REASONS WHY STUDENTS DO OR DO NOT TAKE ELECTIVES

IN MATHEMATICS IN OSCEOLA COUNTY, FLORIDA

A Thesis

Presented to

the Faculty of the Graduate School

Appalachian State Teachers College

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Education

by

Douglas Parker Young

August 1958

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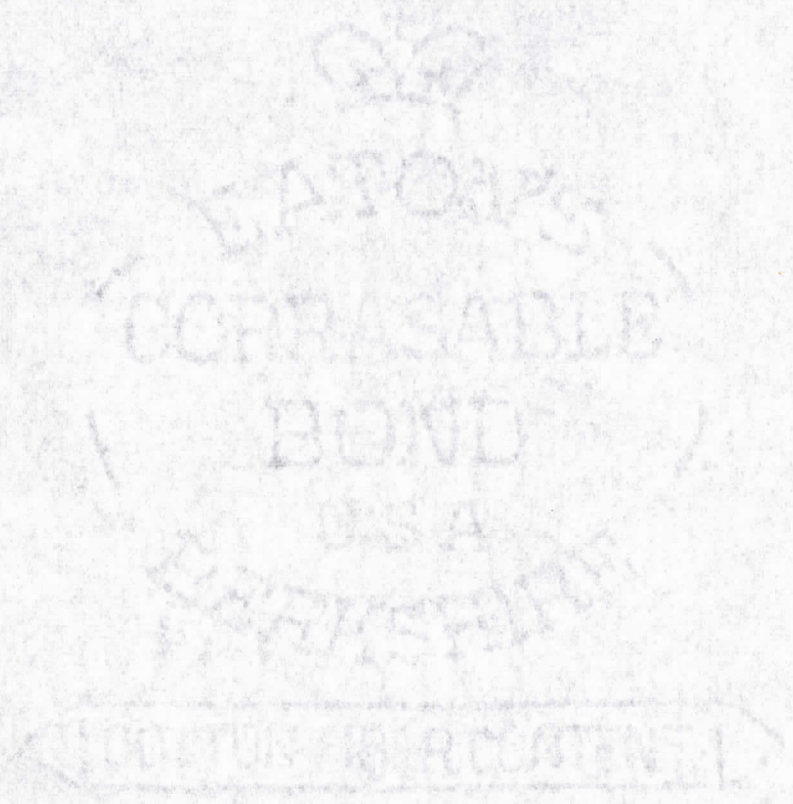
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The purpose of this study was to determine the reasons why students do or do not take electives in mathematics.

The procedure used in this study was to administer a questionnaire to all the high school seniors in Osceola County, Florida. The questionnaire was administered first to the sixty seniors in the Osceola High School in Kissimmee and then to the forty seniors in the Saint Cloud High School in Saint Cloud.

The results of this study showed that well-qualified teaching is the best influence on students taking electives in mathematics. The main reason students do not take electives in mathematics is that they think it is too hard for them and that they do not like the subject. About two-thirds of the students take more mathematics than is required for graduation. Algebra I is the most popular mathematics course with general mathematics, algebra II, and geometry about the same in popularity.

It was concluded that well-qualified teaching is the best method to use in attracting students to take electives in mathematics. Students who like mathematics tend to take electives. They also find the subject easy and thus make good grades. Students who do not take electives in mathematics find the subject difficult to comprehend. They do not like the subject and generally do not make good grades in mathematics. There is a tendency for students who do take electives to come

from homes with a higher socio-economic status and a higher educational level than that of the students who do not take electives in mathematics.

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CHAPTER I

INTRODUCTION

Education for all is one of the aims of people organized in our democratic way of life. Our educational system has spread from humble beginnings to the present virtual free and public instruction for all. During this development obstacles have been overcome and new knowledge has been discovered. Quite naturally this new knowledge has created new and challenging problems.

Today our educational system has many problems of a physical nature. Public schools are overflowing to such an extent that there are not adequate buildings and other facilities to take care of the large number of students. The lack of well-qualified teachers is a problem that must be faced and dealt with soundly.

Growing out of the physical problems come more problems of a more intangible nature. Of these, the most important is the possible decrease in the quality of instruction due to rapid expansion. Interrelated with this is the absence of desired changes sought in pupils and the reported lack of interest in some subject fields.

I. THE PROBLEM

Statement of the Problem. The reported lack of interest

in some subject fields has brought to light a problem that is a vital one, not only in educational circles, but to our whole democratic way of life.

The communistic countries are reportedly educating far more scientists and mathematicians than we who believe in a democracy.[1] Too few of our students are taking mathematics in high school and too few show an interest in the subject.

Even though mathematics is required to some extent, this is not enough. The lack of interest in and pursuit of electives in mathematics has created a problem which is vividly felt.

Importance of the study. The lack of interest in and pursuit of electives in mathematics is alarming. There are unlimited opportunities presented in many technical fields in which mathematics is a prerequisite. Yet, less than one-seventh of the seniors in high schools in the United States take trigonometry and solid geometry, which can be said to be the two major electives in high school mathematics.[2] Studies in this area have been very limited and few deal directly with this problem. Before schools can entice students to

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[1]"Russia As Science Leader," Science News Letter, 69:199, March 31, 1956.

[2]Kenneth E. Brown, "National Enrollments in High School Mathematics," The Mathematics Teacher, 49:366-7, May, 1956.

enroll in electives in mathematics, the reasons why they voluntarily do or do not must be found.

Need of the study. Most studies in mathematics deal with methods, ability, and such, but seldom has one dealt with the reasons why subjects are or are not taken. The reasons for lack of interest and students not taking more mathematics than required must be found and dealt with accordingly.

II. PURPOSE OF THE STUDY

The purpose of this study was to determine why high school seniors in Osceola County, Florida have not taken more mathematics than that which is required.

III. DEFINITIONS OF TERMS USED

Mathematics. Mathematics in relation to this study is interpreted as meaning the logical study of shape, arrangement, and quanity.[3]

Beginning algebra. Beginning algebra has the meaning of the first course or introduction in algebra which is a generalization of arithmetic in which letters denote

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[3]Gleen James, Mathematics Dictionary (revised edition: Van Nuys, California: The Digest Press, 1943), p. 157.

any number, or numbers.[4]

Advanced algebra. Advanced algebra is the second course in algebra which deals with more advanced topics.

General mathematics. General mathematics is interpreted throughout this study as meaning the course in mathematics dealing with the fundamental operations and their everyday applications.

Plane geometry. Plane geometry has the meaning of the branch of geometry which treats of the properties and relations of plane figures (such as angles, triangles, polygons, and circles) which can be drawn with ruler and compasses.[5]

Solid geometry. Solid geometry is the branch of geometry which studies figures in space (three dimensions) whose plane sections are the figures studied in plane geometry, such as angles between planes, circles, spheres, and polyhedrons.[6]

Trigonometry. Trigonometry is the study of the ratio between the sides of triangles, the relations between these

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[4] Ibid., p. 6.

[5] Ibid., p. 113.

[6] Ibid., p. 114.

ratios, and their applications, especially in solving tri-
angles (finding the remaining parts when a sufficient number
is known) in surveying, range-finding, navigation, construc-
tion work, etc.[7]

Terminal mathematics. Terminal mathematics is the
senior mathematics course dealing with a final review of
the fundamental operations and their applications in all
forms of everyday life.

Elective. Throughout this study the term "elective"
is interpreted as meaning those courses not required by the
school for graduation.

