A STUDY OF THE OPTIMUM SIZE OF THE HIGH SCHOOL

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This is to certify that the

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ABSTRACT

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Statement of the Problem

The purpose of this study was to examine the relationship of secondary school size to per pupil cost and to the quality of the educational program, and to determine if there is an optimum size for the high school in Michigan.

Methodology

The study was designed to analyze the relationship, if any, of secondary school size to per pupil cost as measured by certain selected cost factors, and to the quality of the educational program as measured by several assumed effectiveness factors; and thus to determine if there is an optimum size for the high school in Michigan.

An extensive review of related literature and research was conducted to avoid any duplication of research, and to extend the scope of this study by reviewing previous studies pertinent to the size of the high school which examined factors not included in this study.

Sources of Data

The research data were compiled from official records

of the Michigan Department of Public Instruction and the Bureau of School Services of the University of Michigan which is the official accrediting agency for high schools in Michigan.

Description of the Sample

The sample included 281 high schools, 83 three year high schools and 198 four year high schools. Each classification was further divided into enrollment intervals of 200 such as 0-199 and 200-399. The schools in the sample ranged in enrollment from a low of 76 to a high of 3,255.

Treatment of the Data

The data were tabulated and converted into averages, ratios, or percentages as appropriate and analyzed to determine the relationship, if any, of the size of the selected high schools to per pupil cost as measured by the selected cost factors, and to the quality of the educational program as measured by the assumed effectiveness factors.

Summary and Conclusions

Summary of Principal Findings from the Literature

1. Much of the literature is critical of the small high school, but concern has also been expressed that high schools can be too big as well as too small to provide the best educational opportunities.

2. A definite relationship has not been established between the size of the high school and student achievement.

3. Recommended minimum enrollments tend to center around

an enrollment range from 300 to 500 students for a four year high school.

4. Recommended maximum enrollments tend to center around an enrollment range from 1500 to 2200 students for a four year high school.

5. There does not seem to be any unanimity of opinion on a particular size for the high school, an optimum size, which tends to provide the best educational opportunities at a reasonable cost per pupil.

Summary of Principal Findings from the Study

1. High schools with an enrollment of less than 400 students tend to pay a premium per pupil cost for an inferior educational program.

2. High schools with an enrollment of less than 600 students tend to provide less adequate guidance services than larger high schools.

3. High schools with an enrollment of less than 600 students tend to have a higher percentage of teachers teaching in subject areas in which they do not have a teaching major than larger high schools.

4. High schools with an enrollment of less than 800 students tend to have a lower accreditation rating than larger high schools.

5. Per pupil cost is inversely related to the size of the high school as size increases up to and including the 800-999 enrollment interval for both three and four year high schools, and the quality of the educational program is direct-

ly related to the size of the high school as size increases up to and including the 1000-1199 enrollment interval for both three and four year high schools; but beyond these enrollment intervals, size does not appear to have any consistent relationship to either per pupil cost or the quality of the educational program.

Conclusions

1. The hypothesis that up to a certain size range the size of the high school is inversely related to per pupil cost and directly related to the quality of the educational program; but beyond this size range, size has little, if any relationship to either per pupil cost or the quality of the educational program was accepted as being generally true up to an enrollment range from 800 to 1200 students.

2. The findings of this study indicate that the 1000-1199 enrollment interval is the size range which appears to best satisfy the definition of the optimum size of the high school as that enrollment range which tends to provide a high quality educational program, and beyond which no substantial reduction in per pupil cost or improvement in the quality of the educational program is realized by any further increase in size.

Therefore, if the findings of this study are considered in conjunction with the findings from the review of the literature, it seems logical to conclude that the optimum size for the high school in Michigan is within an enrollment range from 1000 to 1200 students.

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CHAPTER I

INTRODUCTION

The influence of size on the cost and quality of the high school program has long been a subject of concern to many educators and interested laymen alike. In the past most of this concern has been focused on the problems of the small high school. Historically, many high schools were established in areas of sparse population and thus from their inception have often been hampered by small enrollments and insufficient revenue for the operation of an adequate educational program.

Population shifts from rural to urban areas further complicated the problems of many small high schools and made school district reorganization imperative in many areas in order to maintain high schools of an adequate size. But these same population shifts, coupled with the general increase in the population and the ever increasing need for more secondary education, have caused concern in recent years that in many urban and suburban communities the pressure of increasing enrollments and increasing costs may tend to encourage the maintenance of high schools beyond a normally desirable size. The question is: How large is too large?

Need for the Study

There is considerable evidence that the per pupil cost tends to be higher in small high schools and that their programs are usually inferior in quality to those of large high schools. But concern has also been expressed that high schools can be too big as well as too small to provide the best educational opportunities. Oliver expressed this concern when he stated:

> The truth of the situation is that a huge school on clocklike routine and formality can be just as ineffective in wholesome development of the individual as the school traditionally characterized by a narrow curriculum, limited social environment, and inadequate teaching.[1]

Herrick also cautioned that a school which is either too large or too small can impair the effectiveness of the educational program.[2] And Anderson and Van Dyke reported that:

> . . . a number of experienced staffs in large schools are convinced that they are losing something important in the way of close personal relations among students and between students and faculty. They also feel that in a large school a majority of students are at a disadvantage with regard to opportunities for valuable experiences and recognition through the activity program.[3]

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1. A. L. Oliver. "How Big Should the Small School Be?" School and Society, Volume 69 (February, 1949), p. 127.

2. John H. Herrick and others, From School Program to School Plant (New York: Henry Holt and Company, 1956), p. 91.

3. Lester W. Anderson and Lauren A. Van Dyke, Secondary School Administration (Boston: Houghton Mifflin Company, 1963), p. 94.

Thus it would appear that there must be a limit to the advantage of size, a point on the enrollment continuum beyond which the undesirable factors related to bigness begin to outweigh the advantages gained over the small high school; or at least a point of diminishing returns, an enrollment range beyond which the advantage of size begins to level off.

There is a need for additional information concerning the influence of size on the cost and quality of the high school program. Much of the research pertinent to the size of the high school has been concerned primarily with the problems of the small high school and the minimum size required for efficient operation. Consequently, not as much is known about the characteristics of large high schools as about small high schools. Nor does there appear to be any unanimity of opinion on a particular size for the high school, an optimum size, which tends to provide the best educational opportunities.

Many high schools have been built in recent years and many more will have to be built in the years ahead to keep pace with the expanding population and the ever increasing demands on secondary education. If size influences the cost and quality of the high school program, and there is considerable evidence that it does, then size should be an important consideration both in the design of new schools and in deciding whether or not to enlarge existing facilities.

Desirable school size is determined by many factors, not all of which are likely to be present in any one situation. And in a democratic society each school must be designed to meet the needs of the youth and the community which it serves. Nevertheless, if one could determine a particular size for the high school, an optimum size, which tends to provide the best educational opportunities; such information would be a useful criterion whenever decisions pertaining to the size of the high school have to be made.

Statement of the Problem

The purpose of this study was to examine the relationship, if any, of secondary school size in Michigan to per pupil cost and to the quality of the educational program; and thus to determine if there is an optimum size for the high school in Michigan.

Assumptions

This study was based on the assumption that the quality of the high school program is affected by certain selected factors, hereafter referred to in this study as the "assumed effectiveness factors."

Hypothesis

The hypothesis examined in this study was that up to a certain size range the size of the high school is inversely related to per pupil cost and directly related to the qual-

ity of the educational program; but beyond this size range, size has little, if any, relationship to either per pupil cost or the quality of the educational program.

For purposes of examination the hypothesis was restated as a twofold hypothesis: (1) up to a certain size range the size of the high school is inversely related to per pupil cost; but beyond this size range, size has little, if any, relationship to per pupil cost; and (2) up to a certain size range the size of the high school is directly related to the quality of the educational program; but beyond this size range, size has little, if any, relationship to the quality of the educational program.

Methodology

The design of this study is descriptive-survey. The study was designed to analyze the relationship of secondary school size in Michigan to per pupil cost as measured by certain selected cost factors, and to the quality of the educational program as measured by several assumed effectiveness factors; and thus to determine if there is an optimum size for the high school in Michigan.

An extensive review of related literature and research was conducted to avoid any duplication of research, and to extend the scope of this study by reviewing previous studies pertinent to the size of the high school which examined factors not included in this study.

Cost Factors

It was not possible to obtain complete cost data for the operation of the selected high schools because most school districts do not maintain separate financial records for each individual building in the district. Thus it was necessary to select certain cost factors for examination which are indicative of the total cost of operation and for which data were available.

The following cost factors were selected as a measure of the cost of operation of the selected high schools:

A. Cost per pupil for professional staff salaries

B. Cost per pupil for professional staff salaries per unit of educational opportunity

The cost per pupil for professional staff salaries was selected because professional staff salaries are the largest expense in the operation of any public high school. The cost per pupil for professional staff salaries per unit of educational opportunity was selected because this factor is indicative of both the cost of operation and the breadth of the educational offering.

Two other cost factors were also examined. They were:

C. State equalized valuation per pupil within the total school district of which the high school is a part

D. Local tax rate in mills (based on state equalized valuation) for operation of the total school district of which the high school is a part

Cost factors C and D are not based exclusively on data peculiar to the high school. They are based on data pertinent

to the total school district of which the high school is a part. Therefore, they are not pertinent to the hypothesis of this study and were included only as supplemental information.

Assumed Effectiveness Factors

It was not possible to examine all of the factors which might influence the quality of the educational program of a high school; because there are probably an infinite number of such factors, and because the effectiveness of much of the schools efforts cannot be isolated from the effects of the home and the community on the educational experiences of youth. The effect of an educational program is diffused throughout the lives of the students and can be evaluated in the final sense only in terms of their success as adults. Thus this study assumes certain effectiveness factors while recognizing that there are many other factors which may be related to the effectiveness of the high school.

Several factors were selected as a measure of the quality of the educational program. An attempt was made to select factors which are representative of the total school program, which are generally recognized as important characteristics of a good high school, and for which reliable data could be secured.

The following factors were selected as a measure of the quality of the educational program of the selected high schools:

A. Institutional Factors

1. Accreditation

a. Accredited by the University of Michigan

b. Accredited by both the University of Michigan and the North Central Association of Colleges and Secondary Schools

2. Extent of course offering

a. Language Arts (e.g. English, Speech, Journalism)

b. Science

c. Mathematics

d. Social Studies

e. Foreign Languages

f. Fine Arts (e.g. Music, Art, Dramatics)

g. Practical Arts (e.g. Business, Industrial Arts, Homemaking, Agriculture)

h. Health and Physical Education

3. Percent of classes enrolling less than 10 pupils

4. Percent of classes enrolling more than 35 pupils (exclusive of music and physical education)

B. Library Factors

1. Number of usuable books per pupil in library

2. Percent of enrollment which can be seated in library

3. Per pupil expenditure for library services

4. Professional preparation of librarian

C. Pupil Factors

1. Pupil-teacher ratio

2. Ratio of students to guidance counselors

3. Professional preparation of guidance counselors

4. Percent of last years graduates continuing education beyond high school

   a. Percent now attending standard colleges, universities, junior colleges, community colleges, etc.

   b. Percent now attending other types of schools (business, trade, etc.)

5. Percent of dropouts during the previous school year

D. Teacher Factors

1. Percent of teachers with a Masters degree or beyond

2. Teaching Assignment

   a. Percent of teachers whose teaching assignment includes only those subjects in which they have a teaching major

   b. Percent of teachers whose teaching assignment includes one or more subjects in which they have only a teaching minor

   c. Percent of teachers whose teaching assignment includes one or more subjects in which they do not have either a teaching major or minor

   d. Average number of classes and/or study halls met per day by teachers

   e. Average number of different preparations per day for each teacher

   f. Percent of teachers assigned to more than 170 pupils per day

3. Average age of teachers

4. Percent of teachers new to school for current school year

5. Professional experience of teachers

   a. Average number of years of teaching experience

b. Average number of years taught in present school

6. Average salary of teachers

E. Administrative Factors

1. Percent of principals with Masters degree or beyond

2. Average age of principals

3. Professional experience of principals

a. Average number of years of experience including both teaching and administration

b. Average number of years of previous administrative experience

c. Average number of years in present position

4. Average salary of principals

5. Ratio of teachers to administrators (principal and assistants)

F. Building Factors

1. Percent of schools with an auditorium

2. Percent of schools with guidance facilities

3. Percent of schools with a gymnasium

4. Percent of schools with a swimming pool

5. Average age of original building and additions

Sources and Collection of Data

The enrollment data used in this study were obtained from an official publication of the University of Michigan, Michigan Accredited Schools 1963-1964.[4]

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4. Bureau of School Services, Michigan Accredited Schools 1963-1964 (Ann Arbor, Michigan: University of Michigan, Volume 65, Number 27, August 30, 1963).

The research data for the cost factors and the assumed effectiveness factors were compiled from official records of the Michigan Department of Public Instruction and the Bureau of School Services of the University of Michigan, which is the official accrediting agency for all high schools in the state of Michigan. These two agencies were selected as the sources of data for this study because they both collect considerable data from local school officials in Michigan. Thus their records provided a wide range of current and reliable data pertinent to the size of the high school, certainly more data and probably more reliable data than could have been collected by using a questionnaire.

Description of the Sample

The period used for this study was the school year 1962-1963. The sample selected for the study included all of the accredited, public, three and four year high schools in Michigan for which pertinent data were available at both of the selected sources of data; except those high schools which are a part of the School District of the City of Detroit. The selected schools ranged in enrollment from a low of 76 to a high of 3,255. The sample included 281 high schools, 198 four year high schools and 83 three year high schools. Three and four year high schools were classified separately because of the inherent differences in the two types of organization. Each classification was further divided into enrollment intervals of two hundred. The number of schools included in each interval is shown in Table 1.

