance is more complex than is implied by traditional admissions procedures and measures of student performance (1979:117).

In spite of the complexity of defining student academic success, the researcher has opted to use GPA or successful course completion as a measures of academic success.

INDEPENDENT VARIABLES.

Early research focused primarily on intellective and ability factors as predictors of academic success. Recently there have been important shifts in emphasis and in the conceptualization of the problem due to the gradual recognition that some students perform better and some perform worse than predicted by ability tests. The search for causes of this variation in academic performance led first to the consideration of "nonintellective" characteristics. Among the variables used as nonintellective predictors are sociological

determinants such as sex, age, race, financial aid, credit load, residence and program majors which are used as predictors in this study.

LITERATURE RELATED TO SEX AS A PREDICTOR OF ACADEMIC SUCCESS.

Lavin (1965) wrote in her book The Prediction of Academic Performance that sociological studies found ecological demographic characteristics to have an effect upon academic performance. He indicated: "The studies that assess the relation between sex and academic performance show that females have higher academic performance than males." (1965:129) In another study at San Joaquin City College, California, Reyes (1979) using sex as predictor to determine academic success found that the mean GPA of females is higher than the mean GPA of males. A related study conducted by Beagle (1970) on students enrolled in Ontario University also show a similar result - that the academic achievement of female adult students was significantly higher ($p < .01$) than that of the male adult students. Fitch, 1966; Spurlin, 1968; and Schroeder and Sledge, 1966) supported the same findings that women were superior to men in academic achievement.

Other researchers claim that there is no significant relationship between sex and academic success. In a study on the relationship between sex and academic success of freshmen enrolled in biology, Jenkins (1966) found no significant relationship. Sex is not a discriminant variable of academic success was reported by Frerichs (1981) in a paper he presented at the Annual Meeting of the American

Educational Research Association in Los Angeles, California. His conclusion was based on the result that sex did not produce an F value > 1. Jones (1979) gave the same conclusion that sex did not appear to discriminate among the successful, unsuccessful and withdrawal groups of programming students at J. Sargeant Reynolds Community College, Richmond, Virginia.

The literature reviewed appears to have inconsistent results in regard to sex as a predictor of academic success.

LITERATURE RELATED TO AGE AS A PREDICTOR OF ACADEMIC SUCCESS.

Age has received increased attention as a possible discriminator between academic success and academic failure. The literature reviewed revealed that there were more researchers who found that older students were more academically successful than were younger students.

Frerichs (1976) in her study of 712 younger and 723 older community college nursing students found that students in the older age range achieved GPA's approximately one GPA higher than the younger subjects (less than 23 years old). This was significant at $p < .01$ level. Sensor (1964) had a similar finding in her study of mature women during the Spring semester 1964 at Riverside City College, California. Her result showed that mature women, 25 years old or older, had a GPA 0.5 higher than that of the total student body. Kimes (1973) reported age as one of the variables that siginficantly differentiated successful and unsuccessful students enrolled in developmental mathematics at Eastfield College, Texas. Reyes (1979)

in his study to determine academic success using selected characteristics of 1972 and 1974 Associate of Arts graduates of San Jose City College, California used GPA as the criterion variable of academic success. As part of his findings he reported: "The quantitative variable found to be significantly related to grade point average was age. The mean age of successful graduates was twenty-seven." (1979:5)

In a paper Greer (1980) presented at the twentieth Annual Forum of the Association of Institutional Research in Atlanta, Georgia in 1980, she reported that her study was to determine the relative influence of selected student characteristics, one of which was age, on persistence and academic success; and to determine differences between non-traditional (25 years old and older) and traditional age entering students at Clayton Junior College, Georgia. Her conclusion included: "The older students who entered the regular academic program in the Fall 1976 were more successful academically than their younger counterparts.

Successful course completion was used as a dependent variable in a study done by Frerichs and Eldersveld (1981). Their purpose was to identify variables which could be used to discriminate between successful and unsuccessful students in developmental mathematics courses in eight Illinois community colleges. Subjects were successful if they earned a passing grade (A,B,C,D,S,P) within one and one-half terms of registration of the course. All others were classified as unsuccessful. Their sample included 513 subjects. Age was one of the potential discriminators. In using a discriminant

analysis, their results showed in part that the successful students, as a group, were nearly two years older than their unsuccessful counterparts. The mean age in the successful group was 23.57 and 21.39 was the mean age in the unsuccessful group with an F value of 7.52127.

At Middlesex County College, New Jersey, Capoor (1982) in her study of 540 stuudents who entered the nursing education program between 1979 and 1981 found that age had moderate though not consistent relationship with program performance. She reported:

> Overall, older students tended to perform better than younger students. For example, about 15% of those under 20 years old completed on an average less than 26% of the cumulative credits attempted by them, while this percentage for those between 21 and 24 years old was about 8% and for those older than 24 it was 4% only. (1982:4)

Two trends can be identified that may have advanced the average age of college students. One is the return of veterans from the Vietnam War. The second relates to the growing tendency for mature people who have missed all or part of college to matriculate later in life (Borow and Hendrix, 1974).

The literature reflects disagreement with respect to age as a predictor of academic success. Jones (1979) found that age did not discriminate among the successful, unsuccessful, and withdrawal groups of programming students at J. Sargeant Reynolds Community College, Virginia. Kray (1974) in his review of literature quoted Davis' (1962) finding that the older student had the lower completion rates, particularly if there were children. Schroeder and Sledge (1966) in their review of literature found that many studies using GPA as a

criterion of success revealed age to be negatively related. They speculated that the older student brings with him different, if not more, problems than the younger student. Parsons (1977) observed that the pressures of early adulthood have replaced those of late adolescence. Or, as Sheehy (1976) describes it, the student is "getting started" instead of "breaking away".

LITERATURE RELATED TO CREDIT LOAD AS A PREDICTOR OF ACADEMIC SUCCESS.

Recent literature is almost lacking on the relationship between credit load and academic success. However, there are related studies cited here. Lavin reported:

> Five studies find that academic load (number of courses carried) has little or no effect upon school performance. For low ability students, however, academic load is inversely related to grades. (1965:133)

In 1970, Beagle's result on her study of 172 undergraduate students showed that attendance as a part-time or full-time student appears to have no significant influence on academic performance. Among 142 male and female students who were registered for 16 or more credits at Minneapolis Community College in fall quarter 1979, Stein (1980) found that half of students completed essentially all the credits for which they were registered. (Stein defined completion as "A", "B", "C", "D", "P" grades). The literature also revealed two studies related to credit load; however, these were tied in with number of hours of employment. The study of Bryant (1961) at the Junior College of Kansas City, Missouri included 76 students working from 20 to 48 hours per week and carrying class loads in excess of ten

hours for the first semester 1960-61. He reported that the study gave inconclusive results. The Deal (1973) study cited by Parsons (1977) showed that students carrying 12-15 credit hours and working forty or more hours per week did better than those carrying the same load but working only 29-39 hours per week. Statistical significance was not included. Parsons' (1977) own result from his study of the relationship between the success of associate degree students, as measured by their grade point average, and their employment status, found no significant difference in the grade point average of full-time students working a designated number of hours per week attempting 12-15 credit hours and full-time students working a designated number of hours per week attempting 16 or more credit hours.

LITERATURE RELATED TO TYPE OF PROGRAMS AS A PREDICTOR OF ACADEMIC SUCCESS.

Hardly any studies were found in the literature that dealt with the relationship between type of programs and academic success. A closely related study done by Reyes (1979), mentioned earlier, showed that the general transfer graduate students outnumbered the vocational-technical students and achieved a slightly higher but not significantly greater GPA.