Subject. The term "subject" is interpreted as meaning
the credit for which a course is depicted in Carnegie Units.

Course. The term "course" has the same meaning as a
subject. An interchanging of the use of these terms does not
imply a meaning otherwise.

Unit. The term "unit" is interpreted as representing
a year of study in any major subject in secondary school
which cannot be accomplished in less than one-hundred and

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[7]Ibid., p. 262.

twenty sixty-minute hours, or their equivalent.[8]

High School. High school means grades nine through twelve inclusive.

[8]Ellsworth Tompkinns, and Walter H. Gaumnitz, The Carnegie Unit: Its Origin, Status, and Trends, United States Department of Health, Education, and Welfare, Bulletin 1954, Number 7 (Washington: Government Printing Office, 1954), p.4.

CHAPTER II

REVIEW OF THE LITERATURE

Much has been written in regard to ability, achievement, and methods in mathematics. Only a small portion of the literature pertaining to mathematics education deals with why students take subjects that are not required and why they do not take electives in mathematics. A brief summary of the literature related to the problem will be presented here.

I. TYPES OF MATHEMATICS OFFERED

Mathematics is one of the tool subjects and is therefore taught in every high school. Requirements for the number of units of mathematics taken by students vary, but apparently every school requires a certain number for graduation. Usually this number is two. This requirement usually determines the type of mathematics offered.

Sanford conducted a study to determine what mathematics was offered by 240 public high schools in Illinois. In those high schools, it was revealed that practical mathematics was available in about 50 per cent of the schools with less than 250 students and in about 75 per cent of the schools with more than 250 students. Advanced algebra was offered in approximately 50 per cent of the schools with

less than 100 students and in more than 90 per cent of the others. Solid geometry was offered in about 30 per cent of the schools with fewer than 100 pupils, and in 83 per cent with 250-499 pupils, and in more than 96 per cent of the schools with 500 pupils or more. College algebra was not offered in any school that had less than 500 pupils, but it was offered by 3 per cent of the schools with 500-999 pupils, and by 31 per cent with 1000-1999 pupils, and by 43 per cent with 2000 or more pupils.[9]

Another study was conducted by Schaaf to determine what constituted the curriculum practice with respect to the lower high school grades. His results showed that of the mathematics taught in the schools, 36 per cent was general mathematics, 5 per cent unified mathematics, 7 per cent "cumulative" mathematics, 51 per cent conventional general mathematics and algebra in the ninth grade, and 1 per cent of the mathematics was of some other kind not listed in his questionnaire.[10]

McCamey conducted a study to determine the type of mathematics taught, whether conventional or reorganized,

[9]Charles W. Sanford, "High School Science and Mathematics—For Whom and For What," School Science and Mathematics, 50): 307-19, April, 1950.

[10]William L. Schaaf, "Current Trends in Junior High School Mathematics," School Science and Mathematics, 35: 959-69, December, 1935.

and how the objectives of traditional and reorganized mathematics differ. In analyzing 53 city and state courses of study for ninth grade mathematics published since 1929, he found that 35, or 66 per cent, offered conventional mathematics and 18, or 34 per cent, offered reorganized mathematics. Four courses of study did not list objectives at all. Less than 50 per cent of the courses gave general objectives for ninth grade mathematics. Of the reorganized courses 56 per cent did, while of the conventional courses 43 per cent did. There were lists of objectives compiled which totaled 72 for the conventional and 46 for the reorganized courses.[11]

Brown and Obourn, under the auspices of the United States Department of Health, Education, and Welfare, conducted a study to determine the offerings and enrollments in science and mathematics in public high schools in the fall of 1956. The information was obtained from a 10 per cent sample of these schools selected at random. In regular four-year high schools they found that 68.2 per cent offered general mathematics (in the ninth grade), 91.3 per cent offered elementary algebra, 75.2 per cent offered plane geometry, 55.2 per cent offered intermediate algebra, 18.5

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[11]Kathryn McCamey, "Objectives of Ninth-Grade Mathematics in Recent Courses of Study," School Science and Mathematics, 38: 972-5, December, 1938.

per cent offered solid geometry, 24.1 per cent offered plane trigonometry, and 13.7 per cent offered other mathematics.[12]

II. AMOUNT OF MATHEMATICS TAKEN

Brown and Obourn, in their study to determine the offerings and enrollments in science and mathematics in public high schools in the fall of 1956, found the following information concerning the enrollments of students in certain mathematics courses. In regular four-year high schools they found that 44.6 per cent of the pupils were enrolled in general mathematics, 69.5 per cent in elementary algebra, 40.3 per cent in plane geometry, 29.6 per cent in intermediate algebra, 7.9 per cent in plane trigonometry, and 7. 1 per cent in solid geometry.[13]

Bennett attempted to answer questions concerning the number of students taking mathematics. The results of his study showed that of the sampling of high school graduates of 1920 and earlier, 99.4 per cent reported credit in algebra; for the 5 years 1921-25, 98.2 per cent; and by 1943 the percentage had dropped to 94 per cent. Of the graduates

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[12]Kenneth E. Brown, and Ellsworth S. Obourn, Offerings and Enrollments in Science and Mathematics in Public High Schools, United States Department of Health, Education, and Welfare, Pamphlet Number 120 (Washington: Government Printing Office, 1957), p. 23.

[13]Ibid., p. 31.

of 1920 and earlier, 96.9 per cent had taken some geometry
in high school; for the 5-year period ending 1925, 95 per
cent; and by 1943 the percentage was 80 per cent. In the
average number of units taken, the period showing the largest
average amount of algebra completed in high school was the
period of 1910-14 which showed 1.42 units. During this per-
iod 76.2 per cent of the graduates had completed one and one-
half years of algebra, 18.2 per cent had completed one year,
and 4.9 per cent reported two years. Beginning with 1915-19,
the percentage reporting one and one-half units showed a
constant decrease. In 1943, 71 per cent reported one unit,
while only 12.7 per cent reported one and one-half units
and 10.3 per cent reported two units. In geometry the same
trend appears. For the period 1910-14, 62.9 per cent of the
graduates reported one and one-half units of geometry, and
32.2 per cent reported one unit. In 1943, 9.3 per cent
reported one and one-half units, while 70.7 per cent reported
one unit.[14]

Sanford in his study to determine the number of students
enrolled in mathematics found that 3.4 per cent of the high
school students in Illinois in 1947-48 enrolled in eleventh

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[14]Raymond D. Bennett, "Trends in the Amount of Mathe-
matics and Science in High School," School Review, 52:406-12,
September, 1944.

and twelth grade courses in mathematics. Of those students entering the University of Illinois in September of 1948, 63 per cent had had two and one-half units in mathematics; 51 per cent, three units in mathematics; 12 per cent, three and one-half units in mathematics; 6 per cent, four units in mathematics. Of the students in grades nine and ten, 20 per cent were taking ninth grade algebra; 11 per cent, some other ninth grade course in mathematics; and 13 per cent, plane geometry.[15]

Renner conducted a study to determine the course patterns in mathematics, and the degree of functional competence that students achieve which is characteristic of studying a particular course pattern. He found that of 1227 high school seniors in Iowa, there were 22 distinct course patterns, each of which had been followed by 9 or more students. The most popular course pattern among the students who participated in the study was two semesters of algebra and two semesters of geometry. He concluded that a student's level of achievement of functional competence depends more upon the mathematics courses which are studied in grades 10, 11, and 12 than it depends upon the courses studied in the ninth grade.[16]

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[15] Sanford, loc. cit.