Table 1

Schools by Enrollment

Enrollment Interval	Three Year High Schools	Four Year High Schools	Total
0- 199	1	12	13
200- 399	5	48	53
400- 599	9	62	71
600- 799	12	19	31
800- 999	8	25	33
1000-1199	11	8	19
1200-1399	9	5	14
1400-1599	1	5	6
1600-1799	6	3	9
1800-1999	9	3	12
2000-2199	6	0	6
2200-2399	3	4	7
2400-2599	3	0	3
2600-2799	0	3	3
Over 2800	0	1	1

Treatment of the Data

The research data were tabulated and converted into averages, ratios, or percentages as appropriate and analyzed to determine the relationship, if any, of the size of the selected high schools to per pupil cost as measured by the selected cost factors, and to the quality of the educational program as measured by the assumed effectiveness factors. The enrollment intervals shown in Table 1 were combined when necessary so that each interval used in the analysis included at least three schools.

Definition of Terms

The minimum size of the high school was defined for purposes of this study as that point on the enrollment continuum

below which a premium per pupil cost must be payed for an inferior educational program.

The maximum size of the high school was defined for purposes of this study as that point on the enrollment continuum beyond which the undesirable factors related to bigness begin to outweigh the advantages gained over the small high school.

The optimum size of the high school was defined for purposes of this study as that enrollment range which tends to provide a high quality educational program as measured by the assumed effectiveness factors, and beyond which no substantial reduction in per pupil cost or improvement in the quality of the educational program is realized by any further increase in size.

Limitations of the Study

A major limitation of this study was the impossibility of examining all of the factors which might influence the quality of the high school program. However, an attempt was made to extend the scope of the study by reviewing previous studies pertinent to the size of the high school which examined factors not included in this study. For example, two factors which are considered by many educators and laymen to be definite advantages of a small high school are (1) in a small high school, teachers know each student better and tend to take a more personal interest in their students; and (2) in a small high school, a greater percentage of stu-

dents gain valuable group experiences through participation in athletics and other school activities. These two factors were not examined directly in this study. But three of the studies reviewed in Chapter II included some observations pertinent to these two factors. (See Chapter II, pp. 43 - 48.)

Certain other limitations were arbitrarily placed on this study to make it more definite and more meaningful. These limitations were as follows:

1. The selected cost factors and assumed effectiveness factors used in this study were limited to those factors for which data were available from either the Bureau of School Services of the University of Michigan or the Michigan Department of Public Instruction. This limitation was imposed to assure both the availability and the reliability of the data.

2. The investigation was further limited to three and four year public high schools in outstate Michigan (outside the city of Detroit). Six year high schools were not included because they are usually quite small schools, and because statistics concerning six year high schools could reflect certain characteristics peculiar to grades seven and eight which would not necessarily be applicable to the upper secondary grades. Private and parochial high schools were not included because statistics concerning these high schools could reflect certain characteristics peculiar to these schools which would not necessarily be applicable to public

high schools. The Detroit public high schools were not included because statistics concerning these schools could reflect certain characteristics peculiar to a large metropolitan school district which would not necessarily be applicable in other areas of Michigan.

CHAPTER II

REVIEW OF RELATED LITERATURE AND RESEARCH

A rather extensive review of related literature and research was conducted to avoid any duplication of research and to extend the scope of this study. As stated in Chapter I, it would be impossible to undertake an examination of all factors influencing the effectiveness of the high school program in a single study. However, by reviewing the related literature and previous studies pertinent to school size, it was possible to extend the scope of this study.

This chapter is divided into five sections. The first section is devoted to a review of some of the many criticisms of the small high school which appear in the literature. The second section is devoted to a review of criticisms of the large high school. The third section is devoted to a review of previous studies pertinent to the size of the high school. The fourth section is devoted to a summary of some of the various size recommendations which have been made for the high school. And the fifth section consists of a summary of the findings from the related literature and research.

I. Criticisms of the Small High School

The National Commission on School District Reorganization paid considerable attention to the size of the high school. They made the following statement in a 1947 report:

> In many . . . districts, high schools are so small that they can offer only skeleton programs. . . . Often it is necessary to assign teachers to work for which they are not prepared. Rarely are these schools good in more than one or two aspects of the program.[5]

The 1958 Yearbook Commission of the American Association of School Administrators listed the following disadvantages of a high school with fewer than 300 students:

1. Costs per student are high for an extremely limited educational program, as many desired subjects cannot be offered, and classes in most subjects are small.

2. The expense makes it hard to employ enough teachers to provide for the proper variety of courses. Most teachers have to teach at least two fields and some subjects have to be taught without proper preparation.

3. It is hard to retain well prepared teachers because they go to schools where they can teach full time in their preferred fields.

4. Administration and supervision are seldom of high quality; salaries are relatively low and the principal often has to spend part time in classroom teaching.

5. If shops, laboratories, and vocational units are provided at all they are very costly in proportion to the plant as a whole and they have to go unused much of the time.

6. Supplemental services such as health and counseling often cannot be offered.

7. The limited educational program sometimes leads to difficulties with the accrediting agencies.[6]

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5. National Commission on School District Reorganization, A Key to Better Education (Washington, D.C.: National Education Association, 1947), pp. 4-5.

6. American Association of School Administrators, 1958 Yearbook Commission, The High School in a Changing World (Washington, D.C.: American Association of School Administrators, Thirty-Sixth Yearbook, 1958), pp. 280-281.

A 1962 survey of the nation's high schools with less than 300 students conducted by the Research Division of the National Education Association revealed that only a little over one-fourth of these small high schools were accredited by a regional accrediting association. The survey also revealed that:

> A large percent of the small high schools do not offer any courses in foreign languages or advanced courses in science and mathematics. When these courses are offered, they are usually limited in the number of semesters of study available or in the frequency of availability.
>
> No foreign language course was offered in 29 percent of these small high schools.
>
> All small high schools offered one or more courses in science, but chemistry was not offered or not always available in 28 percent and physics was not offered or not always available in 40 percent.
>
> All these schools offered one or more courses in mathematics, but trigonometry was not offered or not always available in 68 percent.[7]

Conant made the following indictment against the small high school in his book, The American High School Today:

> The enrollment of many American public high schools is too small to allow a diversified curriculum except at exorbitant expense. The prevalence of such high schools — those with graduating classes of less than one hundred students — constitutes one of the serious obstacles to good secondary education throughout most of the United States. I believe such schools are not in a position to provide a satisfactory educa-

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7. National Education Association, N.E.A. Research Bulletin, Volume 40, Number 1 (Washington, D.C.: Research Division, National Education Association, February, 1962), pp. 56-58.

> tion for any group of their students —the academically talented, the vocationally oriented, or the slow reader. The instructional program is neither sufficiently broad nor sufficiently challenging. A small high school cannot by its very nature offer a comprehensive curriculum. Furthermore, such a school uses uneconomically the time and efforts of administrators, teachers, and specialists, the shortage of whom is a serious national problem.[8]

The Research Division of the National Education Association also noted the inefficient use of teachers' time in small high schools.

> Small high schools by their very nature tend to waste both the time and talents of teachers. In an honest effort to provide a comprehensive program small high schools tend to require more teachers per 100 pupils than larger high schools. A teacher in a small high school who is qualified in a particular subject area is often required to teach other subjects in addition to his field of special competence because there are not enough sections in his subject to make-up a full teaching load for him. Thus a scarce national asset, a teacher's time and talent, may be used inefficiently.[9]

II. Criticisms of the Large High School

Much of the literature pertinent to the size of the high school is critical of the small high school. But, as stated in Chapter I, concern has also been expressed that high schools can be too big as well as too small to provide the best educational opportunities. Herrick listed several

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8. James B. Conant, The American High School Today (New York: McGraw-Hill Book Company, Incorporated, 1959), p. 77.

9. National Education Association, p. 100.

factors, both favorable and unfavorable, that tend to be more prevalent in schools of larger enrollment. He identified the following factors as those which seem to be related to the failure of very large high schools to achieve a high quality of education:

1. The increased difficulty of administration, with the accompanying tendency of the principal to neglect his function as a leader because of preoccupation with operating the machinery.

2. The increased difficulty of unified staff planning and attack upon problems that should be of school-wide concern, i.e. the greater tendency for each teacher or department to operate independently rather than as a part of a school-wide team.

3. The increased tensions and fatigue of teachers in a large school with more activity and noise, more formalization of operating procedures, and more conflicting demands upon their time and energy.

4. The increased difficulty of focusing effective attention upon the problems and needs of the individual pupil, especially in schools where the instruction of a given child is the responsibility of a number of different teachers during the same semester or year.

5. The less favorable psychological reaction of the pupil to the school situation, including the awe or even fright, and the tension of the young child in a very large school, and the misbehavior of the older child whose identity is lost in the mob.[10]

Green cited pupil control, public transportation, and a tendency on the part of school administrators to be less effective as leaders among the more serious problems of very large secondary schools.[11]

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10. Herrick, pp. 91-92.

Anderson and Van Dyke listed the following as criticisms commonly directed toward the very large high school:

1. Teachers tend to know students chiefly as names on a list; the only ones they know well are the very good, the very bad, and the athletes.

2. Most students do not have an opportunity to participate in all-school activities such as varsity athletics, dramatics, band, chorus, school paper, and student council.

3. In order to administer a large school, many rules and regulations are necessary, and very often students are caught unjustly in them.

4. Teachers in different departments do not become well acquainted and frequently compete for students; the result is likely to be an exaggerated compartmentalization of the curriculum.

5. The dropout rate is higher in large schools because of the feeling of anonymity upon the part of the students.[12]

III. Review of Previous Studies

The factor of size has been investigated in many ways in various efforts to find out more about the influence of size on the cost and quality of the high school program. Relatively few studies of the optimum size of the high school have been completed. But many studies have been conducted which examined the relationship between size and per

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11. Arthur S. Green, "Size and the High School," The American School Board Journal (Volume 137, Number 6, December, 1959), p. 19.

12. Anderson and Van Dyke, pp. 93-94.

pupil cost, and between size and one or more qualitative or quantitative factors of secondary education. Some of these studies have been concerned with the relationship of size to the total effectiveness of the high school. While others have been limited to an examination of the relationship between size and only one or two qualitative or quantitative factors of secondary education such as achievement, breadth of educational program, or dropout. Some overlapping is unavoidable, but for purposes of this review the selected studies were classified according to the following outline:

A. Studies of Size and Per Pupil Cost

B. Studies of Size and One or More Qualitative or Quantitative Factors of Secondary Education

1. Achievement
2. Breadth of Educational Program
3. Dropout
4. Qualifications and Assignment of Professional Personnel
5. The Stanford Studies

A. Studies of Size and Per Pupil Cost

The National Commission on School District Reorganization gave considerable attention to the relationship between school size, school finance, and school district organization. They pointed out that:

> Size of school and the cost of education are directly related. In general, the smaller the school the higher the cost per pupil, and the smaller the administrative unit the smaller the schools maintained. Thus the organization of administrative units is closely related to the per pupil cost of education.[13]

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13. National Commission on School District Reorganization, p. 89.

Woodham investigated the relationship between the size of secondary schools, per pupil cost, and the breadth of educational opportunity in the public high schools of Florida. He found that the average cost per pupil decreased as size increased up to an enrollment of 350 pupils and showed little relationship to size beyond that point. He also found a sharp increase in educational opportunity as size increased up to an enrollment of 300 students, with less increase from 300 to 500 and considerable leveling off beyond 550. When he used both cost per pupil and breadth of program and related them in a single cost measure he found a highly significant negative relationship to size of school.[14]

Hammond studied large and small county high schools in Ohio. He found that the larger high schools included a greater variety of subjects in their curriculum and a greater amount of extracurricular activities yet had a lower per capita cost.[15]

The Ohio School Survey Committee released the following findings concerning the economic effect of small high schools:

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14. William Jesse Woodham, Jr., "The Relationship Between the Size of Secondary Schools, the Per Pupil Cost, and the Breadth of Educational Opportunity" (unpublished Doctoral Dissertation, University of Florida, 1951).

15. Granville Sharp Hammond, "A Critical Appraisal of the Ohio County High Schools" (unpublished Doctoral Dissertation, Ohio State University, 1952).

> Small high schools usually cost more per pupil than large high schools. The maintenance of unnecessary small high schools usually results in robbing the elementary school in order to meet accreditation requirements for the high school. In districts with a high school of 101 to 200, the median expenditure per elementary pupil was $130 and per high school pupil $271. In districts with high schools of 501 to 1,000, the median expenditure per elementary pupil was $187 and per high school pupil $253.[16]

Byham made a study of 95 small school districts in Missouri maintaining high schools with a total enrollment of not more than 200 pupils. He concluded that:

> The small school districts in Missouri maintaining high schools are paying a higher cost per pupil for a lower quantity and quality of educational services than are the total number of school districts maintaining high schools in Missouri . . .[17]

Chisholm and Cushman summarized more than twenty studies pertaining to the relationship of size and cost to educational effectiveness. The following statement is quoted from their summary:

> As the size of the school becomes larger, up to certain limits, the quality of its educational program generally becomes more satisfactory and the per capita cost of its educational program generally declines.[18]

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16. Ohio School Survey Committee, Report of the Ohio School Survey Committee (Columbus, Ohio: The Ohio School Survey Committee, 1955), p. 173.

17. Steven H. Byham, "A Study of Certain Small School Districts Maintaining High Schools in Missouri," Dissertation Abstracts, Volume XVI (Ann Arbor, Michigan: University Microfilms, Inc., 1955), pp. 481-482.

18. Leslie L. Chisholm and M. L. Cushman, "The Relationship of Programs of School Finance to the Reorganization of Local School Administrative Units and Local School Centers," Problems and Issues in Public School Finance (New York Bureau of Publications, Teachers College, Columbia University, 1956), p. 104.

Cornell discussed the relationship of high school size to building costs. He pointed out that a larger high school costs less per pupil than a small high school because of better utilization of space. But he also warned that all of the savings in space costs per pupil in large high schools is not always genuine economy.

> . . . A small school must allow "minimum" spaces for such purposes as the auditorium, the gymnasium, and the principal's office which are in the "overhead" category. The principal for example must have, let us say, at least 200 square feet for his office whether he is in a high school of 100 or a high school of 500 pupils. The minimum spaces thus mount up to the small school, reflecting high proportions of the total space budget. Moreover, the small school has difficulties in utilization of its spaces. Small schools must have small classes; for instance, in third-year mathematics or third-year modern languages, and there are not enough sections of special subjects and activities such as science, shop, and music to fully utilize these spaces most every period of the day. . .
>
> The experience of assessing the adequacy of spaces in many schools suggests, however, that a good part of the savings in space costs per pupil in large high schools is not genuine economy. What often happens is that the larger schools are made larger by adding more standard classrooms without adequately providing comparable auxiliary spaces.[19]

Conant made the following statement pertaining to the relationship between the size of the high school and cost in his book, The American High School Today:

> Financial considerations restrict the course offerings of the small high school. As the curriculum is narrowed, so is the opportunity for

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19. F. G. Cornell, "High School Size and Building Costs," American School Board Journal (January, 1957), p. 40.