Another study was done by Schroeder and Sledge (1966). Their longitudinal study investigated the relationship between selected background factors and academic success of 181 male high school graduates of 1957 from five Wisconsin counties who attended college for a minimum of one year. Part of their findings showed that high

school GPA's in language, pure science, mathematics, social science and in all other courses correlated significantly and positively with college language, pure science, and overall grade point average, but not with college technical and agricultural grade points. Two high school academic factors (GPA's in pure science and social sciences) correlated significantly and positively with college technical average.

The scarcity of studies published in the literature in this area could perhaps be explained with the observation of Borow and Hendrix (1974):

> Dependable data on the choice-of-curriculum variable are not commonly available in the junior colleges. One problem is that many institutions categorize all students into either the occupational or transfer curriculum group, making no allowance in the classification for those students who are undecided. Moreover, the superficiality of these categories (occupational vs. transfer) makes them suspect, since the final decision as to the the transferability of school subjects rests with the institution which must finally accept and evaluate the course credits.

LITERATURE RELATED TO RACE AS A PREDICTOR OF ACADEMIC SUCCESS.

In the literature reviewed, studies that used race as a criterion of academic success have inconsistent results.

A study that revealed race as a discriminator of academic success is found in the study of Clagett in 1980. His data revealed that Blacks have 63% pass rate, Asian/Hispanics/Native Americans 71% pass rate whereas Whites have 75% pass rates. These data show that minority students have lower pass rates than the nonminority students. However, in the article "Community College Retention Research" Clagett wrote in 1982, his review of literature showed that ethnicity had no

significant relationship when academic background was controlled for. Jones (1979) and Reyes (1979) have similar findings that race did not appear to discriminate between the successful and unsuccessful students.

LITERATURE RELATED TO FINANCIAL AID AS A PREDICTOR OF ACADEMIC SUCCESS.

The review of literature indicated considerable dichotomy in the findings concerning the impact of financial aid on a student's academic success. In a comparative study of certain factors in 100 students with and 100 students without financial aid at Austin College, Texas done by Winder (1972) revealed that there was no advantage in receiving financial aid as far as grade point averages were concerned. Over the question of academic success as measured by course completion, Silver (1975) citing Wenc pointed out that the wisdom of giving greater amounts of aid to students did not appear to be the answer since over half of all freshmen receiving financial aid dropped out of education entirely. Nelson (1976) has another view. He said that fewer junior college students would drop out or fall short of their educational objectives if their financial needs were carefully assessed and met.

Several investigators maintained that financial aid is an affirmative determinant in the achievement of academic success. Gold (1970) in his study of financial aid recipients at Los Angeles City College indicated that his aid-receiving subjects were generally above the all-college average on measures of academic success, which he

defined as less students on academic probation and higher grade point average. In a review of Dissertation Abstracts International, Parker (1975), although his subjects were at an urban public university, reflects agreement of the forementioned finding. In studying the effect of financial assistance and counseling on the educational progress of minority students, he found that minority students at Chicago University, Illinois received higher GPA's.

Silver's (1975) study substantiates the consistency with which financial aid evidently affects the academic success of students. The purpose of his study was to determine the relationship between varying amounts of state and federal aid to a select group of students at North Greenville College, South Carolina between August, 1975 and May, 1977 and their academic success as measured by GPA's and their chances of earning an associate degree in four semesters. A minimum of 2.0 GPA was required for graduation. His findings include 77.9 percent of the students who graduated at the end of three or four semesters had received some aid as compared to 22.1 percent of the graduating students who received no aid. The report goes on to say that there appeared to be a positive correlation between the awarding of financial aid to his subjects and their academic success. The most effective aid recipients were those receiving between $1000 to $1999. Awards of more than $4000, however, did not positively affect GPA's or graduation rates.

LITERATURE RELATED TO RESIDENCE AS A PREDICTOR OF ACADEMIC SUCCESS.

No recent published literature was found that used residence as a predictor of academic success.

SUMMARY.

The two-year collegiate institution was initially called the junior college and for many years thereafter was known by that name. It is widely known today as community or community junior college reflecting its mission to serve the educational needs of the community where it is located.

The community junior college is a practical result of many interacting factors. To many Americans, it has become the means to equal opportunity. It has become the answer to many Americans to the concept of equal opportunity. It is an accepted part of the American higher education system. The growth was initially slow but phenomenal growth was seen in the 1960's and 1970's. In the 1980's, we see a period of decline or stabilization.

The enrollment trend shows a contraction of the traditional college-age student. The decline, however, is beginning to be offset by the older student; although, it does not appear that the adult undergraduate would make up the deficit completely. In the 1980's there are slightly more women than men students, more part-time than full-time students. There is certainly a shift toward a changing clientele.

The community college students have varied and diverse backgrounds. The open door admissions policy seems to be the major factor that resulted in the student body diversity.

Several researchers have studied the community college student. In many of these studies, grade point average or course completion was used as a measure of student academic success.

The literature further revealed studies that used nonintellective factors, such as: sex, age, race, credit load, type of program, financial aid as predictors of academic success. The findings showed that the predictability of academic success of students was not uniform in the different colleges studied.

CHAPTER III

DESIGN OF THE STUDY

INTRODUCTION

This chapter includes a description of the setting for the study, a description of the population, a description of the data collection process, a restatement of the hypothesis, a statement of the statistical analysis employed and summary.

SETTING

Charles Stewart Mott Community College, serving the Flint-Genesee County community, is located in the heart of downtown Flint. It opened its doors in 1923 to 114 students in the single curriculum it offered, classical liberal arts. Each year since 1975, it serves more than 10,000 students with transfer curriculums and with more than 80 different occupational and technical programs. A majority of courses for credit are offered on campus and some are offered at a number of extension centers located in secondary schools throughout the area the college serves. Additionally, the college offers continuing programs on vocational, avocational and recreational classes on a non-credit basis at many convenient locations within the college district (Appendix A). In the past academic year, 15,000 individuals were enrolled in continuing programs making a total of more than 25,000 persons directly served by Mott Community College.

MCC has evolved throughout its more than 60 years' history. Initially it was called Flint Junior College and was changed to Flint Community Junior College in 1960 in keeping with its changing mission. In 1969, it was renamed Genesee Community College to reflect the expansion of the college district. In 1973 the present name was adopted following the death of Charles Stewart Mott, a nationally known industrialist-philantropist and a three term mayor of Flint.

MCC is a public institution governed by an elected seven member Board of Trustees since July 1, 1970. Before this date, the governance was provided for by the Flint Board of Education.

In April 1983, the Board of Trustees officially approved the mission of the college. The mission reflects the college's obligation to meet the educational needs of the community it serves:

> The purpose of Mott Community College is to provide a variety of learning opportunities for adults, regardless of age or background, in Genesee County and the surrounding areas. Serving all who desire to identify and develop their abilities and interests, the college seeks to eliminate barriers to education and to enhance both individual growth and community development.
>
> Mott Community College accomplishes this purpose, both on campus and in the community, by providing college transfer courses, other general education courses, technical and vocational training, developmental education, continuing education and diverse community services, as well as those vital support services such as guidance and counseling, library and other learning resources, financial aid, job placement, and others which augment the educational offerings. (Self-Study Report: 1985)

C. S. Mott Community College, like other community colleges, is an "open door" institution. It must admit any high school graduate and any other person over nineteen years of age who is capable of profiting from the instruction offered. In effect, the college is

expected to admit all applicants without regard to ability or any other aspect of background.

POPULATION

The population used for analyses included all Charles Stewart Mott Community College students who were registered, as of the State Aid date (September 14, 1984), in courses for credit during the fall 1984 semester. Students who withdrew before the State Aid date were not included in this study because records of the courses they were enrolled in were not kept. This population was chosen for the following reasons:

1. Admission data, registration data, and financial aid data were readily available for this population or can be readily obtained when necessary.
2. The grade point average and courses attempted were readily available for each student.
3. The population is large enough to provide a statistically reliable data base.
4. The population is the most recent population that could be used for this study.