[16] John W. Renner, "Course Patterns in Mathematics Studied by High School students," School Science and Mathematics, 55: 644-50, November, 1955.

In a study made by Brown concerning enrollments in high
school mathematics, he found that the enrollment in general
mathematics, which was offered in the ninth grade, was equal
to 44.5 per cent of the number of pupils in the ninth grade.
The enrollment in the elementary algebra course was equal to
37.4 per cent of the number of pupils in the tenth grade.
The enrollment in intermediate algebra was 28.5 per cent of
the number of pupils in the eleventh grade, and the enroll-
ments in trigonometry and in solid geometry were approximately
13 per cent of the number of pupils in the twelfth grade.[17]

III. VOCATIONAL ASPECT OF MATHEMATICS

Mathematics may be one of the most useful of all sub-
jects in any vocation. However, relatively few studies have
been made concerning the vocational use of mathematics.

Hill conducted a study to determine the vocational uses
of elementary high school algebra. The respondents to his
questionnaire were divided into seven groups according to
their occupations--professional, agricultural, household arts,
trades, commercial and industrial, fine arts, and public ser-
vice. Of these, 80 per cent were either in the professional
or commercial-industrial group. Within these seven main
groups there were 38 different occupations represented.

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[17]Brown, loc. cit.

His results were that five vocations--professional engineers, science teachers, scientific research workers, business and industrial research workers, and equipment engineers--find all or practically all of the algebraic concepts relatively essential to them as vocational tools. The remaining 33 vocations found different concepts seemed to be most useful: (1) Literal numbers, (2) Linear equations and formulas, (3) Positive and negative numbers, (4) Addition and subtraction of algebraic qualities, (5) The statistical graph, and (6) Ratio, proportion, and variation. Only slightly more than one-third of the elementary algebra taught functions as a vocational tool. The concept of solving simultaneous linear equations graphically was reported as used least of all. Women engaged as housewives, nurses, and stenographers reported almost no algebra used in their vocations. Those respondents engaged in college teaching, library work, fine arts, public service, and certain technical business pursuits reported the use of slightly more algebra than that represented by the six concepts listed above. Twenty-three of the 38 vocations reported no use of algebra beyond these six concepts. Sixty per cent of the respondents would have all students required to take algebra.[18]

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[18]George E. Hill, "The Vocational Uses of Elementary High School Algebra," School Science and Mathematics, 32: 641-3, June, 1932.

Dickeman conducted a study to determine whether mathematics should be taught concerning everyday problems in industrial activities, manufacturing, and trade work for boys, and a similiar course taught for girls which would apply to their particular needs and interests, all in the group not going to college. Ninty-three per cent of the respondents to his questionnaire reported that they were in favor of a special course in mathematics for high school boys who go directly from school to industry. Opposed to such a course were seven per cent. Eighty-three per cent reported that there should be a separate course for boys and another for girls. Eighty-eight per cent reported that they would offer the same credit for such courses that is now offered for commercial and general mathematics.[19]

In a study by Turner to find the greatest out-of-school use of mathematics, he found the out-of-school uses of mathematics to be the use of money in everyday situations, budgeting allowances, purchasing, and the determination of profit or loss on sales.[20]

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[19] Fred A. Dickeman, "High School Mathematics and the Eighty Per Cent," American School Board Journal, 101: 41-2, September, 1940.

[20] Claude F. Turner, "What Need for Mathematics in Grade VIII," School Review, 45: 592-601, October, 1937.

IV. WHY STUDENTS LIKE AND DISLIKE MATHEMATICS

Why students like and dislike mathematics is one of the questions which must be answered if there is to be any improvement in the situation which now exists. Studies dealing with this subject are rare and this scarcity indicates that research along this line should be done.

Turner conducted a study dealing with this problem in which his purpose was to find out why eighth grade students like and dislike mathematics. His results showed that: 163 liked mathematics because of "future use in home and vocation," 121 liked mathematics because of "present use in home and school," 111 liked mathematics because of "present enjoyment and entertainment," and the other reasons were scattered widely. To the question "why do you dislike mathematics?," forty stated "a lack of ability and slow to understand," thirty-four said "too much detail; complicated and difficult to understand," eighteen said "repetition of tiresome explanations; too long periods," and the other reasons were widely scattered.[21]

Poffenberger and Norton conducted a study to identify the factors determining the attitudes students have toward mathematics. The results of this study show that parents

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[21] *Ibid.*

determine to a great extent the attitudes the child has
toward mathematics. The parents either push the child too
hard, or do not recognize his ability and do not encourage
him in mathematics. Teachers also seemed to determine some-
what the attitudes that students have toward mathematics
by their own enthusiasm or lack of interest in the subject,
and by their excellent or poor methods in presenting the
subject.[22]

Buckland, in a study to determine the reasons why
North Carolina high school students like or dislike mathe-
matics, grouped his findings under eight headings of likes
and under seven headings for dislikes. The reasons for liking
mathematics are listed in order from the most popular to the
least popular. They are: essential for future work, excel-
lent teacher, interesting subject, ease of comprehension,
developed reasoning power, no reason, created feeling of
accomplishment, and study was fun. The reasons for disliking
mathematics are also listed in order from the most popular
to the least popular. They are: too difficult, disliked
teacher, student was not interested, poor teaching practices,
not essential for future work, no reason, and repetition of

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[22] Thomas Poffenberger, and Donald A. Norton, "Factors
Determining Attitudes Toward Arithmetic and Mathematics,"
Arithmetic Teacher, 3: 113-6, April, 1956.

last year's work. Statewide there ere 70.2 per cent liking
mathematics and 29.8 per cent disliking mathematics.[23]

V. WHERE DO ELIGIBLE MATHEMATICS TEACHERS GO?

Heading the list of needed teachers are mathematics
teachers. The need for teachers today is greater than ever
before and especially so for mathematics teachers. Many
reasons enter into determining why mathematics majors or
eligible mathematics teachers turn their backs on the teach-
ing profession. Probably the best way to answer this "why"
is to see "where" eligible mathematics teachers go.

Maul conducted a recent study in which his purpose was
to find out how many college graduates are prepared to teach
mathematics, how many are teaching it, or what they are
doing after graduation. His results showed that in 1955
there were 2,250 mathematics majors graduating eligible to
teach mathematics. This is a 51.3 per cent drop from the num-
ber eligible to teach mathematics in 1950. In 1954 there were
2,223 eligible mathematics teachers graduating. Of this
number 59 per cent were teaching mathematics in 1955. Nine
and six-tenths per cent were otherwise gainfully employed.

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[23]Golden T. Buckland, "A Study of the Reasons North
Carolina High School Students Like or Dislike Mathematics,"
(winter project in partial fulfillment of the requirements
for the degree of Doctor of Education, Pennsylvania State
University, 1952-53), pp. 11-24.

Six and three-tenths per cent were continuing formal study, while fifteen and five-tenths per cent were in military service. Engaged in homemaking were two and nine-tenths per cent. Those seeking employment were nine-tenths per cent. No information could be found on five and eight-tenths per cent.[24]

[24] Ray C. Maul, "Where Do Eligible Mathematics Teachers Go?," Mathematics Teacher, 48: 397-400, October, 1955.