> a meaningful program. Unless a graduating class contains at least one hundred students, classes in advanced subjects and separate sections within all classes become impossible except with extravagantly high costs.[20]

Osburn conducted a study which was designed to determine the effect of expenditure per pupil and size of school on the quality of education in secondary schools in Mississippi. He found that both the expenditure per pupil and the size of the school had a significant effect on the quality of education. He stated that the evidence supported the hypothesis that the relationship between expenditure per pupil and quality of education increases with size of school held constant; and the relationship between size of school and the quality of education increases with expenditure per pupil held constant.[21]

B. Studies of Size and One or More Qualitative or Quantitative Factors of Secondary Education

1. Achievement

Most of the studies which have attempted to determine if there is a significant relationship between the size of the high school and achievement have used success in college as a measure of achievement. One of the earlier studies of this type was conducted in Michigan by Ruth Brown. She in-

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20. Conant, p. 77.

21. Morris Osburn, "The Effect of Expenditure Per Pupil and Size of School on the Quality of Education in the Secondary Schools in Mississippi" (unpublished Doctoral Dissertation, University of Southern Mississippi, 1962).

vestigated the relationship between the first semester average grades of college freshmen and the size of their high school graduating class. Her sample included freshmen entering twenty colleges and universities in Michigan in the fall of 1928. The high school graduating classes were divided into size intervals of 0-24, 25-49, . . . 200-224, and over 225. She concluded that:

> There is a general tendency for students from larger high schools to obtain somewhat better first semester grades, but this trend is not consistent between high schools of various sizes unless they are grouped roughly into three divisions: small, medium, and large.[22]

Ten years later, however, Dwyer stated that no one has established the existence of a relationship between the academic success of students in college and size of high school which is definite enough to serve as a basis of individual prediction.[23] And in 1949, Garrett in a review and interpretation of investigations of factors related to college success stated that:

> The size of high school from which students graduated apparently has no effect on their college grades, although some studies showed a slight tendency for students from smaller high schools to receive somewhat lower averages.[24]

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22. Ruth A. Brown, "A Study of High School and First Semester College Records of Freshmen Entering Twenty Colleges and Universities in Michigan in the Fall of 1928," Journal of the Michigan Schoolmasters' Club (1930).

23. P. S. Dwyer, "Some Suggestions Concerning the Relationship Existing Between Size of High School Attended and Success in College," Journal of Educational Research (Volume 32, December, 1938), pp. 271-278.

24. Harley F. Garrett, "A Review and Interpretation of Investigations of Factors Related to Scholastic Success in Colleges of Arts and Sciences and Teachers Colleges," Journal of Experimental Education (Volume 17, December, 1949), pp. 91-138.

Numerous investigations of the relationship between college grades and the size of the high school from which students graduated have been completed since Garrett[25] made his review. Many of these studies have tended to support the hypothesis that there is no significant relationship between the size of the high school from which a student graduated and success in college. But some writers have reported that in their studies, size did seem to make a difference. A representative sample of both types of reports was selected for the following review.

Ledbetter and Watson conducted a study in California which included data gathered over a period of twenty years of grade averages at the campuses of the University of California. The results indicated that there were no significant differences in the academic quality of students from large or small high schools enrolled at the University. The authors concluded that the academic program of small high schools adequately prepares students for study at the University.[26]

Bertrand studied the relationship between enrollment of high schools from which students graduated and the academic achievement of agricultural students at A. and M. College of

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25. Ibid.

26. Victor Ledbetter and Bruce Watson, "Are Small Schools Necessary," Journal of the California Teachers Association (Volume 51, March, 1955), pp. 30-31.

Texas. He found that when the effect of aptitude was controlled there appeared to be no consistent trend which would make it possible to use size of high school as a basis for predicting scholastic success in college. He did find, however, that the enrollment of the high school was directly related to aptitude as measured by the American Council on Education Psychological Examinations.[27]

Shaffer analyzed certain factors in the high school preparation of Iowa high school graduates entering selected Iowa colleges. Using college grade point obtained, he concluded that the size of the high school attended was not a determining factor for the student who achieves scholastic success in the first year of college.[28] Bordes used size as one factor in his study of student achievement in college chemistry. He found no effect of size of high school.[29]

Altman conducted a study at Central Michigan College which included an analysis of college point average and high school size. Seniors who had entered Central Michigan Col-

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27. John R. Bertrand, "Relation Between Enrollment of High Schools from Which Students Graduated and Academic Achievement of Agricultural Students, A. and M. College of Texas," Journal of Experimental Education (Volume 25, September, 1956), pp. 59-69.

28. Dwight T. Shaffer, "Analysis of Certain Factors in the High School Preparation of Iowa High School Graduates Entering Selected Iowa Colleges" (unpublished Doctoral Dissertation, State University of Iowa, 1956).

29. Carl W. Bordes, "Factors Related to Success in Freshmen Chemistry at the State University of Pennsylvania" (unpublished Doctoral Dissertation, State University of Pennsylvania, 1957).

lege as freshmen in September, 1953 and who were graduated in June, 1957 constituted the group on which the study was made. Of the 638 who entered as freshmen, 144 continued their college work for seven consecutive semesters, had not been on academic probation, had come directly from high school and were therefore about the same chronological age. She reported that in the group studied, graduates of the larger high schools did not achieve significantly higher point averages than did the graduates of the smaller high schools.[30]

Dickerson made an analysis of the relationship of size of Arkansas high schools to the academic success of graduates in the first year at the University of Arkansas. He found that students from the small high schools tended to withdraw from the University at a higher rate than those from large high schools. And he also reported that students coming to the University from the large public high schools of the state had significantly greater scholastic ability than those from the small high schools. But he stated further that:

> When mental ability is held constant, the size of the preparatory high school seems to have very little if any influence on the academic achievement of the student once he reaches college.[31]

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30. Esther Royal Altman, "The Effect of Rank in Class and Size of High School on the Academic Achievement of Central Michigan College Senior Class of 1957," Journal of Educational Research (Volume 52, Number 8, April, 1959), pp. 307-309.

31. Elbert Lee Dickerson, "An Analysis of the Relationship of Size of Arkansas High School to Academic Success of Graduates in the First Year at the University," Dissertation Abstracts, Volume XIX (Ann Arbor, Michigan: University Microfilms, Inc., 1958), pp. 475-476.

Young compared the academic preparation and achievement of college students from various size high schools in Indiana. He reported that when scholastic aptitude is held constant there is no significant relationship between high school size and success in college.[32] Borsuk compared certain characteristics of persisting and non-persisting students at the University of Wisconsin. He reported that the size of the student's high school graduating class had no relation to persistence or non-persistence.[33]

Laughlin studied college first semester academic achievement at Pennsylvania State University as related to certain characteristics of a high school graduating class. He reported that the size of the high school graduating class as a predictor of college grade point at Pennsylvania State University is of little or no significance.[34] Staton also studied the relationship of selected factors to academic success for beginning college freshmen. He too, reported that the size of the high school from which a student graduated did not affect success in college.[35]

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32. John Frederick Young, "A Comparison of the Academic Preparation and Achievement of College Students from Various Size High Schools in Indiana" (unpublished Doctoral Dissertation, Purdue University, 1958).

33. Charles Seymour Borsuk, "A Comparative Study of Persisting and Non-Persisting Students at the University of Wisconsin" (unpublished Doctoral Dissertation, The University of Wisconsin, 1959).

34. James Walton Laughlin, "College First Semester Academic Achievement as Related to Characteristics of a High School Graduating Class" (unpublished Doctoral Dissertation, The Pennsylvania State University, 1961).

In contrast to the preceeding studies; which generally indicated that there is is not any significant relationship between the size of the high school from which a student graduated and success in college; the following studies would seem to indicate that such a relationship does exist.

Kramer studied high school class rank and academic performance in college. He summarized his findings as follows:

> Graduates from secondary schools seem to perform better academically in college when the secondary school from which the student graduated (a) has a large graduating class, (b) has a high per pupil expenditure rate, and (c) serves a residential or high income community.[36]

Mallory studied the extent to which several factors may have contributed to the success or failure of selected Missouri high school graduates as University of Missouri freshmen. One of his conclusions was that:

> For the pupils considered in this study there appears to be a positive relationship between success at the University of Missouri and the number in the high school graduating class for pupils whose graduating class enrolled 100 or more.[37]

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35. Jon Tom Staton, "The Relationship of Selected Factors to Academic Success for Beginning Freshmen" (unpublished Doctoral Dissertation, The University of Oklahoma, 1962).

36. George Albert Kramer, "High School Class Rank and Academic Performance in College," Dissertation Abstracts, Volume XX (Ann Arbor, Michigan: University Microfilms, Inc., 1958), pp. 3575-3576.

37. Arthur Lee Mallory, "A Study of the Extent to Which Several Factors May Have Contributed to the Success or Failure of Selected Missouri High School Graduates as University of Missouri Freshmen," Dissertation Abstracts, Volume XX (Ann Arbor, Michigan: University Microfilms, Inc., 1960), pp. 3599-3600.

Sterrett investigated several factors in the background of a select group of Arkansas college freshmen in relation to their continuation or withdrawal from college. One of the factors which he investigated was related to school size. He found that students who tended to continue their college education had graduated from schools of 500 or more enrollment and that students who tended to withdraw from college had graduated from a high school with fewer than 500 enrollment.[38]

Weaver investigated the influence of size on the quality of the high school in the state of North Carolina. He found that (1) graduates of large high schools earn, on an average more college credit hours from freshman through senior year than graduates of small high schools; (2) graduates of small high schools earn, on an average, less college quality points from freshman through senior year than graduates of large high schools; and (3) graduates of large high schools are less prone to fail either to graduate from college or to earn promotion to the next succeeding class than graduates of small high schools.[39]

Long used the size of the high school graduating class as one factor in his study of the academic success of under-

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38. Marvin Dean Sterrett, "Continuation and Withdrawal in a Select Group of Arkansas College Freshmen" (unpublished Doctoral Dissertation, George Peabody College for Teachers, 1960).

39. Charles Horace Weaver, "An Investigation of the Influence of Size on the Quality of the High School" (unpublished Doctoral Dissertation, The University of North Carolina, 1961).

graduate students at the University of Southern Mississippi. He reported that a higher mean was generally achieved by students from high school graduating classes of over one hundred. And that students from high school graduating classes of less than 100 were the highest in rate of mortality.[40]

As stated previously in this chapter, most of the studies which have attempted to determine if there is a significant relationship between the size of the high school and achievement have used success in college as a measure of achievement. However, there have been a few studies which have used standardized test scores as a measure of achievement.

Gray studied the relationship between size and a number of qualitative and quantitative factors of education in four sizes of secondary schools in Iowa. His sample included forty Iowa public secondary schools, all of which had administered the Iowa Tests of Educational Development in the school year 1956-1957 and again in the school year 1958-1959. The forty schools were divided into four enrollment groups, each containing ten schools.

A schools	1000 and above
B schools	400-999
C schools	150-399
D schools	0-149

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40. Herbert Eugene Long, "A Study of Selected Factors Related to the Academic Success of Undergraduate Students at the University of Southern Mississippi" (unpublished Doctoral Dissertation, University of Southern Mississippi, 1962).

He found small differences favoring the larger schools in standard score units on the ITED; both when the measure used for student achievement was the gain in standard score units between tenth grade and twelfth grade, and when the measure used for student achievement was the highest standard score reached on the twelfth grade composite. But these differences were not found to be statistically significant. He concluded that for his study:

> . . . size of high school graduated from is not an important factor in college grade point earned or in growth as measured by the ITED. The results show, however, that the D group schools were the lowest on these measures of achievement.[41]

Jantze studied the relationship of accreditation, finance, and size of Nebraska high schools to scholastic achievement. He also used scores from the Iowa Tests of Educational Development as a measure of achievement. Differences in native ability of students were controlled by the results of aptitude tests which they had taken in their respective schools. His sample included forty-six secondary schools in the state of Nebraska which had administered the ITED tests in the spring of 1959. He reported that: "scholastic achievement in the basic school subjects, within the limits of the sample, increases as enrollment increases up to a point, somewhere between an enrollment of 400-799, and then decreases."[42]

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41. Stuart Calvin Gray, "A Study of the Relationship Between Size and a Number of Qualitative and Quantitative Factors of Education in Four Sizes of Secondary Schools in Iowa" (unpublished Doctoral Dissertation, State University of Iowa, 1961), p. 122.

Smith studied the relationship between the size of Arkansas high schools and the achievement of their college bound seniors as measured by the American College Test in mathematics, natural science, social studies, and English. Some of his conclusions are quoted below:

1. Arkansas high schools of four hundred or more are graduating college-bound seniors who achieve at a significantly higher level in total educational development than are smaller high schools.

2. Arkansas high schools of six hundred or more are graduating college-bound seniors who achieve at a significantly higher level in mathematics and science than are smaller high schools.

3. Arkansas high schools of four hundred or more are graduating college-bound seniors who achieve at a significantly higher level in social studies and English than are smaller high schools.[43]

2. Breadth of Educational Program

Many of the studies pertinent to the relationship between the size of the high school and the breadth of educational program have also been concerned with per pupil cost or some other qualitative or quantitative factors of secondary education. Thus some of them have been reviewed previously in this chapter.

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42. Ralph Dale Jantze, "An Analysis of the Relationship of Accreditation, Finance, and Size of Nebraska High Schools to Scholastic Achievement" (unpublished Doctoral Dissertation, University of Nebraska, 1961), p. 51.

43. Fay Windel Smith, "An Analysis of the Relationship of Size of Arkansas High Schools and the Achievement of College-Bound Seniors," Dissertation Abstracts, Volume XXI (Ann Arbor, Michigan: University Microfilms, Inc., 1961), pp. 3332-3333.