DATA COLLECTION PROCESS

The demographic data were collected in the Admission's Office, Mott Community College at the time student was admitted. These data included name, social security number (used as student number), home address, birth date, sex, race, and type of programs. Credit load information was collected at the Registrar's Office at the time of registration. Financial Aid information was collected at the Financial Aid Office. Class standing was determined when the credit load for

the fall semester was added to the existing credit load earned by the student. All data were entered into the computer at the respective offices.

The Registrar's Office collected final grades submitted on "mark sense" grade forms and were read with the use of an optical scanner. Data were saved in computer files.

A computer program was developed so that appropriate computer analyses could be accomplished. Independent variables were given value labels in the following manner:

Sex

1 Male
Ø Female

Race

1 White
Ø Nonwhite

Age

1 < 25 years
Ø => 25 years

Credit load

1 => 12 credits
Ø < 12 credits

Program

1 Vocational
Ø Non-vocational

Residence

1 In district
Ø Out of district

Financial Aid

1 Recipients of financial aid
Ø Non-recipients of financial aid

Data were sorted by student numbers and computer files from the Admissions Office, Financial Aid Office and Registrar's Office were matched. Finally, the data were processed for statistical analyses by the MCC Prime 850 mini computer using a version of the Statistical Package for Social Sciences (SPSSX).

STATEMENT OF HYPOTHESES

In order to examine whether selected variables have any statistically significant relationship on academic success, as measured by grade point average and course completion, the following null hypotheses were tested in this study.

Hypothesis 1:

There is no significant relationship between key independent variables and course completion.

Hypothesis 1 A:

There is no significant relationship between sex and course completion.

Hypothesis 1 B:

There is no significant relationship between race and course completion.

Hypothesis 1 C:

There is no significant relationship between age and course completion.

Hypothesis 1 D:

There is no significant relationship between credit load and course completion.

Hypothesis 1 E:

There is no significant relationship between type of program and course completion.

Hypothesis 1 F:

There is no significant relationship between residence and course completion.

Hypothesis 1 G:

There is no significant relationship between financial aid and course completion.

Hypothesis 2:

There are no significant relationships between key independent variables (sex, race, age, credit load, type of program, residence, financial aid) and grade point average.

STATISTICAL ANALYSIS

Hypothesis 1 and subhypotheses, which dealt with selected independent variables and course completion were tested using the Chi-square test for independence. (All variables are discrete variables.) This test is used to determine if there is a relationship between discrete dependent and independent variables. This test, however, does not tell the strength of the relationship.

Hypothesis 2 which dealt with selected independent variables and grade point average were tested using the Stepwise Multiple Regression, a variation of Multiple Regression, to determine a combination of independent variables which gives the highest possible

measure of association with grade point average. (GPA is a continuous variable).

Stepwise Multiple Regression is an efficient statistical procedure which provides the researcher with a powerful tool for choosing independent variables that will determine an equation for the best possible prediction of the dependent variable with the least number of independent variables.

The procedure was concisely described by Cerullo (1982: 74) in the following manner:

> The independent variable is found which explains the most variance in the dependent variable. In other words, the best predictor variable is found. The second variable is added to the equation by choosing the best predictor given that first variable is already in the equation. Variables are added in this manner, step by step, until the desired number of variables are entered into the equation, or until no additional variables are significant in explaining the variance in the dependent variable (i.e. they do not add to the equation's ability to predict the value of the dependent variable). At each step the optimum variable is selected, given the other variables already selected. Before a variable is added to the regression equation, the size of the normalized coefficient is tested to determine if it will make a significant contribution to the equation. If it will not contribute significantly, it is not added to the equation. Since all other variables not yet added will contribute even less, the process is terminated at this point.

The output of the SPSS Stepwise Multiple Regression includes a statistical summary of the total prediction equation. This includes multiple R, R square, B and Beta. In this study Multiple R measures the correlation between actual grade point average of students and the grade point average which are predicted on the basis of the independent variables. In this sense, R is a measure of the overall adequacy of the independent variables in accounting for the outcome.

R square measures the proportion of variation in GPA which is explained by knowing all the independent variables in the equation. To put it another way, it is the fraction of the variable in the dependent variable explained by the regression equation. B is the actual effect of each independent variable on GPA knowing the other independent variables in the equation. Beta is the standardized effect of each independent variable on GPA knowing the other independent variables in the equation.

SUMMARY

The setting of this study was at C.S. Mott Community College located in the heart of downtown Flint. It is a public institution with a mission to meet the educational needs of the community it serves.

The population was composed of students enrolled for credit courses in fall 1984 semester. This population was selected because data about the population were current and readily accessible. Additionally, the size was large enough to provide statistically reliable results.

The data which were entered in computer files were collected from three areas of the college - Admission's Office, Registrar's Office and Financial Aid Office. The computer files were then recoded and matched so that the data could be processed through the MCC Prime 850 mini computer with the use of a version of SPSSX.

The null hypotheses were restated and subhypotheses were developed which deal with the relationships between selected variables

and academic success based on course completion and grade point average.

The Chi-square test was employed with discrete independent and dependent variables and a Stepwise Multiple Regression was used to test for discrete independent variables and a continuous dependent variable.

These statistical procedures were determined with the aid of the Office of Research Consultation at Michigan State University.

CHAPTER IV

ANALYSIS OF THE DATA

INTRODUCTION

The purpose of this study was to investigate selected factors that influence academic success as measured by grade point average and successful completion of courses attempted. The population included all students who were registered, as of the State Aid date, in courses for credit during the fall 1984 semester at Charles Stewart Mott Community College. The student data base needed for this study was obtained from the Admissions Office. Registrar's Office and Financial Aid Office.

Two main hypotheses were formulated: (1) to determine the relationship, if any, between key independent variables (sex, race, age, credit load, type of program, residence, financial aid) and course completion and (2) to determine the relationship, if any, between the above independent variables and grade point average.

The Chi-square test for independence was used for the first hypothesis and Stepwise Multiple Regression was used for the second hypothesis.

The data were processed for statistical analysis by the C. S. Mott Community College Prime 850 mini computer using a version of the Statistical Package for Social Sciences (SPSSX).

This chapter is concerned with the analysis of data studied.

PRESENTATION OF DATA

The study produced a number of significant findings. The null hypotheses and the results of the hypotheses tests are presented below.

Hypothesis 1 A:

There is no significant relationship between sex and course completion.

Of the 11,158 students who were registered, 59.6 per cent were women and 40.4 per cent were men. Of the 6,649 women, 79.26 per cent were successful and of the 4,509 men 77.64 per cent were successful. Although the percentage difference between successful men and women is small, it is statistically significant because of the large size of the sample. The Chi-square at 1 degree freedom was 4.073 and was significant at $P < 0.05$. The null hypothesis, therefore, was rejected (see Table 3).

Table 3. Data on Sex and Course Completion

		Sex		
	Count	Female	Male	Row Total
Course Completion	Not Successful	1,379	1,008	2,387 21.4
	Successful	5,270	3,501	8,771 78.6
	Column Total	6,649 59.6	4,509 40.4	11,158 100.0

Chi-Square = 4.07360, D. F. = 1, Significance = 0.0436

Hypothesis 1 B:

There is no significant relationship between race and course completion.

Of the 11,158 students who were registered 21.1 per cent were nonwhite students and 78.9 per cent were white students. Of the 2,350 nonwhites, 71.19 per cent were successful and of the 7,098 whites 80.58 per cent were successful. The percentage difference between successful nonwhites and whites is quite large which is almost 10 per cent and is statistically significant. The Chi-square at 1 degree freedom was 96.798 and was significant at $P < 0.01$ level. The null hypothesis was, therefore, rejected (see Table 4).