CHAPTER III. PROCEDURE

I. THE SETTING

The setting used for this study was Osceola County, Florida. Osceola County is in central Florida and borders the citrus belt. The main livelihood is derived from citrus groves and cattle ranches. The tourist industry is one that is growing fast also. Osceola County is ideal for boating and fishing with its numerous large and small lakes that dot the county.

The county seat is Kissimmee, a fast growing town of nine-thousand. The largest high school in the county is Osceola High School which is in Kissimmee. It has an enrollment of three-hundred and seventy-five students, of which thirty-five per cent are transported by bus.

The only other white high school in Osceola County is located in Saint Cloud, a small town of four-thousand. Saint Cloud High School has an enrollment of two-hundred and two students of which forty per cent are transported by bus.

II. THE QUESTIONNAIRE

The questionnaire[25] administered in this study contained

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[25] A copy of the questionnaire is found in the appendix

questions which were intended to bring out the socio-economic status of the respondents. Such questions as "occupations of father and mother," "home ownership," "automobile ownership for the family," "martial status of parents," "level of education of parents," and "book clubs and magazines subscribed to" were intended for this purpose.

Other questions relating to the outline of the high school courses the respondents were following and the listing of all mathematics courses taken in high school were intended for specific statistical purposes.

There were two sections of questions asked. One section pertained to those who had taken more mathematics than required. The other section concerned those who had not taken more mathematics than required. These questions were more of a personal inventory of their reasons for or for not taking more mathematics than required.

The writer administered the questionnaire first to the sixty seniors in Osceola High School. All sixty members were together in a group. Questions were asked for by the writer and all were answered before the questionnaire was completed. One section of the questionnaire was completed at a time with the writer giving specific instructions for each section. All additional questions raised by the respondents were answered.

After administering the questionnaire first to the seniors in Osceola High School, the writer then went to the Saint Cloud High School and there administered the questionnaire to the forty seniors. The same method was employed as was described above.

The questionnaires of both groups were gathered and compiled into tabulated facts which are presented later.

III. THE GROUP USED

The group used for this tudy was all the white high school seniors in Osceola County. There were sixty seniors in Osceola High School in Kissimmee and forty seniors in Saint Cloud High School in Saint Cloud. All one-hundred seniors completed the questionnaire.

In Osceola High School in Kissimmee, the following mathematics courses are offered: (1) algebra I, (2) algebra II, (3) general mathematics, (4) geometry, (5) trigonometry, and (6) terminal mathematics. Although only one year of mathematics is required by the state of Florida for graduation, Osceola High School requires that a student complete two units for graduation.

In Saint Cloud High School in Saint Cloud, the curriculum in mathematics is as follows: (1) algebra I, (2) algebra II, (3) general mathematics, (4) geometry, and

(5) trigonometry. One unit of mathematics is required for graduation from Saint Cloud High School.
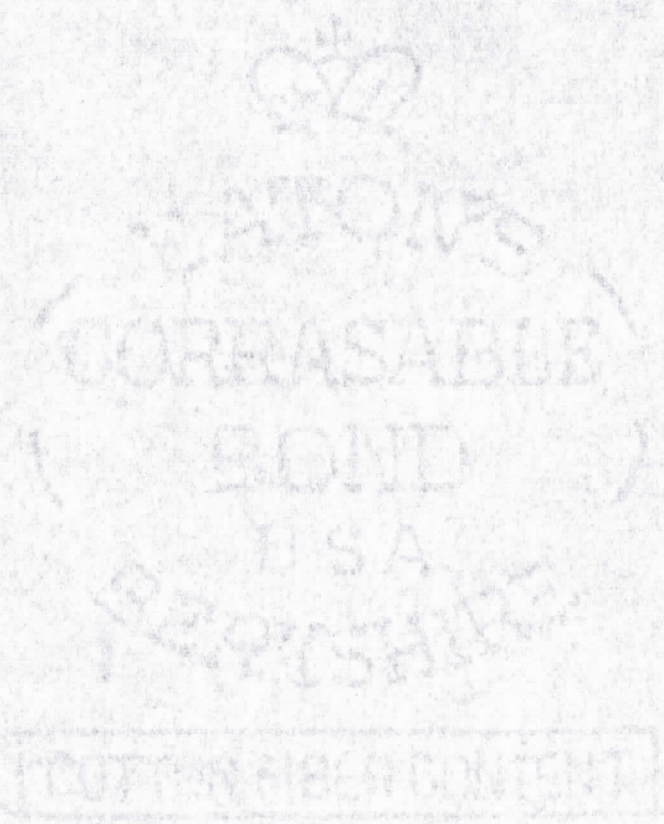
CHAPTER IV RESULTS

The questionnaire in this study was used primarily for the purpose of determining the reasons why high school seniors in Osceola County, Florida do or do not take electives in mathematics. At the time this questionnaire was administered, there were sixty seniors in the Osceola High School and forty seniors in the Saint Cloud High School.

In order to present a clear picture the reasons for and against taking more mathematics on the part of seniors at Osceola High School are presented first, and the reasons indicated by seniors in the Saint Cloud High School second. The reasons of seniors from both schools are then combined and presented. A look will be given to the socio-economic background of each group and comparisions made with those who do and those who do not take electives in mathematics. A comparision will also be made concerning the educational level of the parents of those who do and those who do not take electives.

I. COMPARISION OF THOSE WHO DO AND DO NOT TAKE ELECTIVES

A. OSCEOLA HIGH SCHOOL SENIOR CLASS

There were sixty members of the senior class when this questionnaire was administered. All sixty members completed the questionnaire.

The number of students taking more mathematics than required was 37 or 61.7 per cent, while the number taking just the required amount was 23 or 38.3 per cent. The number of students following the three types of curriculum outlines were as follows: general, 41.6 per cent; vocational, 31.7 per cent; and college preparatory, 26.7 per cent.

The number of students having taken the following courses were: general mathematics, 23 or 38.3 per cent; algebra I, 40 or 85.0 per cent; algebra II, 29 or 48.3 per cent; geometry, 28 or 46.6 per cent; terminal mathematics, 23 or 38.3 per cent; trigonometry, 9 or 15.0 per cent.

Of the 37 students who had taken more mathematics than required, the following were indicated as reasons for taking electives:

1. College entrance requirements. Over half of the students indicated that this was one of their reasons for taking electives. It must be remembered that 16 or 26.7 per cent of the total senior class were following college preparatory outlines and would most likely give this as a reason for their taking electives.

2. You like mathematics. Almost two-thirds of the students said that they liked mathematics to such a degree that it influenced their taking electives.

3. Your grades have always been good in mathematics. A little more than half of the respondents said that they had

always made good grades in mathematics and that prompted
them to take electives.

4. **Mathematics is easy for you**. The same number of
respondents gave this as one of their reasons as did for
"your grades have always been good in mathematics." This
probably indicates that if a subject is easy, then making
good grades will likely follow. It is very likely that a
large per cent of the respondents who indicated one of these
two reasons also indicated the other.

5. **Your parents strongly advised you to take mathematics**. This reason was indicated by fewer students than any
other, reflecting either a lack of interest on the part of
parents or a lack of encouragement to the students to use
their abilities.

6. **You liked the teacher or teachers of mathematics**.
Slightly more than three-fifths gave this as a reason for
their taking electives. This speaks well for the personal
qualities of the mathematics teachers in Osceola High School.