Herrick listed the following factor as one of the favorable factors that tend to be more prevalent in schools of larger enrollment:

> Greater variety of courses offered with more frequency and regularity and with greater adaptation of content and method to the varying abilities of different groups of pupils.[44]

Gray found a positive relationship between size of school and the number of units of educational opportunity available among the four size groups of Iowa schools which he studied.[45] And Weaver concluded from his studies in North Carolina that: "large high schools offer a more varied program of study than small high schools."[46]

3. Dropout

Myers studied factors and practices related to holding power in Michigan secondary schools. He found a significant negative relationship between holding power and size of school enrollment, tenure of school superintendent, and percentage of Negroes and other non-whites in the community.[47] The Michigan Committee on School Holding Power also reported that larger high schools in Michigan have a higher rate of dropout. They stated that:

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44. Herrick, p. 91.

45. Gray, p. 101-105.

46. Weaver, op. cit.

47. George Raymond Myers, "A Study of Factors and Practices Related to Holding Power in Certain Michigan Secondary Schools" (unpublished Doctoral Dissertation, Michigan State University, 1956).

> We do know that the size of a community and the size of the school makes a difference in Michigan. Larger, more industrial communities tend to have higher drop-out rates than smaller communities in Michigan.[48]

Hayes studied the relationship of certain school factors to the holding power of selected Iowa secondary schools. He found that the smaller schools (less than 250 students in grades 9 - 12) had generally superior holding power. However, he also reported that observations excerpted from the rating system employed by various accrediting agencies showed that most schools of the smaller size groups were below the "good" standard. He stated that:

> It would appear then that a school may not be judged by its holding power . . . if indeed the school is the institution or force operating to influence holding power.[49]

All of the preceeding studies have indicated that larger high schools tend to have a higher rate of dropout than small high schools. And, as noted previously in this chapter, a higher dropout rate was one of the criticisms of the large high school listed by Anderson and Van Dyke. They stated that: "The dropout rate is higher in large schools in large cities, in some degree because of the feeling of anonymity upon the part of students."[50] However, Weaver

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48. Michigan Committee on School Holding Power, "Questions and Answers about School Drop-Outs" (Lansing, Michigan: Department of Public Instruction, Circular Number 47, 1963).

49. James E. Hayes, "The Relationship of Certain School Factors to the Holding Power of Selected Iowa Secondary Schools," Dissertation Abstracts, Volume XIX (Ann Arbor, Michigan: University Microfilms, Inc., 1958), pp. 469-470.

50. Anderson and Van Dyke, p. 94.

found dropout percentages higher in small schools than in large high schools in North Carolina. He reported that:

> The holding power of large high schools of the state is considerably greater than that of small high schools; that is, a much larger percentage of the students in the large high schools complete their work and graduate.[51]

Cook also reported that in Arkansas, larger high schools have lower dropout rates than small high schools.[52]

4. Qualifications and Assignment of Professional Personnel

In a study of secondary schools in Pennsylvania, Connoley found that there was no apparent relationship between size of school and teacher load except for small schools which enroll less than 100 students.[53] Davis made a study of objective differences existing in small and large high schools in North Carolina. Two of the areas which he studied were quality of teacher personnel and teacher load. He reported that the staffs of the larger high schools had superior professional qualifications. He found that the ratio of students per teacher was slightly smaller in small schools.

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51. Weaver, p. 104.

52. Kenneth Oscar Cook, "The Relationship Between Certain School Practices and Dropout Rates of the High Schools of Arkansas" (unpublished Doctoral Dissertation, North Texas State University, 1963).

53. John Vincen Connoley, "A Study of the Changes in Educational Opportunities Provided for Secondary School Students by Joint School Systems of Pennsylvania" (unpublished Doctoral Dissertation, University of Pittsburgh, 1956).

However, he found that teacher load was greater in the small high schools.[54]

Torrance made the following remarks about the qualifications of mathematics and science teachers based on a survey conducted by the Bureau of Educational Research of the University of Minnesota:

> . . . Compared with larger schools, mathematics and science positions are more difficult to fill; teachers are younger and less experienced, teachers have less training, teachers spend less time in keeping up with science developments, and small schools are doing less to stimulate interest in science.[55]

Barnard studied the relationship of school size and accreditation to certain factors in secondary schools in Alabama. He found that the percentage of teachers with a major or minor in their teaching field increased with the size of the school. However, he concluded from his studies that the academic training of teachers in their teaching field was related more to the factor, accreditation, than to the factor, size.[56]

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54. Elwood Dale Davis, "A Study of Objective Differences Existing in Small and Large Union Schools in North Carolina" (unpublished Doctoral Dissertation, The University of North Carolina, 1953).

55. Paul E. Torrance, "Small High Schools and the Improvement of Mathematics and Science Programs," Educational Administration and Supervision (Volume 45, May, 1959), pp. 127-134.

56. Harry Vollie Barnard, "The Relationship of School Size to Certain Factors in Alabama's White Public Accredited Six-Year Secondary Schools" (unpublished Doctoral Dissertation, University of Alabama, 1959).

Collingsworth studied the relationship between the size of Arkansas high schools and the qualifications of the high school teachers. He classified the schools according to size as follows:

Very Small	150 or less
Small	200-399
Medium	400-599
Large	600-799
Very Large	800 or more

He reported the following findings:

1. A significant difference was found among the various size schools in regard to the number of teachers holding emergency certificates. In general, as the size of the school increased the relative number of emergency teachers decreased.

2. The relative number of teachers with advanced degrees increased with the size of the school. The difference among the schools in regard to this factor was significant at the one percent level of confidence.

3. The percentage of teachers instructing outside their field of preparation decreased as the size of school increased. The increase was statistically significant.

4. There was no significant difference in the number of classes taught outside of teaching field. The mean number increased with the size of school.

5. There was no significant difference in the total years of teaching experience. However, a larger percentage of the teachers in the very small and small schools had less than five years of teaching experience than did teachers in the medium, large, and very large schools.[57]

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57. B. Jack Collingsworth, "An Analysis of the Relation of Size of Arkansas High Schools to Selected Qualifications of the High School Teaching Personnel," Dissertation Abstracts, Volume XXI (Ann Arbor, Michigan: University Microfilms Inc., 1961), p. 3320.

Gray found that there was a significantly larger turnover of staff in small high schools in Iowa, and a significantly smaller number of teachers teaching in their major fields of preparation. He did not find any significant difference in the number of periods taught per day by teachers among the four size groups in his study.[58]

Weaver also found a higher turnover of teachers in the small high schools in North Carolina and a higher percentage of teachers teaching out of their major field of preparation.[59]

Schloerke studied the formal preparation and course assignments of secondary school teachers within large Michigan high schools. His sample included 33 Michigan high schools with enrollments of more than 500 students. The schools were classified according to size as follows:

Enrollment	Number of Schools
500- 999	10
1000-1499	5
1500-1999	5
2000-2499	5
2500-2999	5
3000 and up	3

He found noticeable increases in the formal preparation of teachers up to, and including, the 1500-1999 enrollment range. But he cautioned about generalizations with respect to the data because the differences in percentage, by school size, were small enough to suggest that the preparation of teachers does not necessarily vary greatly according to

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58. Gray, pp. 122-123.

59. Weaver, pp. 110-112.

school size, and that size may be only a minor factor in determining the degree of teacher preparation.

Schloerke found that the assignment of teachers to subject matter of their greatest strength increased up to the 2000-2499 enrollment range. However, as in the case of teacher preparation, he cautioned that the percentage differences were again small enough to suggest the possibility that size may be only a minor factor in determining the assignment of teachers to their areas of greatest preparation.[60]

5. The Stanford Studies

Four cooperative studies were undertaken at Stanford University to determine the relationship of high school size to curricular offering, guidance, staff relations, and school-community relations. All four studies used the same sample which consisted of seventeen four year high schools in the Bay Area of California. The schools were divided into four categories according to enrollment: 800 to 1199, 1200 to 1599, 1600 to 1999, and 2000 and above.

Woods studied the curricular offering, including the activity program. He reported the following results:

> No consistent relationship emerged between size of high school and any of the following factors: availability of curricular offering,

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60. Charles William Schloerke, "The Formal Preparation and Course Assignments of Secondary School Teachers Within Large Michigan High Schools" (unpublished Doctoral Dissertation, University of Michigan, 1964), pp. 104-105.

parental participation in the student activity program, and student reaction to the activity program.

The smallest size high schools in the enrollment range of 800 to 1199 tended to

1) be less effective in communicating with parents and students concerning the curricular offering
2) provide fewer materials of instruction
3) make less provision for curricular development
4) be less efficient in organizing and administering the activity program.

The most favorable parental reaction to the curricular offering was found in schools in the 1200 to 1599 enrollment range. The differences were consistent and in most cases significant at the five percent level or better.[61]

He observed that:

Within the limits of the data gathered in this study, the argument that larger schools tend to lose sight of the individual needs of youth and deny to many the opportunity to participate in student activities do not seem to be valid.[62]

Bush studied the guidance program. He reported that there was no consistent pattern of significant differences that could be related to any one size category of school for the total guidance program, but schools of 1200 to 1599 and those above 2000 were favored for specific purposes by the respondents to his survey. He concluded that: "The lack of internal consistency for the category is a clue that factors

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61. Thomas Edward Woods, "Relationship of High School Size to Curricular Offering," Dissertation Abstracts, Volume XVIII (Ann Arbor, Michigan: University Microfilms, Inc., 1958), pp. 431-432.

62. Ibid.

other than size are important in determining the effectiveness of the school guidance program."[63]

Shapiro studied staff relations. His study was designed to determine if there were any relationships between size of the high school and six factors related to staff relations. These six factors were communications, group cooperation, teacher effectiveness, staff participation, supervision, and teacher load and routines. He reported the following results:

1. Communications were more effective in smaller schools than in the larger schools.

2. More effective group cooperation was evidenced in smaller schools than in larger schools.

3. The individual members of the staff performed more effectively in the smaller schools than in the larger schools.

4. There was very little difference, if any, in the actual staff participation in the administration of the schools, in all of the various sized schools.

5. Supervision was more effective in the schools with enrollments between 1200 and 1600 than in the other three size categories.

6. There was little difference in the reports of the average total hours spent on the job, between staff of smaller or larger sized schools. However, the kinds of activities assigned staff members of smaller schools were more meaningful to them than were those assigned to staff members in the larger schools.[64]

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63. Robert Curtis Bush, "Relationship of High School Size to the Guidance Program," Dissertation Abstracts, Volume XX (Ann Arbor, Michigan: University Microfilms, Inc., 1959), pp. 1238-1239.

64. David Franklin Shapiro, "Relationship of School Size to Staff Relations," Dissertation Abstracts, Volume XVIII (Ann Arbor, Michigan: University Microfilms, Inc., 1958), p. 1324.

Shapiro made the following conclusions based on his study:

> Based on the limited scope and sample of this study, the optimum size school for staff relations is one with an enrollment between 1200 and 1600. However, the conditions favoring staff relations in one size high school over another are not great enough to warrant major sacrifices in achieving a specific size.[65]

Andrews studied school-community relations. His study was designed to determine if there were any relationships between size of high school and four areas related to school-community relations. These four areas were:

1. Understanding by the clientele of the program and purposes of the school
2. Extent of the individualized attention given by the school to the clientele, and the close personal relationship that exists between school and clientele
3. Participation of the clientele in school affairs
4. Evaluation of the school program and purposes by its clientele

He reported the following results:

1. Parents were slightly better informed about the program and purposes in the smaller schools.
2. Students in the larger schools were as well informed, and understood the schools' program and purposes just as well as the students in the smaller schools.
3. Administrators of various sized schools informed their clientele of the program and purposes of their school to the same degree.
4. Smaller schools had a better parent-school relationship than did the larger schools.

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65. Ibid.

5. Administrators indicated a better parent-school relationship in smaller schools than in larger schools.

6. Smaller schools did a less adequate job of providing for student participation in class planning and communications with parents.

7. Participation of parents in school affairs appears greater in the smaller size categories.

8. Larger schools do at least as well as the smaller schools in providing student participation in school affairs.

9. Larger schools offer a more comprehensive program, but some smaller schools do as well as some of the larger schools in creating favorable relations of social experience, and participation in school activities.[66]

Andrews stated that:

> The evidence, based on the scope and sample of this study, shows the optimum size high school in terms of school-community relations to be one with an enrollment between 1200 and 1599 student population.[67]

However, he stated further: "The data from this study were not conclusive enough to warrant the recommendation of any one size school in preference to another."[68]

It should be noted that the sample used in the Stanford studies did not include any high schools with an enrollment of less than 800 students. This may account for some of the

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66. Lloyd Nelson Andrews, "Relationship of High School Size to School Community Relations," Dissertation Abstracts, Volume XIX (Ann Arbor, Michigan: University Microfilms, Inc., 1958), p. 707.

67. Ibid.

68. Ibid.

differences between the findings of these studies and the findings of some other studies that were concerned with some of the same factors, but used samples that included much smaller schools. For example, Bush[69] reported that he did not find any consistent pattern of significant differences between the guidance programs in various size high schools; while both Gray[70] and Weaver[71] reported that large schools had a more extensive guidance program than small schools. And Woods[72] reported that he did not find any consistent relationship between the size of the high school and student reaction to the activity program. While Gray[73] reported that student participation in the activity program was higher in the B (400-999) and C (150-399) schools than in the A (1000 and above) and D (0-149) schools, and that the students in the A schools valued their participation less than the students in any of the other groups.

IV. Size Recommendations for the High School

This section of this chapter is devoted to a summary of some of the various size recommendations which have been

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69. Bush, loc. cit.

70. Gray, p. 116.

71. Weaver, op. cit.

72. Woods, loc. cit.

73. Gray, pp. 123-124.

made for the high school. The summary is divided into three parts: minimum size recommendations, maximum size recommendations, and optimum size recommendations.

A. Minimum Size Recommendations

Fitzwater found the recommended minimum for four year high schools in Minnesota and South Dakota to be 100 students; Illinois and Wisconsin, 350; and Pennsylvania, 450.[74] An absolute minimum enrollment probably cannot be established which would be equally appropriate for all sections of the country; or for some states, even all school districts within the state; because of differences in geography, distribution of population, transportation problems, and many other factors. But the literature does provide some guidelines on minimum size. Recommended minimum enrollments vary considerably, as the following excerpts from the literature will show, but they tend to center around an enrollment range from 300 to 500 students.