Table 4. Data on Race and Course Completion

		Race		
	Count	NonWhite	White	Row Total
Course Completion	Not Successful	677	1,710	2,387 21.4
	Successful	1,673	7,098	8,771
	Column Total	2,350 21.1	8,808 78.9	11,158 100.0

Chi-Square = 96.79815, D. F. = 1, Significance = 0.0000

Hypothesis 1 C:

There is no significant relationship between age and course completion.

Of the 11,158 students who were registered 50.7 per cent were 25 years or older and 49.3 per cent were less than 25 years old. Of the 5,662 students who were 25 years old or older, 83.96 per cent were successful and of the 5,496 students who were less than 25 years old 73.08 per cent were successful. The percentage difference between the two age groups is large which is almost 11 per cent and is statistically significant. The Chi-square at 1 degree freedom was 195.44 and was significant at $P < 0.01$ level. The null hypothesis was, therefore, rejected (see Table 5).

Table 5. Data on Age and Course Completion

		Age		
	Count	>=25 years	< 25 years	Row Total
Course Completion	Not Successful	908	1,479	2,387 21.4
	Successful	4,754	4,017	8,771 78.6
	Column Total	5,662 50.7	5,496 49.3	11,158 100.0

Chi-Square = 195.44581, D. F. = 1, Significance = 0.0000

Hypothesis 1 D:

There is no significant relationship between residence and course completion.

Of the 11,158 students who were registered, 10.2 per cent were residing outside the college district and 89.8 per cent were residing within the college district. Of the 1,228 students residing outside the college district, 79.15 per cent were successful and of the 10,030 students residing within the college district 77.75 per cent were successful. The percentage difference between the successful out of district residents and in-district residents is very small, however, it is statistically significant because of the large size of the sample. The Chi-square at 1 degree freedom was 33.827 and was significant at $P < 0.01$ level. The null hypothesis was rejected (see Table 6).

Table 6. Data on Residence and Course Completion

		Residence		
	Count	Out of District	In District	Row Total
Course Completion	Not Successful	156	2,231	2,387 21.4
	Successful	972	7,799	8,771 78.6
	Column Total	1,228 10.2	10,030 89.8	11,158 100.0

Chi-Square = 33.82700, D. F. = 1, Significance = 0.0000

Hypothesis 1 E:

There is no significant relationship between credit load attempted and course completion.

Of the 11,158 students who were registered, 82.2 per cent were part time students and 17.8 per cent were full-time students. Of the 9,177 part-time students, 81.36 per cent were successful and of the 1,981 full-time students 65.82 per cent were successful. The percentage difference between the successful part-time and full-time students is very large and is statistically significant. The difference is almost 16 per cent. The Chi-square at 1 degree freedom was 243.379 and was significant at $P < 0.01$ level. The null hypothesis was rejected (see Table 7).

Table 7. Data on Credit Load and Course Completion

		Credit Load		
	Count	Part-time	Full-time	Row Total
Course Completion	Not Successful	1,710	677	2,387 21.4
	Successful	7,467	1,304	8,771 78.6
	Column Total	9,177 82.2	1,981 17.8	11,158 100.0

Chi-Square = 243.37928, D. F. = 1, Significance = 0.0000

Hypothesis 1 F:

There is no significant relationship between type of program and course completion.

Of the 11,158 students who were registered, 37.7 per cent were in non-vocational programs and 62.3 per cent were in vocational programs. Of the 4,204 students enrolled in non-vocational education, 76.56 per cent were successful and of the 6,954 students enrolled in vocational education 79.83 per cent were successful. The percentage difference between the two successful groups of students is only 3 per cent which is very small, however, it is statistically significant because of the large sample size. The Chi-square at 1 degree freedom was 16.456 and was significant at $P < 0.0001$ level. The null hypothesis was rejected (see table 8).

Table 8. Data on Type of Program and Course Completion

		Program		
	Count	Non-Voc-ed	Voc-ed	Row Total
Course	Not Successful	985	1,402	2,387 21.4
Completion	Successful	3,219	5,552	8,771
	Column Total	4,204 37.7	6,954 62.3	11,158 100.0

Chi-Square = 16.45617, D. F. = 1, Significance = 0.0001

Hypothesis 1 G:

There is no significant relationship between financial aid and course completion.

Of the 11,158 students who were registered, 64.9 per cent were non-recipients of financial aid and 35.1 per cent were recipients of financial aid. Of the 7,237 non-recipients of financial aid, 79.38 per cent were successful and of the 3,921 recipients of financial aid 77.17 per cent were successful. The percentage difference between the successful non-recipients and recipients of financial aid is only about 2 per cent, however, it is statistically significant because of the large size of the sample. The Chi-square at 1 degree freedom was 55.279 and was significant at $P < 0.00$ level. The null hypothesis was rejected (see Table 9).

Table 9. Data on Financial and Course Completion

Financial Aid

	Count	Non-Recipients	Recipients	Row Total
Course Completion	Not Successful	1,492	895	2,387 21.4
	Successful	5,745	3,026	8,771 78.6
	Column Total	7,237 64.9	3,921 35.1	11,158 100.0

Chi-Square = 55.27981, D. F. = 1, Significance = 0.0000

A summary of statistics on academic success based on course completion is shown in Figure 2.

COMPARISON BETWEEN INCIDENCE OF SUCCESS AND NON-SUCCESS USING COURSE COMPLETION AND GPA.

Although the data on Table 10 is not part of the statistical analysis essential to this study, the information is included here to serve as a point of interest to the reader.

Of the 11,158 students who were registered, 78.6 per cent were successful and 21.4 per cent were unsuccessful when course completion was used as the dependent variable. There were 68.4 per cent successful students and 31.6 per cent unsuccessful students when grade point average was used as the dependent variable (see Table 10).

Statistics on the successful students based on course completion at C. S. Mott Community College in fall 1984 semester were:

1. 79.26% females (Total number of females = 6,649).
2. 77.64% males (Total number of males = 4,509).
3. 71.19% non-whites (Total number of non-whites = 2,350).
4. 80.58% whites (Total number of whites = 7,098).
5. 83.96% 25 years old or older (Total number of 25 year old or older = 5,662).
6. 73.08% less than 25 years old (Total no of < 25 years = 5,496).
7. 79.15% residents outside the college district (Total number of residents outside the college district = 1,228).
8. 77.75% residents within the college district (Total number of residents within the college district = 10,030).
9. 81.36% part-time students (Total number of part-time = 9,177).
10. 65.82% full-time students (Total number of full-time = 1,981).
11. 76.56% enrolled in Non-Vocational education (Total number in Non-Voc ed = 4,204).
12. 79.83% enrolled in Vocational ed (Total number in Voc ed = 6,594).
13. 79.38% non-recipients of financial aid (Total number of recipients = 7,237).
14. 77.17% recipients of financial aid (Total number of recipients = 3,921.

Figure 2. Statistics on Successful Students Based on Course Completion.

Table 10. Data on Incidence of Success and Non-Success Using Course Completion and GPA

	Course Completion	GPA
Not Successful	2,387 (21.4)	3,529 (31.6)
Successful	8,771 (78.6)	7,629 (68.4)
Column Total	11,158	11,158

Hypothesis 2:

There is no significant relationships between key independent variables (sex, race, age, credit load, type of program, residence, financial aid) and grade point average.

The first independent variable entered on step one by the computer program was race. The following were the results: Multiple R 0.15116, R Square 0.02285, B 0.52766, Beta 0.015116. The F value was 259.916 and significant at alpha at 0.00 level.

As was explained in Chapter III, in this study Multiple R measures the correlation between actual grade point average of students and the grade point average which are predicted on the basis of the independent variables. In this sense, R is a measure of the overall adequacy of the independent variables accounting for the outcome - GPA. R square measures the proportion of variation in GPA which is explained by knowing all the independent variables in the equation. It is the fraction of the independent variable in the

dependent variable explained by the regression equation. B is the actual effect of each independent variable on GPA knowing the other independent variables in the equation. Beta is the standardized effect of each independent variable on GPA knowing the other independent variables in the equation.