7. **You thought the mathematics teacher or teachers
were well-qualified teachers**. This reason was answered yes
by more students than any other. Over three-fourths of the
respondents gave this as one of their reasons for taking
electives, thus reflecting very strongly the respect the students have for the teaching ability of the mathematics
teachers in Osceola High School.

8. <u>You had good mathematics teaching in elementary school.</u> Slightly more than three-fifths gave this as one of their reasons, also tending to show a respect for the elementary teachers and their ability to teach mathematics.

9. <u>You thought you needed mathematics for the job you are planning for.</u> Almost three-fourths of the respondents answered yes to this reason, indicating that the students respect the value and worth of mathematics and were motivated to take electives because of this respect.

Of the 23 students who had not taken more mathematics than required, the following were indicated as their reasons:

1. <u>You are not going to college.</u> Over one-fourth of the respondents gave this as one of their reasons for not taking electives.

2. <u>You did not think you needed mathematics.</u> Again over one-fourth said that they saw no need for mathematics and therefore did not take any electives.

3. <u>You do not like mathematics.</u> Over one-third of the respondents gave this reason, showing that mathematics is not a popular elective.

4. <u>Mathematics is hard for you.</u> Almost half of the respondents gave this as an answer, making it the most popular reason of all and probably showing some correlation with the dislike for mathematics.

5. <u>Your grades have always been poor in mathematics.</u>
Slightly over one-fifth said that they had always made poor
grades in mathematics. This may indicate that students have
more ability than they like to use.

6. <u>You did not like the teacher or teachers in mathe-
matics.</u> Only about one-sixth of the respondents indicated
that they had a dislike for the teacher or teachers of mathe-
matics. Again this speaks well for the personal qualities
of the mathematics teachers in Osceola High School.

7. <u>You thought that the teacher or teachers of mathe-
matics were not well-qualified teachers.</u> Only one respondent
gave this as a reason for not taking electives, reflecting
once more that the mathematics teachers of Osceola High
School have won the respect of their students.

8. <u>Your parents advised you not to take mathematics.</u>
Only two students said that their parents advised them not
to take electives in mathematics.

9. <u>You did not have good mathematics teaching in
elementary school.</u> Almost one-third of the respondents gave
this as a reason, in almost direct contrast to the response
given by students who had taken electives.

A look at the socio-economic backgrounds of the two
groups in the senior class of Osceola High School discloses
very interesting data. The following information was

revealed from the group who had taken electives, that is, a larger per cent of the respondents in this group indicated these facts than did the group who had not taken electives: there are brothers or sisters in the family, many of the parents are separated or divorced, there are more parents who have professional occupations, most of them live within the city limits, a good per cent of the families subscribe to magazines, and more families are members of at least one book club.

The following facts were indicated by a larger per cent of the group who had not taken electives: both parents work, the family owns an automobile, the family owns at least one new automobile, the family owns more than one automobile, the family owns their own home, the respondent works after school or on Saturday, and the family goes on vacation every year.

The levels of education for those who do take electives are as follows:

Mother. Only three did not go beyond the eighth grade while twenty-seven finished their formal schooling somewhere within the high school grades. Three had taken some work at the college level and three ended their formal education with the college degree. Only one attained a master's degree. There were six who went to a trade, commercial, or other type of school.

Father. There were eight who did not continue beyond
the eighth grade. This was almost three times the number for
the mother. Twenty-one did not continue beyond the high
school grades. There were three who did some college work
while two ended their formal education with a college degree.
There was one who finished a master's degree and also one
who attained a doctor's degree. Five attended a trade, com-
mercial, or other type of school. There was one respondent
in this group who did not know the educational level of his
father.

The levels of education for those who do not take
electives are as follows:

Mother. There were six who did not go beyond the
eighth grade and fourteen who ended their formal education
within the high school grades. One mother had attended col-
lege, but not finished, while one did finish her formal
education with the college degree. One mother attained a
master's degree. There were two who attended a trade, com-
mercial, or other type of school.

Father. There were eight who ended their formal edu-
cation within the first eight grades of school. Twelve did
go to some high school grade. There was one who had attended
college, but not graduated, while one did graduate and ended
his formal education there. It is interesting to note that
only one father in this group went to a trade, commercial,

or other type of school. There was one respondent who did not know the educational level of his father.

B. SAINT CLOUD HIGH SCHOOL SENIOR CLASS

There were forty members of the senior class in the Saint Cloud High School when this questionnaire was administered. All forty members completed the questionnaire.

The number of students taking more mathematics than required was 27 or 67.5 per cent while the number of students not taking electives was 13 or 32.5 per cent. The number of students following the three types of curriculum were as follows: college preparatory, 47.5 per cent; general, 30.0 per cent; and vocational, 22.5 per cent.

The number of students having taken the following courses were: general mathematics, 20 or 50.0 per cent; algebra I, 31 or 77.8 per cent; algebra II, 18 or 45.0 per cent; geometry, 17 or 42.3 per cent; trigonometry, 13 or 32.5 per cent; one student or 2.5 per cent had transfered to Saint Cloud High School and had taken solid geometry. No terminal mathematics course is offered in the Saint Cloud High School.

Of the 27 students who had taken electives, the following were indicated as reasons for their taking electives:

1. College entrance requirements. About three-fifths of the respondents indicated that this was one of their

reasons for taking electives. It must be mentioned here that almost half of the total senior class were following college preparatory outlines and would naturally list this as one of their reasons.

2. You like mathematics. Over four-fifths said this was a reason in their case, making it one of the most popular ones.

3. Your grades have always been good in mathematics. This reason was another popular one as almost three-fourths of the respondents answered yes, probably indicating that since so many liked mathematics they would probably make good grades in the subject.

4. Mathematics is easy for you. Over half said that mathematics was easy for them. This is about the same per cent as was indicated by this same group in the Osceola High School Senior Class.

5. Your parents strongly advised you to take mathematics. A little over two-fifths, fewer than any other group of respondents said that their parents advised them to take mathematics. The same was true with this same group in the Osceola High School Senior Class.

6. You liked the teacher or teachers of mathematics. Almost nine-tenths expressed a liking for the teacher or teachers of mathematics, showing clearly their admiration of

the personal qualifies of the mathematics teachers of Saint
Cloud High School.

7. You thought the teacher or teacher of mathematics
were well-qualified teachers. Here again almost nine-tenths
of the respondents expressed their respect for the teaching
ability of the mathematics teachers in Saint Cloud High
School. This reason, along with reason number six above,
was the most popular one.

8. You had good mathematics teaching in elementary
school. Over four-fifths gave this as a reason. This speaks
well for the teaching ability in mathematics of the elementary
teachers in Saint Cloud. This was the second most popular
reason.

9. You thought you needed mathematics for the job you
are planning for. Almost three-fifths listed this as a
reason, giving it a lower percentage than was given it by the
same group in the senior class of Osceola High School.

Of the 13 students who had not taken more mathematics
than required, the following were given as reasons:

1. You are not going to college. Over three-fourths
of this group said that since they were not going to college
they did not see the need for taking electives. This per
cent was about three times the per cent of the same group
in the senior class of Osceola High School.

2. You did not think you needed mathematics. Slightly more than one-third of the respondents could see no need for taking electives.

3. You do not like mathematics. Over four-fifths gave this as a reason. This was one of the two most popular reasons, and was also a very popular one given by the group in Osceola High School.