The National Commission on School District Reorganization recommended a minimum of 75 pupils for each grade or 300 for a four year high school.[75] A United States Office of Education report also recommended 300.[76]

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74. C. O. Fitzwater, School District Reorganization - Policies and Procedures (Washington, D.C.: United States Department of Health, Education, and Welfare, U.S. Office of Education Special Series Number 5, 1957), p. 53.

75. National Commission on School District Reorganization, Your School District (Washington, D.C.: National Education Association, 1948), p. 81.

76. Walter H. Gaumitz and Ellsworth Tompkins, How Large Are Our Public High Schools? (Washington, D.C.: United States Department of Health, Education, and Welfare, U.S. Office of Education Circular Number 364, 1959), p. 15.

Chisholm and Cushman made the following statement pertinent to minimum size:

> The per capita cost of education and the quality of the educational program are generally considered unsatisfactory in high school attendance units having fewer than 250-300 pupils except as cost is greatly increased.[77]

Smith studied various size high schools in Ohio. He reported that: ". . . schools with enrollments of less than 200-400 pupils are paying a premium for an inferior program."[78] Ross, in his capacity as editor of the source book, Administration for Adaptability, made the following statement concerning minimum size:

> The quality of education of a district is probably poorer than it should be, considering cost and environmental factors, if it has fewer than 500 pupils in grades 7 to 12.[79]

Woodham made the following recommendations pertaining to the minimum size of the high school:

> If the adequacy of school size is based upon cost per pupil per unit of opportunity, the minimum size necessary for six year schools to provide a broad program at a reasonable cost is 500 pupils. A more desirable minimum is 750 pupils.[80]

A six year high school of 500 students would have approximately 300 students in grades 9 to 12. A six year high

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77. Chisholm and Cushman, p. 104.

78. Clifford Basil Smith, "A Study of the Optimum Size of Secondary Schools" (unpublished Doctoral Dissertation, Ohio State University, 1960), p. 146.

79. Donald H. Ross, Editor, Administration for Adaptability (New York: Metropolitan School Study Council, 1958), p. 182.

80. Woodham, op. cit.

school of 750 students which Woodham[31] states would be a more desirable minimum, would have approximately 500 students in grades 9 to 12. This is about the same minimum recommended by Conant.[32] He recommended a minimum of 100 in the graduating class. This would require an enrollment of about 450 in grades 9 to 12.

B. Maximum Size Recommendations

Much less has been written about the maximum size of the high school than about minimum size. Thus there are fewer recommendations on which to base any conclusions about maximum size. The maximum size recommendations which have been made, however, tend to center around an enrollment range from 1500 to 2200 students for a four year high school.

The Citizens Advisory Committee on School Needs in Detroit recommended that future senior high schools in Detroit should be built to accomodate from 1700 to 2000 students. (They recommended that future elementary schools should range in size from 600 to 800 students and junior high schools from 1000 to 1200 students.) The committee gave the following reasons for their recommendations:

> Analysis of school sizes outside of Detroit indicates a recent trend to construct schools in smaller units than has been the recent practice in Detroit. There is also considerable evidence that these school sizes represent a point of diminishing returns beyond which no substantial savings are to be realized either in original cost or administration.[33]

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31. Ibid.

32. Conant, p. 77.

Benjamin C. Willis, Superintendent of Schools in Chicago, stated that as they designed for new general high schools in Chicago they planned for an enrollment between 2000 and a maximum capacity of 2200. He gave the following reasons for this recommendation:

> It is our conviction that for these type of schools, any larger enrollment will not permit the general academic education that we should like to see operating.
>
> Within this range in the community served, there is room for flexibility in programming. We can provide a solid program for the gifted while taking care of the average and those who seek training in business education.
>
> This size student body makes possible a wide range of club and extracurricular activities that provide many opportunities for varied types of personalities. It is not so large that the student finds himself lost.[84]

Ross made the following statement concerning maximum size:

> The quality of education of a district is probably poorer than it should be, considering cost and environmental factors, if it has more than 3000 students in grades 7 to 12.[85]

A six year high school of 3000 students would have approximately 2000 students in grades 9 to 12.

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83. George Romney, Chairman, and Edward L. Cushman, Vice Chairman, Findings and Recommendations of the City-Wide Citizens Advisory Committee on School Needs (Detroit, Michigan: The Board of Education of the City of Detroit, November, 1958), p. 199.

84. Benjamin C. Willis, "How Big is Too Big," NEA Journal (Volume 47, Number 4, April, 1958), pp. 235-236.

85. Ross, p. 182.

Anderson and Van Dyke made the following statement pertaining to maximum size:

> The case for the limit on the maximum size of a secondary school is not convincing on the basis of available studies comparing costs, student achievement, staff relations, and other factors. Nevertheless, they do show some disadvantages for large schools as enrollments exceed the 1,500 to 2,000 range.[86]

Schloerke made the following recommendation:

> It is recommended that additional school plants be established in communities when enrollments within the existing secondary schools reach approximately 2,000 pupils. This recommendation is based solely upon one aspect related to school size, namely the formal preparation and course assignments of teachers currently within Michigan secondary schools of varying enrollments . . . This study has indicated particular school enrollments beyond which size no longer can be considered advantageous in regard to teachers, their formal preparation and their subsequent course assignments.[87]

C. Optimum Size Recommendations

It would seem logical to assume that if high schools can be too big as well as too small that there must be a middle range, an optimum size range, which combines the advantages of large and small schools. One of the reasons for undertaking this study, however, as stated in Chapter I was because there did not seem to be any unanimity of opinion on a particular size for the high school which tends to provide the best educational opportunities at a reasonable cost per pupil. Alexander and Saylor suggested that we have no conclusive evidence as to what the desirable size for the

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86. Anderson and Van Dyke, p. 94.

87. Schloerke, p. 106.

secondary school is.[88] And the 1958 Yearbook Commission of the American Association of School Administrators cited the question of optimum size for secondary schools as one which needed further inquiry.[89]

A review of the literature pertinent to optimum size reveals that the various sizes for the high school which have been recommended as optimum are so divergent they overlap both minimum and maximum recommendations. Oliver reported on the opinion of 37 nationally known writers on secondary education and 72 secondary school administrators. He reported a size preference from 200 to 1500 with the "golden mean" set at 500. He stated:

> In a school of this size the individual will have opportunity to remain an individual personality and at the same time be presented with an enriched program of educational and social opportunity.[90]

Mack made the following statement concerning optimum size:

> The optimum size of a high school is probably about 800 pupils. A smaller high school may mean ineffiency in program and classes, and a very much larger high school borders on the "factory method" of education.[91]

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88. William M. Alexander and Galen T. Saylor, Secondary Education (New York: Rinehart and Company, Inc., 1955), p. 197.

89. American Association of School Administrators, 1958 Yearbook Commission, p. 337.

90. Oliver, p. 128.

91. Russell A. Mack, "Union or Regional High Schools," The Bulletin (The National Association of Secondary School Administrators, Volume 34, Number 167, January, 1950).

Green recommended a much larger high school than the two previous writers. He stated that:

> Realistically, a high school whose total enrollment is between 1200 and 1800 is the type that is becoming increasingly popular through experience with both the educators and the public.[92]

Kowitz and Sayres conducted a study which was designed to determine an optimal size range for six year high schools in the state of New York. The major variables selected for study were size, cost, and certain other factors assumed to effect the educational opportunity available. They reported that:

> . . . The most economical size for the secondary school would seem to be between 600 and 800 pupils. In this interval, also, the indices of educational opportunity showed generally to greatest advantage relative to cost.[93]

Smith conducted a study which was designed to determine an optimal size range for three and four year high schools in Ohio. His recommendation for three and four year high schools is larger than the recommendation Kowitz and Sayre[94] made for a six year high school. He stated that:

> . . . the cost and program advantages of a majority of the factors increase as school size increases to the 800 - 1,200 size range

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92. Green, pp. 19-20.

93. Gerald T. Kowitz and William C. Sayres. Size, Cost, and Educational Opportunity in Secondary Schools (New York: The University of the State of New York, the State Education Department, Division of Research, May, 1959), p. 71.

94. Ibid.

> after which little, if anything, is gained and disadvantages on most factors begin to appear. Therefore, it is concluded that the optimal size range for three-and four-year secondary schools in Ohio is 800 to 1,200 pupils.[95]

V. Summary of Findings from the Literature

1. Much of the literature is critical of the small high school, but concern has also been expressed that high schools can be too big as well as too small to provide the best educational opportunities.

2. A definite relationship has not been established between size of high school and achievement of students. Some writers report that graduates of large high schools tend to achieve higher grades in college than graduates of small high schools. But other writers report that when aptitude is held constant there does not seem to be any significant relationship between size of high school and achievement of graduates. Most studies that have investigated the relationship between size of high school and achievement of students have used success in college as a measure of achievement.

3. A definite relationship has not been established between size of high school and and dropout. Some writers report that larger high schools have a higher rate of dropout. But other writers report that larger high schools have a lower rate of dropout.

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95. Clifford Basil Smith. p. 146.

4. Teachers in large high schools are generally better qualified professionally to teach the subjects to which they are assigned.

5. Recommended minimum enrollments tend to center around an enrollment range from 300 to 500 students for a four year high school. Schools below 300 enrollment are paying a premium for an inferior program.

6. Much less has been written about maximum size for the high school than about minimum size. However, the recommendations for maximum enrollment that have been made tend to center around an enrollment range from 1500 to 2200 for a four year high school.

7. Few studies have been made to determine an optimum size for the high school. And there does not seem to be any unanimity of opinion on a particular size for the high school which tends to provide the best educational opportunities at a reasonable cost per pupil.

CHAPTER III

FINDINGS

This study was designed to analyze the relationship, if any, of secondary school size in Michigan to per pupil cost as measured by certain cost factors and to the quality of the educational program as measured by certain assumed effectiveness factors; and to determine if there is an optimum size for the high school in Michigan.

The raw data were compiled from official records of the Bureau of School Services of the University of Michigan and the Michigan Department of Public Instruction for the school year 1962-1963. The data were then tabulated and converted into averages, ratios, or percentages, as appropriate; and analyzed to determine the relationship, if any, of the size of the selected high schools to per pupil cost as measured by the selected cost factors and to the quality of the educational program as measured by the assumed effectiveness factors.

I. Cost Factors

The following cost factors were examined:

A. Cost per pupil for professional staff salaries

B. Cost per pupil for professional staff salaries per unit of educational opportunity

C. State equalized valuation per pupil within the total school district of which the high school is a part

D. Local tax rate in mills (based on state equalized valuation) for operation of the total school district of which the high school is a part

Cost factors C and D are not based on data related exclusively to the high school. They are based on data related to the cost of operating the total school district of which the high school is a part. Therefore, they cannot be used to test the hypothesis of this study and are included only as supplemental information.

A. Cost Per Pupil for Professional Staff Salaries

The cost per pupil for professional staff salaries was determined by dividing the total cost of professional staff salaries for the school year 1962-1963 for each high school by the high school enrollment.

Michigan school districts are required to account for elementary and secondary teachers' salaries separately. But very few school districts account for teachers' salaries by building. Thus the total cost of professional staff salaries for each high school had to be compiled by the writer. This was done by determining teacher personnel and assignments for each high school from a copy of the high schedule, which is included with each high school's report to the Bureau of School Services of the University of Michigan; and then compiling individual salaries from the Michigan Department of Public Instruction personnel records. The total cost of high school professional salaries as compiled for the study includes the high school administrative staff and any other professional staff assigned to the school such as guidance

counselors and special teachers. Necessary adjustments were made in salary figures for personnel assigned to more than one school.

The data showing the average cost per pupil for professional staff salaries, for each enrollment interval are presented in Table 2. Three and four year high schools are presented separately in Table 2 and all of the following tables to avoid any distortion which might be caused by combining the data.

Table 2

Cost Per Pupil for Professional Staff Salaries

Three Year High Schools		Four Year High Schools	
Enrollment	Cost Per Pupil	Enrollment	Cost Per Pupil
0- 399	$342.32	0- 199	$322.83
		200- 399	265.06
400- 599	313.46	400- 599	275.04
600- 799	302.91	600- 799	272.03
800- 999	314.59	800- 999	260.93
1000-1199	319.98	1000-1199	281.24
1200-1399	318.38	1200-1399	296.30
1400-1799	332.03	1400-1599	300.84
		1600-1799	284.34
1300-1999	326.24	1800-1999	276.69
2000-2199	298.04		
2200-2399	267.96	2200-2399	279.64
2400-2599	358.39		
		Over 2600	252.38

The data in Table 2 show a sharp decrease in per pupil cost for professional staff salaries for both three and four year high schools as size increases from the smallest size interval to the next larger size interval. The average per

pupil cost for professional staff salaries continues to decrease through the 600-799 enrollment interval for three year high schools after which no consistent decrease is noted. No consistent decrease is noted beyond the 200-399 enrollment interval for four year high schools.

3. Cost Per Pupil for Professional Staff Salaries Per Unit of Educational Opportunity

The total number of credits or units of educational opportunity offered by each high school in the school year 1962-1963 was determined from a copy of the high school schedule. All classes which met daily for two semesters were counted as one unit of educational opportunity, including activity type classes such as physical education and music. Classes which did not meet daily or for two semesters were weighted accordingly.

The cost per pupil for professional staff salaries per unit of educational opportunity was determined by dividing the cost per pupil for professional staff salaries by the total number of units of educational opportunity offered by each high school.

The data showing the average cost per pupil for professional staff salaries per unit of educational opportunity, for each enrollment interval are presented in Table 3. A consistent decrease is noted in the cost per pupil for both three and four year high schools as inrollment increases up to an enrollment of 1000. The decrease is less marked and less consistent above an enrollment of 1000, but some tendency

is noted for this cost factor to decrease as size increases throughout the entire enrollment continuum.