(The reader is cautioned to disregard the negative signs of the numbers; these are absolute values.)

Age was the next independent variable selected by the computer program for step two. The following were the results. Multiple R 0.21221, R Square .04503, B -.41565, B -.14894. The F value was 262.061 and significant at alpha 0.00 level. The B and Beta of race have changed (see Table 11). The B or the actual effect of race on GPA when age was introduced in the equation was reduced from 52.7% to 51.8%.

Table 11. B and Beta of Race and Age

	B	Beta
Race	.51835	.15136
Age	-.41565	-.14894

On step three, credit load was the independent variable entered by the computer program with the following results: Multiple R 0.22495, R Square 0.05060, B 0.27745, Beta 0.07604. The F value was 197.449 and significant at alpha 0.00 level. The B and Beta of

race and age have changed (see Table 12). With the introduction of credit load in the equation, the actual effect of race and age on GPA were increased from the actual effects in Step 2.

Table 12. B and Beta of Race, Age and Credit Load

	B	Beta
Race	.52182	.15237
Age	-.45624	-.16349
Credit Load	.27745	.07604

The fourth independent variable entered on step four by the computer was financial aid. The following were the results: Multiple R 0.23828, R Square 0.05678, B -.24858, Beta 0.09414. The F value was 167.235 and significant at alpha 0.00 level. (See Table 13 for changed B and Beta of race, age and credit load). Financial aid, when introduced in the equation reduced the B of race, but increased the B of age and credit when the values are compared with values in Step 3.

Table 13. B and Beta of Race, Age, Credit Load and Financial Aid

	B	Beta
Race	.47373	.13833
Age	-.48557	-.17400
Credit Load	.34351	.09414
Financial Aid	-.24858	-.08213

Residence was the next independent variable added by the computer program for the fifth step. The following were the results: Multiple R .24201, R Square 0.05857, B -.19738, Beta -.08219. The F value was 138.262 and significant at alpha 0.00 level. The B and Beta of race, age, credit load and financial aid have changed (see Table 14). The actual effects of race, age, and credit load on GPA were further reduced with the introduction of residence in the equation.

Table 14. B and Beta of Race, Age, Credit Load, Financial Aid, and Residence

	B	Beta
Race	.45814	.13378
Age	-.47878	-.17156
Credit Load	.34272	.09393
Financial Aid	-.24876	-.08219
Residence	-.19738	-.04265

On step six, sex was the independent variable added by the computer. Results shown are the following: Multiple R Ø.24566, R Square Ø.ØØ6Ø34, B -.12165 and Beta -.Ø4278. The F value was 118.93Ø and was significant at alpha Ø.ØØ level. (See Table 15 for changed B and Beta of race, age, credit load, financial aid and residence). Step six was the last step in the procedure; thus, the B and Beta of the independent variables are the final actual effects of these variables on GPA. As shown in Table 15 age with 46.8% had the most actual effect on GPA, followed by race with 45.7% effect, then credit load with 34.5% effect, financial aid with 26.7% effect and followed by residence and sex with each contributing less than 20% of the effect on GPA.

Table 15. B Beta and Confidence Intervals of Race, Age, Credit Load, Financial Aid, Residence, and Sex

	B	95% Confidence Intervals of B		Beta
Race	.45706	.39399	.52013	.13346
Age	-.46897	-.52091	-.41703	-.16805
Credit Load	.34570	.27698	.41442	.09474
Financial Aid	-.26718	-.32474	-.20962	-.08828
Residence	-.19879	-.28283	-.11475	-.04295
Sex	-.12165	-.17366	-.06964	-.04278

The computer program did not add the seventh independent variable, type of program, because it did not contribute significantly to the equation. The null hypothesis, therefore, is rejected except for the variable, type of program.

As shown in Table 15, the variable that has the most significant actual effect on GPA is age. It has a negative sign for B. Since the recode option of REGRESSION made 1 = < 25 years old and Ø = 25 years or older, the coefficient is interpreted to mean that, in general, the students who are 25 years or older did better than students who are less than 25 years old. The next variable that has the most significant actual effect on GPA is race. The values were coded 1 = whites and Ø = nonwhites. The positive sign indicates that whites did generally better than nonwhites. Values for the third variable credit load were 1 = full-time students (12 credits or more) and Ø = part-time students (< 12 credits). The positive sign shows that full-time students did generally better than part-time students. The fourth variable financial aid were coded 1 = recipients of financial aid and Ø = non-recipients of financial aid. The negative sign of the coefficient illustrates that non-recipients of financial aid did generally better than recipients of financial aid. Residence was the fifth variable added to the equation and was coded 1 = residents within the college district and Ø = residents outside the college district. The negative sign indicates that the residents outside the college district have generally a higher GPA than those students residing within the college district. The last variable added to the

equation was sex and was coded 1 = males and Ø = females. The negative sign shows that female students did generally better than male students. (See Figure 3 for profile of students based on GPA as criterion of academic success.)

Profile of students enrolled at C. S. Mott Community College in fall 1984 semester (N = 11,158) based on GPA as criterion of academic success.
1. In general, students who were 25 years old or older did better than students who were younger than 25 years old.
2. In general, white students did better than nonwhite students.
3. In general, full-time (12 credits or more) students did better than part-time (<12 credits) students.
4. In general, non-recipients of financial aid did better than recipients of financial aid.
5. In general, residents outside the college district did better than residents within the college district.
6. In general, females did better than males.

Figure 3. Profile of Students in Fall 1984 Semester Based on GPA as Criterion of Academic Success.

Table 16 presents a summary of independent variables, their multiple R's, R squares and F values from Step 1 through Step 6. Multiple R measured only about 25% of the correlation between the actual GPA of students and the GPA which are predicted on the basis of the independent variables race, age, credit load, financial aid, residence and sex. In other words, R measured about 25% of the overall adequacy of the above independent variables in accounting for GPA. In looking at the R square, only 6 per cent variation in the criterion variable GPA is explained by the six independent variables taken together in this model. Although this variation is small, the test is statistically significant because of the large size of the sample.

Table 16. Summary of Independent Variables, their Multiple R's, R Squares, F Values and Levels of Significance

Variable	Step	Multiple R	R Square	F	SigF
Race	1	.1512	.0228	259.917	.000
Age	2	.2122	.0450	262.062	.000
Credit Load	3	.2249	.0506	197.450	.000
Fin. Aid	4	.2383	.0568	167.236	.000
Residence	5	.2420	.0586	138.263	.000
Sex	6	.2457	.0603	118.930	.000

Using the Stepwise Multiple Regression, six out of the seven variables tested that seem to contribute the most to the prediction of grade point average for students enrolled at C. S. Mott Community College in fall 1984 semester, in order of their importance, are as follows:

Age

Race

Credit load

Financial aid

Residence

Sex

The confidence intervals of B are shown in Table 15. With 95 percent confidence B is not equal to Ø. In other words, H_o was rejected because the lower and upper limits of the confidence intervals of B of each of the variables--race, age, credit load, financial aid, residence, and sex did not include Ø at alpha = Ø.Ø5.

Additional statistics about the MCC student in fall 1984 semester are shown in Figure 4. This information may be of interest to the reader.

The statistics on the students enrolled at C. S. Mott Community College in fall 1984 semester (N = 11,158) were:

1. 59.6% were female, 40.4% were male.
2. 78.9% were white, 21.1% were minority.
3. 50.7% were 25 years old or older, 49.3% were less than 25 years old.
4. 80.8% were residing within the college district, 10.2% were residing outside the college district.
5. 37.7% were enrolled in non-vocational programs, 62.3% were enrolled in vocational programs.
6. 82.2% were part-time, were 17.8% full-time.
7. 64.9% were non-recipients of financial aid, 35.1% were recipients of financial aid.
8. 78.6% were successful, 21.4% were unsuccessful based on satisfactory course completion.
9. 68.4% were successful, 31.6% were not successful based on GPA.
10. Mean GPA was 2.2421.