4. Mathematics is hard for you. The same number of respondents gave this as a reason as did for reason number three. This indicated that these two reasons go hand in hand.

5. Your grades have always been poor in mathematics. Over two-thirds of the group indicated that they had always made poor grades in mathematics and for that reason were influenced not to take electives. This per cent was about twice that given for this same group in Osceola High School.

6. You did not like the teacher or teachers of mathematics. Only one respondent indicated a dislike for the teacher or teachers of mathematics. Again this speaks well for the personal qualities of the mathematics teachers in Saint Cloud High School.

7. You thought that the teacher or teachers of mathematics were not well-qualified teachers. No respondents answered yes to this reason, thus once again showing the respect the seniors in Saint Cloud High School have for the

teaching ability of the mathematics teachers.

8. Your parents advised you not to take mathematics.
No respondent indicated that his parents advised him not to
take mathematics. This was almost true for the group in
Osceola High School since there were only two who said that
their parents had advised against their taking mathematics.

9. You did not have good mathematics teaching in
elementary school. Once again praise is given to the teachers
in Saint Cloud Elementary School as no respondent gave this
as a reason.

A look at the socio-economic backgrounds of the two
groups in the senior class of Saint Cloud High School reveals
some interesting facts. The following information was reveal-
ed from the group who had taken electives, that is, a larger
per cent of the respondents in this group indicated these
facts than did the group who had not taken electives: there
are brothers and sisters in the family, the parents are either
separated or divorced, both parents work, the parents have
professional occupations, the family owns an automobile, the
family owns more than one automobile, the respondent works
after school or on Saturday, the family goes on vacation every
year, and the family lives within the city limits.

The following facts were indicated by a larger per
cent of the group who had not taken electives: the family
owns at least one new automobile, the family owns their own

home, the family subscribes to magazines, and the family is a member of at least one book club.

The levels of education for those who do take electives are as follows:

Mother. There were only two who did not go beyond the eighth grade while twenty finished their formal schooling somewhere within the high school grades. Three did some work at the college level, but did not graduate and there were two who ended their formal education with the college degree. There were three who went to a trade, commercial, or other type of school.

Father. Seven in this group did no school work beyond the eighth grade and there were twelve who completed their schooling within the high school grades. There was only one who did some college work but did not finish. Two completed their college work but did not continue beyond that level. One attained a master's degree and three had attained a doctor's degree. There were four who had attended a trade, commercial, or other type of school. There was one respondent who did not know the educational level of his father.

The levels of education for those who do not take electives are as follows:

Mother. There were four who did not go beyond the eighth grade. Nine did some work within the high school grades.

No one in this group went to college or did any work beyond the four-year college level. Two did go to a trade, commercial, or other type of school.

Father. Three did not continue their formal education beyond the eighth grade while ten did some work within the high school grades. There was no one in this group who went to college or any graduate school. There was only one who had gone to a trade, commercial, or other type of school.

II. A COUNTY-WIDE COMPARISION OF THOSE WHO
DO AND DO NOT TAKE ELECTIVES

There were one-hundred seniors in Osceola County at the time of the administering of the questionnaire and all one-hundred completed the questionnaire.

Of the 100 seniors there were 37 or 37 per cent who were following a general outline, 35 or 35 per cent following a college preparatory outline, and 28 or 28 per cent following a vocational outline. There were 64 or 64 per cent who had taken more mathematics than required while 36 or 36 per cent had taken only enough mathematics to meet the graduation requirements.

The number of students having taken the following courses were: general mathematics, 43 or 43 per cent; algebra I, 71 or 71 per cent; algebra II, 47 or 47 per cent;

geometry, 45 or 45 per cent; trigonometry, 22 or 22 per cent; terminal mathematics, 23 or 23 per cent; and one student had transfered into the county and had taken solid geometry.

Of those students who had taken more mathematics than required, the following information was found:

1. College entrance requirements. Over half of the respondents gave this as a reason. It is interesting to note that there were more who gave this as a reason than there were following a college preparatory outline.

2. You like mathematics. A very large per cent of the respondents indicated this as a reason. There were over two-thirds who gave it as a reason for taking electives. This number was very close to the number checked yes in other reasons such as: liking the teachers of mathematics, the teachers being well-qualified, good elementary teaching, and needing mathematics for the job they were planning for.

3. Your grades have always been good in mathematics. Slightly over three-fifths of this group said that their grades had always been good in mathematics and thus had influenced their decision for taking electives.

4. Mathematics is easy for you. Over half of the respondents indicated that mathematics was easy for them and therefore was one of the reasons for their taking electives.

5. Your parents strongly advised you to take

mathematics. This reason was the least popular of all in that only a little more than two-fifths gave it as one of their reasons.

6. You liked the teacher or teachers of mathematics. A very large number gave this as a reason. This shows that the teachers of Osceola County were well thought of by the students as almost three-fourths indicated so.

7. You thought the teacher or teachers of mathematics were well-qualified teachers. This reason was the most popular one of all as almost four-fifths of the respondents expressed their respect for the teaching ability of the mathematics teachers of Osceola County.

8. You had good mathematics teaching in elementary school. Once again the respondents showed their respect for the teaching ability in mathematics by the elementary teachers in Osceola County as almost three-fourths gave this as a reason.

9. You thought you needed mathematics for the job you are planning for. Slightly more than two-thirds gave this as a reason. It is interesting to note that this reason was not as popular as those relating to the teacher and his ability.

Of the students who had not taken more mathematics than required, the following information was found:

1. You are not going to college. Less than half of the respondents said that since they were not going to college they did not take electives.

2. You did not think you needed mathematics. Almost one-third of the respondents said they they could see no need for their taking electives in mathematics.

3. You do not like mathematics. More than half stated their dislike for the subject and therefore did not take electives.

4. Mathematics is hard for you. Almost three-fifths of the respondents said that mathematics was hard for them and therefore did not take electives. This was the most popular reason of all and shows some correlation to the reason "you do not like mathematics" as it also was popular.

5. Your grades have always been poor in mathematics. Over one-third indicated that their grades were always poor in mathematics and for that reason did not take electives. It is interesting to note that this was not one of the most popular reasons.

6. You did not like the teacher or teachers of mathematics. Slightly less than one-seventh indicated their dislike for the teacher or teachers of mathematics.

7. You thought that the teacher or teachers of mathematics were not well-qualified teachers. Only one respondent expressed his feelings against the teaching ability of the

teacher or teachers of mathematics. This shows an over-whelming amount of respect for the mathematics teachers and their ability in Osceola County. This was the least popular reason.

8. <u>Your parents advised you not to take mathematics.</u> Only two respondents said that their parents had advised them not to take electives. This may tend to show that the parents thought their children had ability in mathematics or they had very little interest in the courses taken by the student.

9. <u>You did not have good mathematics teaching in elementary school.</u> Almost one-fifth gave this as a reason. Since so many of those who had taken electives spoke highly of the teaching ability of the elementary teachers, it may show that this one-fifth may not have had an aptitude for mathematics.

A look at the socio-economic background of the two groups in the entire county reveals many interesting facts. The following information was revealed from the group who had taken electives, that is, a larger per cent of the respondents indicated these facts than did the group who had not taken electives: there are brothers or sisters in the family, the parents are either separated or divorced, both parents work, the occupation of the parents is professional,

the family goes on vacation every year, the family lives within the city limits, the family subscribes to magazines, and the family belongs to at least one book club. The following facts were indicated by a larger per cent of the group who had not taken electives: the family owns an automobile, the family owns at least one new automobile, the family owns more than one automobile, the family owns their own home, and the respondent works after school or on Saturday.