Table 3

Cost Per Pupil for Professional Staff Salaries Per Unit of Educational Opportunity

Three Year High Schools		Four Year High Schools	
Enrollment	Cost Per Pupil	Enrollment	Cost Per Pupil
0- 399	$7.12	0- 199	$8.73
		200- 399	6.02
400- 599	5.03	400- 599	5.00
600- 799	4.98	600- 799	4.62
800- 999	4.24	800- 999	4.24
1000-1199	4.37	1000-1199	4.42
1200-1399	4.32	1200-1399	4.34
1400-1799	4.25	1400-1599	3.72
		1600-1799	3.63
1800-1999	3.80	1800-1999	3.79
2000-2199	3.66		
2200-2399	3.60	2200-2399	2.89
2400-2599	3.27		
		Over 2600	2.84

C. and D. State Equalized Valuation Per Pupil and Local Tax Rate in Mills for Operation of the Total School District of which the High School is a Part

The data showing the average state equalized valuation per pupil and the average local tax rate in mills for operation levied by the school district of which the high school is a part, for each enrollment interval are presented in Table 4. The data does not seem to indicate any consistent relationship between the size of the high school and the state equalized valuation per pupil. Nor does there seem to

be any relationship between the size of the high school and the local tax rate for operation levied by the school district of which the high school is a part. The data would also seem to indicate that there is little, if any, relationship between the wealth of a school district, as measured by the state equalized valuation per child, and the local tax rate for operation levied by the school district.

Table 4

State Equalized Valuation Per Pupil and Local Tax Rate in Mills for Operation of the Total School District of which the High School is a Part

Three Year High Schools			Four Year High Schools		
Enrollment	Valuation	Tax Rate	Enrollment	Valuation	Tax Rate
0- 399	$13,360	15.242	0- 199	$ 9,963	11.125
			200- 399	10,823	10.458
400- 599	10,139	13.353	400- 599	13,172	11,237
600- 799	11,611	12.699	600- 799	10,657	12.694
800- 999	20,011	12.279	800- 999	11,772	11.740
1000-1199	14,722	14.703	1000-1199	10,657	15.739
1200-1399	18,986	13.853	1200-1399	15,043	14.954
1400-1799	18,426	18.300	1400-1599	15,949	13.319
			1600-1799	9,604	17.717
1800-1999	17,771	15.307	1800-1999	17,215	15,317
2000-2199	16,377	13.372			
2200-2399	15,359	14.050	2200-2399	15,446	14.038
2400-2599	20,239	16.967			
			Over 2600	11,441	15.478

E. Summary of Findings from Examination of Cost Factors

1. The data show that three year high schools with an enrollment of less than 400 students, and four year high schools with an enrollment of less than 200 students are

paying a premium for their educational program.

2. The data show that the cost per pupil for professional staff salaries decreases as the size of the high school increases up to an enrollment of 300 students for three year high schools, and up to an enrollment of 400 students for four year high schools.

3. The data show that the cost per pupil for professional staff salaries per unit of educational opportunity decreases as the size of the high school increases up to an enrollment of 1000 students for both three and four year high schools. The decrease is less marked and is not consistent beyond an enrollment of 1000 students, but some tendency is noted for this factor to continue to decrease as size increases throughout the entire enrollment continuum.

4. The data indicate that neither the state equalized valuation per pupil nor the local tax rate levied for operation by the school district of which the high school is a part seem to be related to the size of the high school.

II. Assumed Effectiveness Factors

The selected high schools were examined in relation to the following assumed effectiveness factors:

A. Institutional Factors

1. Accreditation

a. Accredited by the University of Michigan

b. Accredited by both the University of Michigan and the North Central Association of Colleges and Secondary Schools

2. Extent of course offering

   a. Language Arts (e.g. English, Speech, Journalism)

   b. Science

   c. Mathematics

   d. Social Studies

   e. Foreign Language

   f. Fine Arts (e.g. Music, Art, Dramatics)

   g. Practical Arts (e.g. Business, Industrial Arts, Homemaking, Agriculture)

   h. Health and Physical Education

3. Percent of classes enrolling less than 10 pupils

4. Percent of classes enrolling more than 35 pupils (exclusive of music and physical education)

B. Library Factors

   1. Number of usable books per pupil in library

   2. Percent of enrollment which can be seated in library

   3. Per pupil expenditure for library services

   4. Professional preparation of librarian

C. Pupil Factors

   1. Pupil-teacher ratio

   2. Ratio of students to guidance counselors

   3. Professional preparation of guidance counselors

   4. Percent of last year's graduates continuing education beyond high school

      a. Percent now attending standard colleges, universities, junior colleges, community colleges, etc.

b. Percent now attending other types of schools (business, trade, etc.)

D. Teacher Factors

1. Percent of teachers with a Masters degree or beyond

2. Teaching assignment

a. Percent of teachers whose teaching assignment includes only those subjects in which they have a teaching major

b. Percent of teachers whose teaching assignment includes one or more subjects in which they have only a teaching minor

c. Percent of teachers whose teaching assignment includes one or more subjects in which they do not have either a teaching major or minor

d. Average number of classes and/or study halls met per day by teachers

e. Average number of different preparations per day for each teacher

f. Percent of teachers assigned to more than 170 pupils per day

3. Average age of teachers

4. Percent of teachers new to school for current school year

5. Professional experience of teachers

a. Average number of years of teaching experience

b. Average number of years taught in present school

6. Average salary of teachers

E. Administrative Factors

1. Percent of principals with Masters degree or beyond

2. Average age of principals

3. Professional experience of principals

   a. Average number of years of experience including both teaching and administration

   b. Average number of years of previous administrative experience

   c. Average number of years in present position

4. Average salary of principals

5. Ratio of teachers to administrators (principal and assistants)

F. Building Factors

1. Percent of schools with an auditorium

2. Percent of schools with guidance facilities

3. Percent of schools with a gymnasium

4. Percent of schools with a swimming pool

5. Average age of original building and additions

Institutional Factors

1. Accreditation

The University of Michigan is the official accrediting
cy for high schools in the state of Michigan. Secondary
ols accredited by the University of Michigan are evalu-
on the basis of criteria defined and approved by the
utive Committee of the Bureau of School Services of the
rsity of Michigan. The accreditation status of a sec-
y school is revieved annually on the basis of informa-
submitted by the school in an annual report and regular
ts to the school conducted by the Bureau of School Serv-

Many high schools in Michigan are also accredited by
North Central Association of Colleges and Secondary

Schools. One of the basic criterion for North Central Association membership is that a school must first receive the highest accreditation rating of the official accrediting agency of the state.

A comparison of the percentage of accredited high schools to school size is presented in Table 5. Accreditation percentages were determined by dividing the number of accredited schools in each enrollment interval by the total number of schools in the enrollment interval. The data show that the level of accreditation tends to increase as size increases up to the 300-999 enrollment interval for three year high schools, from which point on all three year high schools are accredited by both the University of Michigan and the North Central Association. The data show that the level of accreditation of four year high schools also increases up to the 300-999 enrollment interval. But not all of the four year high schools are accredited by both the University of Michigan and the North Central Association until the 1400-1599 enrollment interval is reached.

The data would seem to indicate that high schools with an enrollment of less than 300 students tend to be inferior to larger high schools when the factor accreditation is used as a measure of quality.

2. Extent of Course Offering

A comprehensive high school must offer a wide range of subjects to meet the needs of individual students. The data presented in Table 6 show the relationship between the size

Table 5

Percentage of Accredited High Schools by Enrollment Interval

Enrollment	Not Accredited	Accredited by Univ. of Mich.	Accredited by Univ. of Mich. and the North Central Assoc.
Three Year High Schools			
0- 399		33.3%	66.7%
400- 599		22.2	77.8
600- 799		16.7	83.3
800- 999			100.0
1000-1199			100.0
1200-1399			100.0
1400-1799			100.0
1800-1999			100.0
2000-2199			100.0
2200-2399			100.0
2400-2599			100.0
Four Year High Schools			
0- 199	29.4%	64.7%	5.9%
200- 399	4.0	74.0	22.0
400- 599	1.6	39.7	58.7
600- 799		21.1	78.9
800- 999		8.0	92.0
1000-1199		25.0	75.0
1200-1399		20.0	80.0
1400-1599			100.0
1600-1799			100.0
1800-1999			100.0
2200-2399			100.0
Over 2600			100.0

of the high school and the average number of units of educational opportunity offered. All classes which met daily for two semesters were counted as one unit of educational oppor-

tunity, including activity type classes such as physical education and music. Classes which did not meet daily or for two semesters were weighted accordingly.

Table 6

Average Number of Units of Educational Opportunity Offered by High Schools of Various Enrollments

Three Year High Schools		Four Year High Schools	
Enrollment	Units of Ed. Oppor.	Enrollment	Units of Ed. Oppor.
0- 399	52.2	0- 199	33.9
		200- 399	45.4
400- 599	63.0	400- 599	55.7
600- 799	60.9	600- 799	59.6
800- 999	74.7	800- 999	62.2
1000-1199	74.5	1000-1199	65.7
1200-1399	75.5	1200-1399	69.3
1400-1799	92.0	1400-1599	81.4
		1600-1799	79.0
1800-1999	96.6	1800-1999	74.3
2000-2199	82.3		
2200-2399	75.0	2200-2399	97.9
2400-2599	114.1		
		Over 2600	91.8

The data in Table 6 show a consistent increase in the number of units of educational opportunity offered by four year high schools as size increases up to and including the 1400-1599 enrollment interval. The increase is not consistent for three year high schools, but the data show that the number of units of educational opportunity offered by three year high schools also tends to increase as size increases up to an enrollment range of 1400-1799.

Table 7

Average Number of Units of Educational Opportunity Offered in Each of the Subject Matter Areas by High Schools of Various Enrollments

Three Year High Schools

Enrollment	L.A.	S.	M.	S.S.	F.L.	F.A.	P.A.	H.	Total
0- 399	4.9	4.3	5.4	4.3	2.3	6.0	12.9	5.5	52.2
400- 599	5.3	5.1	5.9	5.2	5.1	8.3	20.2	7.1	63.0
600- 799	6.3	5.0	5.4	4.4	5.5	7.9	21.3	5.1	60.9
800- 999	6.9	5.2	5.6	5.1	9.0	9.9	25.4	6.6	74.7
1000-1199	6.7	5.5	6.9	5.2	9.5	10.6	24.4	5.7	74.5
1200-1399	6.6	5.5	6.3	5.4	8.7	10.5	26.4	6.1	75.5
1400-1799	9.2	5.6	7.6	6.3	13.3	12.3	31.0	6.7	92.0
1800-1999	7.9	5.7	5.8	5.2	10.2	12.7	35.1	5.0	86.6
2000-2199	9.0	5.3	6.9	5.9	8.8	12.4	30.0	3.5	82.3
2200-2399	9.8	6.3	7.0	7.3	9.3	10.9	21.8	2.3	75.0
2400-2599	10.8	9.2	10.3	8.0	14.8	17.7	37.3	5.0	114.1

Four Year High Schools

0- 199	4.9	3.4	4.1	3.7	1.5	3.1	14.5	3.7	38.9
200- 399	5.4	4.1	4.9	4.1	2.5	5.0	15.2	4.2	45.4
400- 599	5.9	4.6	5.6	4.6	4.1	7.2	18.4	5.3	55.7
600- 799	6.3	4.7	5.2	4.6	4.7	9.2	19.5	5.4	59.6
800- 999	6.4	4.6	5.7	4.7	5.3	9.9	20.5	5.1	62.2
1000-1199	7.5	4.9	5.9	5.0	6.0	10.4	21.7	4.3	65.7
1200-1399	7.5	4.3	6.3	4.3	6.4	10.9	21.9	7.2	69.0
1400-1599	6.6	4.9	6.1	5.4	7.6	12.5	31.9	6.4	81.4
1600-1799	9.7	6.2	6.9	5.7	8.0	9.7	27.3	5.5	79.0
1800-1999	7.2	5.3	6.0	5.0	10.5	11.3	25.7	3.3	74.3
2200-2399	9.5	5.3	8.4	6.5	14.0	14.9	34.3	4.5	97.9
Over 2600	8.8	5.1	8.4	5.4	11.5	13.1	34.0	5.5	91.8

L.A. - Language Arts
S. - Science
M. - Mathematics
S.S. - Social Studies
F.L. - Foreign Languages
F.A. - Fine Arts
P.A. - Practical Arts
H. - Health and Physical Ed.

The data presented in Table 7 show the average number of units of educational opportunity offered in each of the subject matter areas by high schools of various enrollments. The totals in Table 7 correspond to the data presented in Table 6. Table 7 was included as a supplement to Table 6 to show the relationship between the size of the high school and the number of units of educational opportunity offered in specific subject areas. For example, the data in Table 7 show that high schools with an enrollment of less than 400 students tend to have very limited offerings in foreign languages. The data show that larger high schools tend to have an expanded offering in many subject areas compared to small high schools. It should be pointed out, however, that an examination of the high school schedules revealed that the apparent increase in offerings in some subject areas, such as language arts, may have been due to ability grouping within a particular subject rather than an actual increase in the number of subjects offered.

3. Percent of Classes Enrolling Less than 10 Pupils

Class size is a complex problem and opinions vary on what size class is most desirable for various types of educational endeavor. However, most educators would agree that very small classes are expensive to maintain and that they often constitute an inefficient utilization of a teacher's time and talent. The data presented in Table 7 show the relationship between the size of the high school and the percent of classes enrolling less than ten pupils.

Table 8

Percent of Classes Enrolling Less Than 10 Pupils

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	2.1	0- 199	9.0
		200- 399	2.5
400- 599	0.8	400- 599	1.3
600- 799	1.2	600- 799	1.7
800- 999	0.8	800- 999	0.5
1000-1199	1.1	1000-1199	0.3
1200-1399	1.0	1200-1399	1.0
1400-1799	2.2	1400-1599	2.3
		1600-1799	1.8
1800-1999	0.8	1800-1999	1.3
2000-2199	0.5		
2200-2399	1.2	2200-2399	0.4
2400-2599	0.3		
		Over 2600	0.8

The data in Table 8 indicate that four year high schools with an enrollment of less than 200 students tend to have a much higher percentage of classes with less than ten students than larger high schools. The data also indicate that the percent of classes enrolling less than ten students tends to decrease as the size of the high school increases up to an enrollment of 600 students beyond which there does not appear to be any consistent relationship to size.