Figure 4. Statistics on Students in Fall 1984 Semester.

SUMMARY

This chapter provided an in depth analysis of the data used in this study. Each hypothesis was presented followed by pertinent data. After each discussion a table relating to the data discussed, was presented. Each table summarized the key points of the data. Hypotheses that were rejected or not rejected were indicated. Statistics on academically successful students based on course completion and grade point average were presented in Figures 2 and 3.

CHAPTER V

SUMMARY; DISCUSSION AND CONCLUSIONS; RECOMMENDATIONS AND EDUCATIONAL IMPLICATIONS

INTRODUCTION

Chapter V is divided into three main sections: summary; discussion and conclusions; and recommendations and educational implications.

SUMMARY

This study investigated seven selected characteristics that influence academic success as separately measured by course completion and grade point average.

The population included all students enrolled at C.S. Mott Community College in the fall 1984 semester in courses for credit as of the State Aid date (September 14, 1984).

The data were collected and entered in the computer at the Admission's Office for demographic data, at the Registrar's Office for courses attempted and earned and at the Financial Aid Office for financial aid data.

Hypothesis 1 and subhypotheses which involved the relationships between seven key independent variables and course completion were tested using the Chi-square test for independence. Hypothesis 2 which involved the relationships between the same seven independent

variables used in hypothesis 1 and grade point average was tested using the Stepwise Multiple Regression.

The literature reviewed contained articles mostly from refereed journals and from highly technical books pertinent to this study and post secondary education. The section included historical background of the community college, general characteristics of the community college student, and literature related to the dependent and independent variables used in this study.

Analysis of the data revealed that there is a significant relationship between sex, age, race, credit load, type of program, residence, financial aid and course completion. The data further revealed that six out of the seven variables tested in order of their importance: age, race, credit load, financial aid, residence and sex contributed significantly to the prediction of grade point average. Type of program was found not to be significantly related to academic success as measured by GPA.

DISCUSSION AND CONCLUSIONS

It seems logical to assume that the subjects involved in this study (11,158) were quite representative of most students who would be attending C.S. Mott Community College. This assumption seems particularly justified since the population in Flint and surrounding areas from which the college draws its students has begun to stabilize. The researcher believes, therefore, that the following conclusions drawn from the findings of this study can be generally

applied to future students of C.S. Mott Community College, if similar definitions are assumed.

Conclusions drawn from the findings concerning overall relationships are as follows:

Race, age, credit load, financial aid, residence, sex and type of program are statistically related with academic success based on course completion. In other words, each of the above characteristics is related to academic success but it does not show the strength of the relationships. This conclusion is based on the Chi-square results which took into account only one variable at a time and course completion--criterion of academic success.

Age, race, credit load, financial aid, residence and sex, arranged in order of the magnitude of their effects, are statistically related to academic success based on grade point average. This conclusion is based on the Stepwise Multiple Regression, a more powerful tool, which tested for the effects of the variables on GPA taking into account the effects of the other independent variables. Considering the significant relationships between selected characteristics and grade point average, the student who is most likely to achieve academic success at C.S. Mott Community College is 25 years old or older, white, full-time student, not receiving financial aid, resides outside the college district and is female.

The student who is at least 25 years old is more likely to have a higher GPA than the younger student. This perhaps could be explained by the fact that older students are more highly motivated (Medsker and Tillery, 1971) and more certain in their educational goals than the

traditional age students (Greer, 1980). Additionally, the older student has had more time to plan his/her education within the framework of his/her responsibilities.

The white student is more likely to have a higher GPA than the non-white. There may be some other variables not included in this study that contributes to the academic success of the white student such as higher socioeconomic background, better educated parents or have attended a better high school than the non-white student.

The full-time student is more likely to have a higher GPA than the part-time student. The full-time student may be more organized and more committed to his/her educational goals than the part-time student, who, as suggested by Knoell (1976) only has partial commitment to college and readily withdraws when employment or some other activity proves more attractive.

The non-recipient of financial aid is more likely to have a higher GPA than the recipient of financial aid. Again, there may be some confounding variables that may have contributed to the finding. It may be that the financially disadvantaged student may also be disadvantaged in some other ways. This is <u>not</u> to say that financial aid has a negative effect on academic success.

The student who resides outside the college district is more likely to have a higher GPA than the student who resides within the college district. The explanation that could be given is that generally, the student who resides outside the college district travels further distances and because of this and that he/she pays

higher tuition, he/she may be more motivated than the student residing within the boundaries of the college district.

The female student is more likely to have a higher GPA than the male student. The surprising thing about this conclusion is that, among the other independent variables, it had contributed the least effect in the statistical significance on GPA since most of the studies reviewed shown that females are more significantly academically better than males. The female student may have become the head of a single-parent family who seeks and needs new skills through education to improve her socioeconomic status and thus, is more motivated than the male student.

Type of program is not significantly related to academic success based on GPA, thus, it has no significant effect on GPA. In other words, enrollment in vocational or non-vocational education at C.S. Mott Community College does not significantly affect the GPA.

Since only 6 per cent variation is explained by age, race, credit load, financial aid, residence and sex on GPA, this indicates that although the variation is significant, the variation is small. It may be that the students are more alike or more homogeneous. It is likely that they have the same or similar backgrounds. It is difficult to ascertain the reason(s) as pre-measurement data on intellectual factors such as ACT or SAT are not a requirement for admission. As indicated earlier, MCC, like other public institutions, has an open door admission policy.

RECOMMENDATIONS AND EDUCATIONAL IMPLICATIONS

On the basis of the conclusions drawn, the researcher feels it reasonable to make the following educational implications and recommendations:

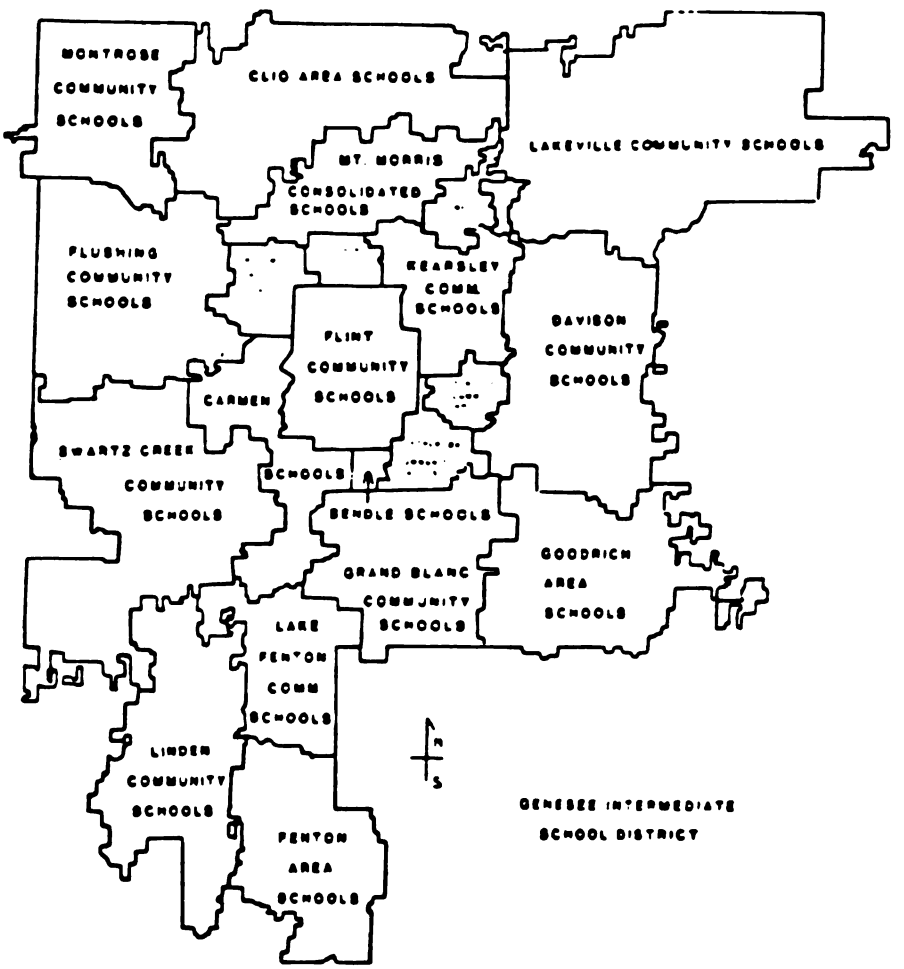
1. Further explorations should be made into the non-intellectual domain such as socioeconomic background; marital status; interest and motivation; attitudes, beliefs and values; and family size and structure of students in order to discover factors which might improve prediction of academic success.
2. Additional research should be conducted to determine why male, non-white, less than 25 years old, part-time student, recipient of financial aid and who resides within the college district is the student least likely to achieve academic success based on successful course completion.
3. Further investigations should be conducted in an effort to ascertain why females did better than males, whites better than non-whites, 25 year old or older students better than those who are less than 25 years old, non-recipients of financial aid better than recipients, full-time students better than part-time, and students residing outside the college district better than students residing within the college district.
4. Type of program enrolled in should not be used as a predictor of academic success based on grade point average.