The levels of education for the families of those who do take electives are as follows:

Mother. There were only five who culminated their schooling within the first eight grades, while forty-seven went to some grade within the high school. Six did some college work but never graduated and there were five who graduated before they ended their formal education. One attained a master's degree. There were nine who went to a trade, commercial, or other type of school.

Father. Fifteen did not go beyond the eighth grade, while thirty-three did some work within the high school grades. Four ended their formal schooling within the first three years of college. There were four who graduated from college and two who attained the master's degree. It was interesting to note that four went as far as a doctor's degree. Nine went to a trade, commercial, or other type of

school and there were two respondents who did not know the level of education of their father.

For those who do not take electives in mathematics the following information was found:

Mother. Ten did not continue beyond the eighth grade. Here again the largest number stopped somewhere within the high school grades, as twenty-three did this. Only one started to college but did not finish, while only one did finish and stopped at that point. There was also one who attained a master's degree. Four attended a trade, commercial, or other type of school.

Father. Again a larger number of fathers ended their formal schooling in the first eight grades than did mothers. There were eleven who did this. Twenty-two did go to some grade within the high school but did not continue beyond that level. Only one began college but did not finish, while only one did graduate. No one did any work beyond the four-year college level. There were two who had attended a trade, commercial, or other type of school. One respondent did not know the educational level of his father.

TABLE I

REASONS WHY STUDENTS TAKE ELECTIVES

List of Reasons	Osceola High School*		Saint Cloud High School**	
	Number	Per Cent	Number	Per Cent
College entrance requirements	21	56.8	16	59.3
You have always liked mathematics	24	64.9	22	81.5
Your grades have always been good in mathematics	21	56.8	19	70.4
Mathematics has always been easy for you	21	56.8	15	55.6
Your parents strongly advised you to take mathematics	18	48.6	12	44.4
You liked the teacher or teachers of mathematics	23	62.2	23	85.2
You thought that the teacher or teachers of mathematics were well-qualified teachers	28	75.7	23	85.2
You had good mathematics teaching in the elementary school	23	62.2	22	81.5
You thought you needed mathematics for the job you are planning for	27	73.0	16	59.3

*There were 37 students in Osceola High School who had taken electives.
**There were 27 students in Saint Cloud High School who had taken electives.

TABLE II

REASONS WHY STUDENTS DO NOT TAKE ELECTIVES

List of Reasons	Osceola High School*		Saint Cloud High School**	
	Number	Per Cent	Number	Per Cent
You are not going to college	6	26.1	10	76.9
You did not think you needed mathematics	6	26.1	5	38.5
You do not like mathematics	9	39.1	11	84.6
Mathematics is hard for you	10	43.5	11	84.6
Your grades have always been poor in mathematics	5	21.7	9	69.2
You did not like the teacher or teachers in mathematics	4	17.4	1	07.7
You thought that the teacher or teachers of mathematics were not well-qualified teachers	1	04.3	0	00.0
Your parents advised you not to take mathematics	2	08.7	0	00.0
You did not have good mathematics teaching in the elementary school	7	30.4	0	00.0

*There were 23 students in Osceola High School who had not taken electives.

**There were 13 students in Saint Cloud High School who had not taken electives.

TABLE III

COUNTY-WIDE REASONS WHY STUDENTS
DO AND DO NOT TAKE ELECTIVES

Reasons for Taking Electives	Number*	Per Cent
College entrance requirements	37	57.8
You have always liked mathematics	46	71.9
Your grades have always been good in mathematics	40	62.5
Mathematics has always been easy for you	36	56.3
Your parents strongly advised you to take mathematics	30	46.9
You liked the teacher or teachers of mathematics	46	71.9
You thought that the teacher or teachers of mathematics were well-qualified teachers	51	79.7
You had good mathematics teaching in the elementary school	45	70.3
You thought you needed mathematics for the job you are planning for	43	67.2

*There were 64 students in Osceola County who had taken electives.

TABLE IV

COUNTY-WIDE REASONS WHY STUDENTS
DO AND DO NOT TAKE ELECTIVES

Reasons For Not Taking Electives	Number**	Per Cent
You are not going to college	16	44.4
You did not think you needed mathematics	11	30.6
You do not like mathematics	20	55.6
Mathematics is hard for you	21	58.6
Your grades have always been poor in mathematics	14	38.9
You did not like the teacher or teachers of mathematics	5	13.9
You thought that the teacher or teachers of mathematics were not well-qualified teachers	1	2.8
Your parents advised you not to take mathematics	2	5.6
You did not have good mathematics teaching in the elementary school	7	19.4

**There were 36 students in Osceola County who had not taken electives.

TABLE V

COUNTY-WIDE SOCIO-ECONOMIC STATUS

Socio-Economic Factors	Those Having Taken Electives*		Those Not Having Taken Electives**	
	Number	Per Cent	Number	Per Cent
Brothers or sisters	62	96.9	31	86.1
Parents separated or divorced	10	15.6	3	08.3
Both parents work	26	40.6	11	30.6
Occupation of parents "professional"	11	17.2	2	05.6
Family owns an automobile	59	92.2	35	97.2
Family owns a new automobile	33	51.6	20	55.6
Family owns more than one automobile	30	46.9	19	52.8
Family owns their own home	47	73.4	30	83.3
Work after school or on Saturdays	41	64.1	25	69.4
Family goes on vacation every year	34	53.1	18	50.0
Live within the city limits	44	68.8	19	52.8
Family subscribes to magazines	50	78.1	26	72.2
Family belongs to a book club	18	28.1	7	17.4

*There were 64 students in Osceola County who had taken electives.
**There were 36 students in Osceola County who had not taken electives.

TABLE VI

EDUCATIONAL LEVEL OF PARENTS

Those Having Taken Electives

	Grades						College						Masters		Doctors		Other	
	1-4		5-8		9-12		1		2		3		4							
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Osceola																				
Mother	0	0.0	3	8.1	27	73.0	1	2.7	2	5.4	0	0.0	3	8.1	1	2.7	0	0.0	6	16.2
*Father	2	5.4	6	16.2	21	56.8	1	2.7	2	5.4	0	0.0	2	5.4	1	2.7	1	2.7	5	13.5
Saint Cloud																				
Mother	0	0.0	2	7.4	20	74.1	1	3.7	1	3.7	1	3.7	2	7.4	0	0.0	0	0.0	3	11.1
**Father	0	0.0	7	26.0	12	44.4	0	0.0	0	0.0	1	3.7	2	7.4	1	3.7	3	11.1	4	14.8
County-wide																				
Mother	0	0.0	5	7.8	47	73.4	2	3.1	3	4.7	1	1.6	5	7.8	1	1.6	0	0.0	9	14.1
***Father	2	3.1	13	20.3	33	51.6	1	1.6	2	3.1	1	1.6	4	6.3	2	3.1	3	6.3	9	14.1

*1 or 2.7 did not know the level attained
**1 or 3.7 did not know the level attained
***2 or 3.1 did not know the level attained