4. Percent of Classes Enrolling More Than 35 Pupils

As stated in the preceding section, opinions vary on what size class is most desirable for various types of educational endeavor. However, many educators feel that it is difficult to give sufficient individual attention to students in academic classes of more than 35 pupils. The data pre-

sented in Table 9 show the relationship between the size of the high school and the percent of classes enrolling more than 35 pupils. Large lecture type classes with smaller recitation sections and television classes were excluded as were activity type classes such as music and physical education. The data indicate that there is little, if any, relationship between the size of the high school and the percent of classes enrolling more than 35 pupils.

Table 9

Percent of Classes Enrolling More Than 35 Pupils

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	4.4	0- 199	5.5
		200- 399	6.4
400- 599	4.4	400- 599	4.4
600- 799	3.3	600- 799	3.4
800- 999	5.3	800- 999	5.4
1000-1199	3.1	1000-1199	4.9
1200-1399	4.7	1200-1399	11.6
1400-1799	2.1	1400-1599	6.9
		1600-1799	11.5
1800-1999	3.9	1800-1999	10.7
2000-2199	3.0		
2200-2399	6.5	2200-2399	3.8
2400-2599	1.4		
		Over 2600	10.3

5. Summary of Findings from Examination of Institutional Factors

The data show that:

a. High schools with an enrollment of less than 800 students tend to have a lower accreditation rating than larger high schools.

b. High schools with an enrollment of less than 400 students tend to have a limited offering in many subject matter areas, and especially in foreign languages.

c. The number of units of educational opportunity offered by both three and four year high schools tends to increase as enrollment increases up to an enrollment range from 1400 to 1799 students beyond which there appears to be little, if any, relationship to the size of the high school.

d. High schools with an enrollment of less than 600 students tend to have a higher percentage of classes with less than ten pupils than larger high schools. This characteristic would tend to contribute to the higher per pupil cost for professional salaries reported earlier in this chapter for these schools.

e. There is little, if any, relationship between the size of the high school and the percent of classes enrolling more than 35 pupils.

B. Library Factors

1. Number of Usable Books Per Pupil in Library

The data presented in Table 10 show the relationship between the size of the high school and the number of usable books per pupil in the library collection, and the percent of schools in each enrollment interval which satisfy the criterion for the adequacy of the library collection as defined by the North Central Association of Colleges and Secondary Schools.[96] (These percentages were calculated by the writer and do not indicate whether or not the schools were accredited by the North Central Association.)

The data in Table 10 indicate that the number of usable books per pupil in the library tends to decrease as the size of the high school increases throughout the entire enrollment continuum. However, the decrease does not appear to be consistent beyond an enrollment of about 1200 students.

The data would also seem to indicate that many high schools with an enrollment of more than 1800 students do not satisfy North Central Association criterion pertaining to the number of usable books per pupil in the library collection.

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96. The North Central Association of Colleges and Secondary Schools, Policies and Criteria for the Approval of Secondary Schools (Chicago, Illinois: The Association, 1964), p. 19.

Table 10

Number of Usable Books Per Pupil in Library and Percent of Schools which Satisfy North Central Criterion

Three Year High Schools			Four Year High Schools		
Enrollment	Number	Percent	Enrollment	Number	Percent
0- 399	10.5	66.7	0- 199	16.9	100.0
			200- 399	9.7	70.8
400- 599	8.5	88.9	400- 599	8.4	52.5
600- 799	8.5	75.0	600- 799	8.4	50.0
800- 999	7.8	62.5	800- 999	6.6	56.0
1000-1199	7.6	72.7	1000-1199	4.9	50.0
1200-1399	6.5	66.7	1200-1399	5.4	80.0
1400-1799	6.9	85.7	1400-1599	6.8	60.0
			1600-1799	15.3	100.0
1800-1999	5.8	55.3	1800-1999	4.4	33.3
2000-2199	4.7	33.3			
2200-2399	4.6	33.3	2200-2399	5.3	75.0
2400-2599	6.8	100.0			
			Over 2600	4.1	50.0

2. Percent of Enrollment which Can Be Seated in Library

The data presented in Table 11 show the relationship between the size of the high school and the percent of the enrollment which can be seated in the library, and the percent of schools in each size interval which satisfy the criterion for the library quarters as defined by the North Central Association of Colleges and Secondary Schools.[97] The data show that the percent of enrollment which can be seated in the library tends to decrease as as the size of the high school increases throughout the entire enrollment continuum with only a few exceptions. The data would also seem to in-

97. Ibid.

Table 11

Percent of Enrollment which Can Be Seated in the Library and Percent of Schools which Satisfy North Central Criterion

Three Year High Schools			Four Year High Schools		
Enrollment	Percent Seated	Percent Satisfy Criterion	Enrollment	Percent Seated	Percent Satisfy Criterion
0- 399	22.4	100.0	0- 199	40.4	100.0
			200- 399	17.6	87.5
400- 599	13.4	100.0	400- 599	13.3	87.1
600- 799	11.5	75.0	600- 799	14.2	79.3
800- 999	10.9	87.5	800- 999	9.2	68.0
1000-1199	10.8	63.6	1000-1199	7.8	62.5
1200-1399	7.7	33.3	1200-1399	8.1	100.0
1400-1799	7.6	57.1	1400-1599	8.1	60.0
			1600-1799	5.2	0.0
1800-1999	6.9	44.4	1800-1999	7.0	66.7
2000-2199	4.9	66.7			
2200-2399	6.5	66.7	2200-2399	5.4	75.0
2400-2599	4.9	33.3			
			Over 2600	4.3	50.0

dicate that many high schools with an enrollment of more than 1200 students do not satisfy North Central criterion pertaining to the percent of the enrollment which can be seated in the library.

3. Per Pupil Expenditure for Library Services

The data presented in Table 12 show the relationship between the size of the high school and the annual per pupil expenditure for books and magazines exclusive of textbooks and audio-visual materials, and the percent of high schools in each enrollment interval which satisfy the criterion for library expenditures as defined by the North Central Associa-

Table 12

Per Pupil Expenditure for Library Services and Percent of Schools which Satisfy North Central Criterion

Three Year High Schools			Four Year High Schools		
Enrollment	Expenditure	Percent	Enrollment	Expenditure	Percent
0- 399	$3.13	66.7	0- 199	$5.20	100.0
			200- 399	5.20	37.0
400- 599	4.28	88.9	400- 599	5.11	93.5
600- 799	6.81	100.0	600- 799	3.67	100.0
800- 999	2.93	100.0	800- 999	3.44	88.0
1000-1199	2.81	100.0	1000-1199	3.32	75.0
1200-1399	2.99	100.0	1200-1399	4.57	100.0
1400-1799	3.03	100.0	1400-1599	3.94	100.0
			1600-1799	1.53	66.7
1800-1999	1.90	100.0	1800-1999	1.79	66.7
2000-2199	2.46	100.0			
2200-2399	1.24	100.0	2200-2399	1.93	100.0
2400-2599	3.43	100.0			
			Over 2600	1.62	100.0

tion of Colleges and Secondary Schools.[93]

The data in Table 12 do not show any consistent relationship between the size of the high school and the per pupil expenditure for library services for three year high schools. However, for four year high schools the data indicate that the per pupil expenditure tends to decrease as the size of the high school increases up to and including the 1000-1199 enrollment interval. The data does not show any relationship between the size of the high school and the percent of schools which satisfy North Central criterion. The data does seem to indicate, however, that many of the

93. Ibid., p. 20

same schools which did not satisfy the North Central criterion for the number of usable books per pupil in the library collection do seem to satisfy the expenditure criterion.

4. Professional Preparation of Librarian

The data presented in Table 13 show the relationship between the size of the high school and the professional preparation of the librarian.

Table 13

Professional Preparation of Librarians

Three Year High Schools			Four Year High Schools		
Enrollment	Average Semester Hours	Percent with 15 or more Sem. Hrs.	Enrollment	Average Semester Hours	Percent with 15 or more Sem. Hrs.
0- 399	25.1	83.3	0- 199	6.6	16.7
			200- 399	14.4	47.9
400- 599	21.8	38.9	400- 599	21.7	80.6
600- 799	26.2	91.7	600- 799	21.6	78.9
800- 999	28.4	100.0	800- 999	23.1	96.0
1000-1199	33.9	100.0	1000-1199	35.3	100.0
1200-1399	35.9	100.0	1200-1399	35.3	100.0
1400-1799	31.5	100.0	1400-1599	31.6	100.0
			1600-1799	20.7	100.0
1800-1999	28.1	100.0	1800-1999	39.7	100.0
2000-2199	31.3	100.0			
2200-2399	29.5	100.0	2200-2399	26.8	100.0
2400-2599	37.2	100.0			
			Over 2600	32.4	100.0

The data in Table 13 show that the average number of semester hours of library science earned by the high school librarians tends to increase as the size of the high school increases up to and including the 1200-1399 enrollment in-

terval. Beyond this point the data show very little, if any, relationship to the size of the high school. The data indicate that the librarians in many high schools with an enrollment of less than 400 students do not have 15 semester hours of library science, which is the minimum recommended by the North Central Association of Colleges and Secondary Schools.[99]

5. Summary of Findings from Examination of Library Factors

The data show that:

a. Many high schools in Michigan do not have the recommended number of usable books per pupil in the library.

b. Many high schools in Michigan with enrollments of more than 1200 students cannot seat the recommended percentage of their enrollment in the library.

c. The average number of semester hours earned by the librarians increases as the size of the high school increases up to and including the 1200-1399 enrollment interval.

C. Pupil Factors

1. Pupil-Teacher Ratio

The data presented in Table 14 show the relationship between the size of the high school and the pupil-teacher ratio. The data show that the average pupil-teacher ratio increases slightly as the size of the high school increases. However, even the largest high schools appear to be well below the maximum limit of 27 to 1 suggested by the North Cen-

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99. Ibid., p. 18.

Table 14

Pupil-Teacher Ratio

Three Year High Schools		Four Year High Schools	
Enrollment	Pupil-Teacher Ratio	Enrollment	Pupil-Teacher Ratio
0- 399	17.7 to 1	0- 199	15.4 to 1
		200- 399	19.0
400- 599	18.7	400- 599	20.4
600- 799	20.8	600- 799	21.0
800- 999	20.2	800- 999	22.7
1000-1199	20.4	1000-1199	22.8
1200-1399	20.9	1200-1399	21.3
1400-1799	19.8	1400-1599	22.2
		1600-1799	22.6
1800-1999	21.9	1800-1999	24.2
2000-2199	23.2		
2200-2399	25.1	2200-2399	23.7
2400-2599	21.2		
		Over 2600	24.6

tral Association of Colleges and Secondary Schools.[100] The data also show that high schools with an enrollment of less than 400 students tend to have a very low pupil-teacher ratio, a condition which contributes to a high cost per pupil.

2. Ratio of Students to Guidance Counselors

The data presented in Table 15 show the relationship between the size of the high school and the ratio of students to guidance counselors, and the percent of schools in each enrollment interval which have a ratio of students to guidance counselors below the 300 to 1 limit suggested by the North Central Association of Colleges and Secondary Schools.[101]

100. Ibid. p., 14.

101. Ibid., p. 17.

Table 15

Ratio of Students to Guidance Counselors and Percent of Schools with a Ratio of Less than 300 to 1

Three Year High Schools			Four Year High Schools		
Enrollment	Ratio	Percent	Enrollment	Ratio	Percent
0- 399	340 to 1	20.0*	0- 199	455 to 1	40.0**
			200- 399	553	7.0***
400- 599	410	44.4	400- 599	513	20.0****
600- 799	358	16.7	600- 799	473	10.5
800- 999	336	50.0	800- 999	456	16.0
1000-1199	390	13.2	1000-1199	399	12.5
1200-1399	375	22.2	1200-1399	344	20.0
1400-1799	286	57.1	1400-1599	335	20.0
			1600-1799	343	33.3
1800-1999	343	25.0	1800-1999	455	0.0
2000-2199	372	16.7			
2200-2399	403	0.0	2200-2399	341	25.0
2400-2599	292	66.7			
			Over 2600	360	0.0

* One school in this group had no guidance counselor.

** Two schools in this group had no guidance counselors.

*** Five schools in this group had no guidance counselors

**** Two schools in this group had no guidance counselors.

The data in Table 15 indicate that high schools with an enrollment of less than 600 students appear to have more difficulty in providing adequate guidance services than larger high schools. However, the data indicate that many large high schools are not providing the recommended services. It would appear from the data that high schools in the 1400-

1799 enrollment interval tend to maintain the lowest ratio of students to guidance counselors.

3. Professional Preparation of Guidance Counselors

The data showing the relationship between the size of the high school and the professional preparation of the guidance counselors are presented in Table 16.

Table 16

Professional Preparation of Guidance Counselors

Three Year High Schools			Four Year High Schools		
Enrollment	Semester Hours	Percent with 15 or more Sem. Hrs.	Enrollment	Semester Hours	Percent with 15 or more Sem. Hrs.
0- 399	23.8	100.0	0- 199	11.8	30.0
			200- 399	15.8	52.6
400- 599	22.7	100.0	400- 599	19.6	70.6
600- 799	23.2	90.9	600- 799	24.2	88.9
800- 999	25.8	100.0	800- 999	22.5	80.5
1000-1199	24.2	81.9	1000-1199	24.3	100.0
1200-1399	21.3	100.0	1200-1399	25.3	100.0
1400-1799	25.2	83.3	1400-1599	23.1	100.0
			1600-1799	23.4	100.0
1800-1999	21.3	88.9	1800-1999	19.7	66.7
2000-2199	23.9	100.0			
2200-2399	22.0	100.0	2200-2399	21.2	100.0
2400-2599	23.2	100.0			
			Over 2600	19.5	100.0

The data in Table 16 show that three year high schools with an enrollment of less than 400 students tend to have a high percentage of guidance counselors with less than 15 semester hours of graduate preparation in guidance and counseling, the minimum recommended by the North Central Association

of Colleges and Secondary Schools.[102]

4. Percent of Last Year's Graduates Continuing Education Beyond High School

The data presented in Table 17 show the relationship between the size of the high school and the percent of the previous year's graduates that are continuing their education beyond high school. This factor was divided into two classifications; the percent of last year's graduates now attending standard colleges, universities, junior colleges, community colleges, etc.; and the percent now attending other types of schools such as business or trade schools.