5. A study complementing this investigation should be conducted to determine academic success of students in each academic division for an entire academic year.
6. A valuable related study might investigate the role of the guidance and counseling division with respect to the final academic outcome of MCC students.
7. Intellective factors such as rank in high school, ACT and SAT should be gathered by MCC, not as an Admission's requirement, but as part of student data base to be used for research to improve the likelihood of predicting which variables promote academic success.

These studies, if conducted, would build a framework for future decisions by administrators and faculty at C.S. Mott Community College, Flint, Michigan.

APPENDIX A

CHARLES STEWART MOTT COMMUNITY COLLEGE DISTRICT



BIBLIOGRAPHY

BIBLIOGRAPHY

Alfred, Richard L. "Paradox for Community College: Education in the '80s." Community College Review. Summer 1984, 12, 2-5.

-------.An Introduction to American Junior Colleges, published by American Council on Education, Washington, D.C., 1967.

Astin, Alexander W. Predicting Academic Performance in College: Selectivity Data for 23 of American Colleges. New York: Free Press, 1971.

Astin, Alexander W. Preventing Students From Dropping Out. San Francisco: Jossey-Bass, 1975, 19-32.

Beagle, Peggy. "Factors Affecting Academic Achievement of Students Enrolled in Ontario University Credit Courses." Research in Education-ERIC, ED 054-408, 1970.

Blocker, C.E., Plummer, R.H., and Richardson, R.C. The Two-Year College: A Social Synthesis. New Jersey: Prentice-Hall, Inc., 1965.

Boron, Henry and Hendrix, Vernon L. "Environmental Differentials of Occupational Programs and Educational Career Patterns in Public Jr. Colleges." Research in Education-ERIC, ED 105-910, November 1974.

Bryan, Edward M. "An Analysis of the Relationship Between Academic Achievement and Five Dimensions of Satisfaction with the College Environment." Unpublished doctoral dissertation, Michigan State University, 1977.

Bryant, Girard T. "Here's How They Work." Junior College Journal, 1961, 32, 205-206.

Capoor, Madan. "An Evaluative Study of the Nurse Education Program. Research Report Number 82-1, Middlesex County College, Edison, New Jersey, Office of Research and Planning, September 1982.

Cerullo, Richard E. "Predicting Student Success in College Using Stepwise Multiple Regression." Unpublished doctoral dissertation, West Virginia University, 1982.

Chansky, Norman M. "A Note on the Grade Point Average in Research." Educational and Psychological Measurement. 24, 1964, 95-99.

Clagett, Craig A. "Course Completion Ratio for Fall 1979: Impact on Student Retention," Research in Education-ERIC, ED 188-680, March 1980.

Clagett, Craig A. "Community College Retention Research." Prince George Community College, Largo, Maryland, Research in Education-ERIC, ED 225-604, 1982.

Cohen, Arthur M. and Brawer, Florence B. The American Community College, San Francisco: Jossey-Bass, Inc. 1982.

Cohen, Arthur M. and Brawer, Florence B. "The Community Cllege as College." Change 14, March 1982, 39-42.

--------.The Commission on Higher Education George F. Zook, chairman, Report "Higher Education for American Democracy," 1947, V-2, p. 7.

Cross, Patricia K. "The Impact of Changing Student Populations on Community Colleges," Community College Review. 10, Spring 83, 30-34.

Cross, K.P. "The New Learners." Change, 1973 5, 31-34.

Cross, K. Patricia, "Occupationally Oriented Students." Junior College Research Review, 5, November, 1970.

Crossland, Fred E. "Learning to Cope With a Downward Slope," Paper delivered at the Annual Meeting of the Association of Independent Colleges and Universities, Worchester, Mass., May 8, 1980.

Darley, J.G. "Factors Associated with College Careers in Minnesota," Unpublished manuscript Center for the Study of Higher Education, Berkeley, Carlifornia, 1959.

Davis, James A. Stipends and Spouses. Chicago: University of Chicago Press, 1962.

Demas, G.J. Selected Factors that can be Useful in Assisting in the Prediction of Success in Introductory College Biology and Chemistry Courses offered in Community Colleges. Unpublished doctoral dissertation, University of Virginia, 1966.

Duthrow, Anita M. and Houstin, Charles A. "An Analysis of the Relationships of Academic Success and Selected Achievement/Attitude Tests." Paper presented at the Annual Meeting of the Southeastern Association for Community College Research (Orlando, Florida, July 20-22, 1981).

Edwards, R.R. "The Prediction of Success in Remedial Mathematics Courses in the Public Community Junior College. The Journal of Educational Research, 1977, 66, 157-160.

Emmeluth, Donald S. "An Assessment of Selected Variables Affecting Success in Community College Introductory Biology." Research in Education-ERIC, ED 174-298, 1979.

Federico, Joseph J.; Shoemaker, Bette. "Summary of a Study to Determine the Factors that Influence a Student's Ability to Transfer Successfully from Lehigh County (Pennsylvania) Community College. Research in Education-ERIC, ED 097-042, 1974.

Fatch, Naomi. "The Employed Student and His Achievement Level at San Joaquin Delta Junior College." Research in Education-ERIC, ED 011-771, 1966.

Frankel, Martin M. and Gerald, Debra E. Projections of Education Statistics to 1990-91. National Center for Education Statistics. Washington, D.C. Vol I: Methodological Report, 1982, p. 10-28.

Frankel, Martin M. and Gerald, Debra E. Projections of Education Statistics to 1990-91. National Center for Education Statistics Washington, D.C. Vol: Methodological Report, 1982, p. 9-17.

Frericks, Allen H. and Eldersveld, Paul J. "Predicting Successful and Unsuccessful Developmental Mathematics Students in Community Colleges." Paper presented at the Annauul Meeting of the American Educational Research Association. (Los Angeles, Ca, April 13-17, 1981). Research in Education-ERIC, ED 202-507, 1981.

Frericks, Marian . "Relationship of Age, Marital Status and Work Experience of Community College Nursing Students to Grades." Research in Education-ERIC, ED 112-986, 1976.

Gilbert, Fontelle Editor. 1980 Community, Junior, and Technical College Directory. 1980, p. 2.

Gleazer, Edmund, Jr. Project Focus: A Forecast Study of Community Colleges. New York: McGraw-Hill Book Company, 1973.