TABLE VII

EDUCATIONAL LEVEL OF PARENTS

Those Not Having Taken Electives

	Grades 1-4		Grades 5-8		Grades 9-12		College 1		College 2		College 3		College 4		Masters		Doctors		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Osceola																				
Mother	0	0.0	6	26.1	14	61.0	0	0.0	0	0.0	1	4.3	1	4.3	1	4.3	0	0.0	2	8.7
#Father	0	0.0	8	34.9	12	52.2	0	0.0	1	4.3	0	0.0	1	4.3	0	0.0	0	0.0	1	4.3
Saint Cloud																				
Mother	1	7.7	3	23.1	9	69.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	15.4
Father	1	7.7	2	15.4	10	76.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	7.7
County-wide																				
Mother	1	2.8	9	25.0	23	63.9	0	0.0	0	0.0	1	2.8	1	2.8	1	2.8	0	0.0	4	11.1
##Father	1	2.8	10	27.8	22	61.1	0	0.0	1	2.8	0	0.0	1	2.8	0	0.0	0	0.0	2	5.6

#1 or 4.3 did not know the level attained
##1 or 2.8 did not know the level attained

CHAPTER V SUMMARY AND CONCLUSIONS

A. SUMMARY

The reported lack of interest in some subject fields
has brought to light a problem that is a vital one. Too
few of our students are taking mathematics in high school
and too few show an interest in the subject. Even though
mathematics is required to some extent, this is not enough.
The lack of interest in and the pursuit of electives in
mathematics has created a problem which is vividly felt.

Much has been written in regard to ability, achieve-
ment, and methods in mathematics. Only a small portion
of the literature pertaining to mathematics education deals
with why students take subjects that are not required and
why they do not take electives in mathematics.

The procedure used in this study was to administer
a questionnaire to all the high school seniors in Osceola
County, Florida. The questionnaire was administered first
to the sixty seniors in the Osceola High School in Kissimmee
and then to the forty seniors in the Saint Cloud High School
in Saint Cloud.

The results of this study showed that well-qualified
teaching is the best influence on students taking electives
in mathematics. The main reason students do not take

electives in mathematics is that they think it is too hard
for them and that they do not like the subject.

B. CONCLUSIONS

The following conclusions may be made based upon the
results of this study:

1. Well-qualified teachers is the most popular reason
students gave for taking electives. Well-liked teachers and
good mathematics teaching in the elementary school also
strongly influence students to take electives.

2. Students who like mathematics tend to take electives.
They also find the subject easy and thus make good grades.

3. College entrance requirements cause students to
take electives in almost every instance when the student is
planning to go to college.

4. Students tend to recognize the need for mathematics
in everyday life and as a prerequisite for certain jobs.

5. Students do not take electives in mathematics
mainly because the subject is too hard for them. Therefore,
they do not like the subject and generally do not make good
grades in mathematics. This may indicate that students have
more ability than they would like to use.

6. Parents seldom influence the student in his choice
of taking electives or not.

7. Students who do take electives tend to come from

homes where the occupation of the parents is professional, the family goes on vacation every year, subscribes to magazines, and belongs to book clubs. This shows that students who do take electives come from homes with a higher socioeconomic status than that of those who do not take electives.

8. Owning automobiles seems to be the main goal for the families of those who do not take electives.

9. There is a tendency for mothers to have had more formal schooling than father.

10. The parents of those who take electives have a much higher educational level than that of those who do not take electives.

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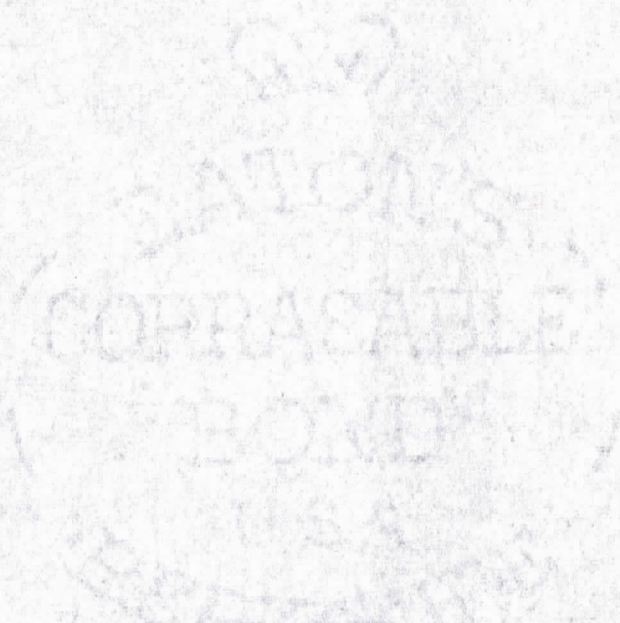
APPENDIX
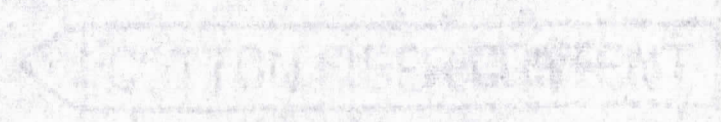
A QUESTIONNAIRE TO DETERMINE THE REASONS WHY STUDENTS
DO OR DO NOT TAKE ELECTIVES IN MATHEMATICS

Age_____ Number of brothers_____; Number of sisters
_____

Are your parents separated or divorced?_____

Does your father work?_____ Does your mother work?_____
Both?_____

Occupation of father_____

Occupation of mother_____

Occupation of guardian_____

Does your family own an automobile?_____; How many?_____
Make and model_____

Do you live in a house?_____; Apartment?_____;
or other?_____

Does your family own the house, apartment, or other?_____

Do you work after school or on Saturdays?_____

Circle the highest level of education for your mother;
Grade 1-4; 5-8; 9-12. College 1; 2; 3; 4; yrs. If any
other than this, please state kind and amount_____
_____

Circle the highest level of education for your father;
Grade 1-4; 5-8; 9-12. College 1; 2; 3; 4; yrs. If any
other than this, please state kind and amount_____
_____

Does your family go on Vacation every year?_____

    Where?_____

Do you live within the city limits?_____

What magazines does your family subscribe to?_____

What book clubs does your family belong to?_____

What curriculum outline are you following? (check only one)

    College preparatory_____
    Vocational   _____
    General   _____

List all of the Mathematics courses you have had in the
    following grades;

    Ninth grade_____
    Tenth grade_____
    Eleventh grade_____
    Twelfth grade_____

If you have taken more than the number of years required for
    graduation during grades 9, 10, 11, 12, please answer these
    questions. (yes or no)

Your reasons for taking more mathematics than required were:

    College entrance requirements
    You like mathematics
    Yours grades have always been good in mathematics_____
    Mathematics is easy for you
    Your parents strongly advised you to take
      mathematics
    You liked the teacher or teachers of mathematics _____
    You thought the mathematics teacher or teachers
      were well qualified teachers
    You had good mathematics teaching in elementary
      school
    You thought you needed mathematics for the job
    you are planning for

If you have not taken more mathematics than the number of
    years required for graduation during the 9, 10, 11, 12,
    please answer these questions. (answer yes or no)

Your reasons for not taking more mathematics than required were:

You are not going to college   ————

You did not think you needed mathematics   ————

You do not like mathematics   ————

Mathematics is hard for you   ————

Your grades have always been poor in mathematics ————

You did not like the teacher or teachers in
  mathematics   ————

You thought that the teacher or teachers in
  mathematics were not well qualified teachers ————

Your parents advised you not to take mathematics ————

You did not have good mathematics teaching in
  elementary school   ————