Gold, Benjamin K. "Academic Performance of Financial Aid Recipients." Los Angeles City College, California, December 1970, 1-7.

Good, C.V. Dictionary of Education. New York: McGraw-Hill Book company, Inc., 1945, 366.

Greer, Linda R. "Persistence and Academic Success Among Non-Traditional Age Students at a Junior College." Paper presented at the Annual Forum of the Association of institutional Research (20th, Atlanta, Georgia, April 27-May 1, 1980). Research in Education-ERIC, ED 189-942, 1980.

Handbook of Data and Definitions in Higher Education. A Serivce of the Joint Commission on$Data and Definitions in Higher Education sponsored by the American Association of Collegiate Registrars and Admissions officers, 1972.

Hart, MaryRose L. "An Analysis of the Characteristics of the Returning/nonreturning Older Adult Student A Community College Setting." Unpublished doctoral dissertation, MSU, 1977.

Hill, Warren G. Executive Director, "Challenge: Coordination and Governance in the 80s. A Report on Issues and Directions in Statewide Coordination and Governance of Post Secondary Education in the 1980s." Report No. 134, Colorado, July 1980, 1-29.

Jenkins, A.C. "The Relationship of Certain Measurable Factors to Academic Success in Freshman Biology." Unpublished doctoral dissertation, New York University , 1966.

Jones, Jerry L. "Predicting Success of Programming Students, J. Sargcaht Reynolds Community College." Richmond, Virginia, Research in Education-ERIC, ED 178-151, November, 1979.

Keene, James W. "A Follow-Up Study of the Registered Nursing Program." (Cuupertino, California: Research in Education-ERIC, ED 022-432, May 29, 1968.

Kemis, B.A. "A Comparison of Selected Characteristics of Developmental Mathematics Students of Eastfield College." Unpublished doctoral dissertation, East Texas State University, 1973.

Knoell, D. Through the Open Door: A Study of Patterns of Enrollment and Performance in California's Community Colleges. Sacramento, Ca: Report No. 76-1 Post Secondary Education Commission, 1976.

Kray, Eugene. "The Develpment of an Activity Index: An Analysis of Hours Worked and Credit Hours Carried by Full-Time Students of Delaware County Community College." Research in Education-ERIC, ED 097-079, Fort Lauderdale, Fla. July 1974.

Landrith, Harold F. Introduction to the Community Junior College. Danvile, Illinois: The Interstate Printers and Publishers, Inc., 1971.

Lavin, David E. The Prediction of Academic Performance. New York: Russell Sage Foundation, 1965.

Magarell, Jack. "Despite Drop in Number of 18-Year-Olds, College Rolls could Rise During the 1980's." The Chronicle of Higher Education, April 21, 1980, X 20 p. 1 & 11.

Martinko, Agnes. "Success of Transfer Students' in Pennsylvania," Research in Education-ERIC, ED 165-849, Harrisburg, October 1978.

Medsker, Leland L. The Junior College: Progress and Prospect. New York: McGraw-Hill Book Company, 1960, 70.

Medsker, Leland L. and Tillery, Dale. Breaking the access Barriers: A Profile of Two-Year colleges, Sponsored by The Carnegie Commission on Higher Education, New York: McGraw-Hill Book Company, 1971.

Medsker, Leland L. and Tillery, Dale. Breaking the Access Barriers - A Profile of Two-Year Colleges. New York: McGraw-Hill Book Company, 1971.

Monroe, Charles R. Profile of the Community College, San Francisco: Jossey-Bass Inc., 1972.

Morgan, Henry H. "A Psychometric Comparison of Achieving and Non-achieving College Students of High Ability." Journal of Consulting Psychology, 1952, 16, 292-298.

McMaster, Anne. "Course Completion Rates, Volume and Efficiency Measures, and Grade Distribution." Mercer County Community College, Trenton, New Jersey, September 1983.

Pantages, T.J. and Creedin, C.F. "Studies of College Attrition: 1950-1975." Review of Educational Research, 1978, 48, 49-101.

Parker, Stephen A. "The Effect of Financial Assistance and Counseling on the Educational Progress of Minority Students in an Urban Public University." Dissertation Abstracts International, May, 1975, 7067.

Parnell, Dale (President, AACJC). 1983 Community, Technical, and Junior College Directory, Washington, D.C., 1983, p. 18.

Parsons, Ralph. "The Effect of Employment on the Grades of Students in Associate Degree Programs at Forsyth Technical Institute, Research in Education-ERIC, ED 140-911, April 1977, 15.

Plisko, Valena W. The Condition of Education. National Center for Education Statistics, U.S. Government Printing Office, Washington, D.C., 1984.

--------.Putting Our Minds Together: New Directions for Michigan Higher Education. The Governors Commission on the Future of Higher Education in Michigan, Final Report. Lansing: December, 1984.

Reiter, H. "Prediction of College Success from Measures of Anxiety, Achievement Motivation and Scholastic Aptitude. Psychological Reports, 1964, 15, 23-26.

Reyes, Alexander. "Academic Success of San Jose City College Students Using Selected Student Characteristics." Research in Education-ERIC, ED 165-836, California, June 1979.

Reynolds, James W. The Junior College. New York: The Center for Applied Research in Education, Inc., 1965, p. VII.

Russ, John E. "Relationships Between Ability, Family Income and Amount of Financial Aid Received and Persistence in College." Unpublished doctoral dissertation, East Texas State University, 1973, 1-98.

Schroeder, Wayne L., and Sledge, George W. "Factors Related to Collegiate Academic Success." Journal of College Student Personnel, 1966, 7, 97-104.

--------.A Self-Study Report On C.S. Mott Community College. 1985.

Sensor, Phyllis. "A Study of the Mature Woman Attending classes at Riverside City College During the Spring Semester, 1964. Research in Education-ERIC, ED Ø1Ø-739, California 1964.

Shelky, Gail. Passages: Predictable Crises of Adult Life, New York: Bantam Books, 1976.

Silver, Jane H. "The Effect of State and Federal Aid Awards on Persistence, Academic Success and Chances for Graduation Among Freshmen Enrolling at North Greenville College in Fall, 1975." Research in Education-ERIC, ED 158-791, 1975.

-------.SPSS Statistical Package for the Social Sciences. Users' Guide, Chicago: McGraw-Hill Book Company, 1984.

Stein, June. "Academic Success of Students Carrying More than the Traditional Full-time Credit Load at Minneapolis Community College February 198Ø." Research in Education-ERIC, ED 184-638, 198Ø.

Spurlin, M. "A Study of the Relationship of Sex, Ability Level and Biology Preparation to Achievement in Freshman Biology at Metropolitan State College." Unpublished doctoral dissertaion, University of Colorado, 1968.

Tatham, Elaine, "Nursing and Dental Hygiene Selection Procedures Part 2: An Examination of Academic Variables as Predictors of Success." Johnson County Commuity College, Overland Park, Kans, Muich 1976.

Thornton, James W., Jr. The Community Junior College. New York: John Wiley and Sons, Inc., 1972.

Thurston, A. "Now That We Are Nine Feet Tall - A Look at Junior College Students." Junior College Journal, June, 1962, 334.

-------.U.S. Office of Education. Opening (Fall) Enrollment in Higher Education, 1962: Institutional Data. Washington, D.C. : Government Printing Office, 1962.

Vaughn, George B. "Forging the Commnity College." Educational Record, Summer 1984, 65, 24-29.

Wenc, Leonard M. "The Role of Financial Aid in Attrition and Retention." College Review Board. Summer 1977, 17-21.

Winder, James B. "A Comparison of Certain Factors in Students With and Without Financial Aid at Austin College." Unpublished doctoral dissertation, North Texas State University, 1972, 1-118.

Yess, James P. "Predicting the Academic Success of Community College Students in Specific Programs of Study." Unpublished doctoral dissertation, Research in Education-ERIC, ED 172-900, Boston University, January 1979.

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