Table 17

Percent of Last Year's Graduates Continuing Education Beyond High School

Three Year High Schools				Four Year High Schools			
Enrollment	% Stnd. Col.	% Other Col.	Total	Enrollment	% Stnd. Col.	% Other Col.	Total
0- 399	26.3	14.3	40.6	0- 199	22.0	6.0	28.0
				200- 399	33.0	8.3	41.3
400- 599	37.4	10.5	47.9	400- 599	35.1	7.7	42.8
600- 799	35.5	5.7	41.2	600- 799	33.6	9.2	42.3
800- 999	49.0	6.7	55.7	800- 999	38.1	9.0	47.1
1000-1199	46.3	13.6	59.9	1000-1199	34.9	5.5	40.4
1200-1399	37.3	6.1	43.4	1200-1399	35.6	6.5	42.1
1400-1799	49.2	8.4	57.6	1400-1599	41.6	4.4	46.0
				1600-1799	37.1	6.4	43.5
1800-1999	38.2	5.6	43.8	1800-1999	30.2	3.9	34.1
2000-2199	35.8	5.2	41.0				
2200-2399	43.9	3.3	47.2	2200-2399	38.3	5.5	43.8
2400-2599	59.4	4.1	63.5				
				Over 2600	42.4	4.5	46.9

The data in Table 17 indicate that high schools with an enrollment of less than 400 students tend to have a smaller percentage of their students go on to college than larger high schools. The data also indicates that those three year high schools in the largest enrollment interval, 2400-2599, have a higher percentage of their previous year's graduates enrolled in college than any other group of high schools in the sample. It should be noted, however, that these large three year high schools tend to be located in urban communities, many of which also support community colleges.

5. Percent of Dropouts During the Previous School Year

High school dropout is a problem which has received nationwide attention in recent years. It is generally recognized as a complex problem which may be influenced by several factors. A thorough examination of the problem is certainly beyond the scope of this study, but an attempt was made to examine the relationship between the size of the high school and the rate of dropout for the high schools included in this study.

The data showing the relationship between the size of the high school and the percent of dropouts during the previous school year are presented in Table 18. The percent of dropout was determined by dividing the number of dropouts for the previous school year, as reported by the high school principal in his annual report to the Bureau of School Serv-

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102. Ibid., p. 18.

ices of the University of Michigan, by the high school enrollment for that school year (1961-1962).

Table 18

Percent of Dropouts During the Previous School Year

Three Year High Schools		Four Year High Schools	
Enrollment	Percent Dropout	Enrollment	Percent Dropout
0- 399	4.9	0- 199	3.5
		200- 399	3.4
400- 599	4.3	400- 599	3.8
600- 799	5.6	600- 799	4.0
800- 999	6.6	800- 999	4.2
1000-1199	4.0	1000-1199	5.7
1200-1399	5.8	1200-1399	5.5
1400-1799	4.7	1400-1599	5.0
		1600-1799	4.7
1800-1999	8.2	1800-1999	7.1
2000-2199	7.9		
2200-2399	8.1	2200-2399	5.4
2400-2599	5.3		
		Over 2600	5.6

The data in Table 18 show a slight increase in the percent of dropout for four year high schools as size increases up to and including the 1000-1199 enrollment interval. Beyond this point there is some decrease in the percent of dropout as size increases up to and including the 1600-1799 enrollment interval. No consistent relationship is noted for three year schools. But a sharp increase in the percent of dropout is noted for both three and four year high schools at the 1800-1999 enrollment interval. The dropout rate remains relatively high through the 2200-2399 enrollment interval for three year high schools and then decreases. A simi-

lar decrease occurs for four year high schools at the 2200-2399 enrollment interval.

6. Summary of Findings from Examination of Pupil Factors

The data show that:

a. High schools with an enrollment of less than 400 students tend to have a lower pupil-teacher ratio than larger high schools. Or, stated conversely, high schools with an enrollment of less than 400 students tend to require more teachers per 100 students than larger high schools.

b. High schools with an enrollment of less than 600 students seem to have more difficulty providing adequate guidance services than larger high schools. However, many larger high schools also exceed the suggested 300 to 1 ratio of students to guidance counselors.

c. Four year high schools with an enrollment of less than 400 students tend to have a higher percentage of guidance counselors with less than the recommended 15 semester hours of graduate preparation in guidance and counseling than three year high schools and larger four year high schools.

d. High schools with an enrollment of less than 400 students tend to have a smaller percentage of their graduates enroll in standard colleges than graduates of larger high schools. No consistent relationship to size is noted for high schools with more than 400 students, but a sharp increase in the percent of graduates enrolling in standard

colleges is noted for those three year high schools in the largest enrollment interval, 2400-2599. The percent of graduates attending other types of schools does not appear to be related to the size of the high school.

e. There does not appear to be any consistent relationship between the size of the high school and the rate of dropout for the high schools included in this study. The highest dropout percentage occurred in relatively large high schools, the 1800-2399 enrollment intervals for three year high schools and the 1800-1999 enrollment intervals for four year high schools; but for both three and four year high schools the dropout percentages were lower in the next larger enrollment intervals.

D. Teacher Factors

1. Percent of Teachers with a Masters Degree or Beyond

The data showing the relationship between the size of the high school and the percent of teachers with a Masters degree or beyond are presented in Table 19. The data show that the percent of teachers with a Masters degree or beyond tends to increase as the size of the high school increases throughout the entire enrollment continuum, but the increase is not consistent.

2. Teaching Assignment

The data presented in Table 20 show the relationship between the size of the high school and the following factors related to teachers' assignments:

Table 19

Percent of Teachers with a Masters Degree or Beyond

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	26.9	0- 199	25.6
		200- 399	22.0
400- 599	37.3	400- 599	30.5
600- 799	40.4	600- 799	32.8
800- 999	45.7	800- 999	33.5
1000-1199	47.1	1000-1199	54.4
1200-1399	46.0	1200-1399	38.5
1400-1799	58.1	1400-1599	45.4
		1600-1799	42.1
1800-1999	58.9	1800-1999	49.5
2000-2199	50.2		
2200-2399	52.0	2200-2399	54.9
2400-2599	70.8		
		Over 2600	40.9

a. Percent of teachers whose teaching assignment includes only those subjects in which they have a teaching major

b. Percent of teachers whose teaching assignment includes one or more subjects in which they have only a teaching minor

c. Percent of teachers whose teaching assignment includes one or more subjects in which they do not have either a teaching major or minor

d. Average number of classes and/or study halls not per day by teachers

e. Average number of different preparations per day for each teacher

f. Percent of teachers assigned to more than 170 pupils per day exclusive of certain activity type classes such as typewriting, physical education, and music[103]

103. Ibid., p. 14.

Table 20

Relationship of Teaching Assignment to Size of High School

Enrollment	Percent Major	Percent Minor	Percent Neither	Number Classes	Number Prep.	Percent More 170
Three Year High Schools						
0- 399	64.3	17.7	18.0	5.8	3.0	6.0
400- 599	53.1	33.3	8.6	5.1	2.4	5.1
600- 799	69.8	21.3	8.9	5.3	2.4	1.9
800- 999	71.1	16.5	12.4	5.1	2.3	4.4
1000-1199	68.6	20.8	10.6	5.2	2.4	0.0
1200-1399	69.4	20.5	9.6	5.0	2.4	0.0
1400-1799	70.9	19.2	9.9	5.1	2.3	0.0
1800-1999	73.6	19.3	7.1	5.3	2.3	33.3
2000-2199	67.8	24.0	8.2	5.5	2.3	0.0
2200-2399	69.7	18.2	12.1	5.0	2.1	0.0
2400-2599	76.1	15.4	8.5	5.0	2.1	0.0
Four Year High Schools						
0- 199	35.5	32.2	32.3	6.0	4.0	0.5
200- 399	49.5	32.0	18.5	5.6	3.3	1.3
400- 599	56.5	29.1	14.4	5.4	2.8	2.9
600- 799	65.3	22.5	12.2	5.3	2.4	2.7
800- 999	69.4	22.0	8.6	5.1	2.3	2.2
1000-1199	68.8	18.3	12.9	5.1	2.3	1.7
1200-1399	70.9	18.4	10.7	5.0	2.3	6.3
1400-1599	70.5	19.0	10.5	5.2	2.2	2.7
1600-1799	65.1	24.2	10.7	5.0	2.3	4.2
1800-1999	74.9	13.5	11.6	5.0	2.3	2.0
2200-2399	71.8	21.3	6.9	5.0	2.4	2.0
Over 2600	70.9	20.9	8.2	5.3	2.3	4.2

The data in Table 20 show that the percent of teachers whose teaching assignment includes only those subjects in which they have a teaching major increases as the size of the high school increases up to an enrollment of 1000 in four year high schools. A corresponding decrease in the

percent of teachers whose teaching assignment includes one or more subjects in which they have only a teaching minor and in the percent of teachers whose teaching assignment includes one or more subjects in which they do not have either a teaching major or minor is also noted for four year high schools. However, the data does not seem to indicate a similar relationship to size for three year high schools, except for a sharp decrease in the percent of teachers whose teaching assignment includes one or more subjects in which they do not have either a teaching major or minor as size increases from the 0-399 enrollment interval to the 400-599 enrollment interval.

The data show a decrease in the average number of classes and/or study halls met per day by teachers as size increases up to and including the 1200-1399 enrollment interval for both three and four year high schools. A similar decrease is noted in the average number of different preparations per day required of teachers, up to and including the 800-999 enrollment interval. The percent of teachers assigned to more than 170 pupils per day does not appear to have any definite relationship to the size of the high school. And this percentage appears to be quite low for all of the high schools, except for those three year high schools in the 1300-1999 enrollment interval.

3. Average Age of Teachers

The data showing the relationship between the size of the high school and the average age of the teachers are pre-

sented in Table 21. The data would seem to indicate that there is very little, if any, relationship between the age of the teachers and the size of the high school.

Table 21

Average Age of Teachers

Three Year High Schools		Four Year High Schools	
Enrollment	Average Age	Enrollment	Average Age
0- 399	37.3	0- 199	40.4
		200- 399	36.0
400- 599	36.7	400- 599	37.6
600- 799	38.3	600- 799	37.7
800- 999	39.4	800- 999	37.9
1000-1199	40.2	1000-1199	39.2
1200-1399	37.7	1200-1399	35.2
1400-1799	42.5	1400-1599	41.7
		1600-1799	38.4
1800-1999	40.4	1800-1999	40.4
2000-2199	39.5		
2200-2399	42.4	2200-2399	43.6
2400-2599	41.7		
		Over 2600	39.4

4. Percent of Teachers New to School for Current School Year

The data showing the relationship between the size of the high school and the percent of teachers new to the school for the current school year (1962-1963) are presented in Table 22. The data do not appear to indicate any definite relationship between the size of the high school and the percent of teachers who are new to the school for the current school year. The percentages shown in Table 21 reflect both additional teachers and replacements. Thus they

do not represent an accurate measure of teacher turnover. However, they would seem to indicate that teacher turnover has very little, if any, relationship to the size of the high school.

Table 22

Percent of Teachers New to School for Current School Year

Three Year High Schools		Four Year High Schools	
Enrollment	New Teachers	Enrollment	New Teachers
0- 399	15.1%	0- 199	17.6%
		200- 399	24.0
400- 599	23.1	400- 599	20.5
600- 799	19.2	600- 799	21.4
800- 999	17.6	800- 999	22.3
1000-1199	15.3	1000-1199	13.6
1200-1399	19.6	1200-1399	23.6
1400-1799	23.2	1400-1599	20.4
		1600-1799	13.1
1800-1999	17.4	1800-1999	10.8
2000-2199	20.6		
2200-2399	19.0	2200-2399	17.4
2400-2599	18.1		
		Over 2600	26.9

5. Professional Experience of Teachers

The data presented in Table 23 show the relationship between the size of the high school and the average number of years of teaching experience of the high school teachers, and the average number of years taught in the present high school. The data show that teachers in high schools with enrollments of more than 1800 students tend to have more years of teaching experience than teachers in smaller schools. The data also show that teachers in high schools

with enrollments of more than 1000 students tend to have taught longer in their present present school than teachers in smaller high schools. However, there does not appear to be any consistent increase in the professional experience of teachers as the size of the high school increases. In fact the data show a decrease in both the total years of teaching experience and the years in the present school as size increases from the smallest enrollment interval to the next larger enrollment interval.

Table 23

Professional Experience of Teachers

Three Year High Schools			Four Year High Schools		
Enrollment	Years Experience	Years Present School	Enrollment	Years Experience	Years Present School
0- 399	10.0	6.7	0- 199	11.6	5.3
			200- 399	7.9	4.3
400- 599	8.6	4.9	400- 599	9.7	6.0
600- 799	10.9	7.1	600- 799	9.5	5.7
800- 999	11.4	7.7	800- 999	9.4	6.1
1000-1199	12.2	8.6	1000-1199	11.9	8.3
1200-1399	10.3	7.1	1200-1399	8.6	6.7
1400-1799	11.1	8.1	1400-1599	11.9	7.6
			1600-1799	8.9	6.4
1800-1999	13.1	9.4	1800-1999	13.0	9.2
2000-2199	12.8	8.7			
2200-2399	15.3	10.9	2200-2399	15.4	10.6
2400-2599	14.5	7.6			
			Over 2600	11.2	7.7

6. Average Salary of Teachers

The data showing the relationship between the size of the high school and the average salary of teachers are pre-

sented in Table 24. The data show that the average salary of teachers increases as the size of the high school increases up to and including the 1400-1799 enrollment interval for three year high schools, and up to and including the 1000-1199 enrollment interval for four year high schools. No consistent pattern is noted beyond these enrollments for either three or four year high schools. However, the highest average salary occurred in the 2400-2599 enrollment interval for three year high schools and in the 1800-1999 enrollment interval for four year high schools.

Table 24

Average Salary of Teachers

Three Year High Schools		Four Year High Schools	
Enrollment	Average Salary	Enrollment	Average Salary
0- 399	$5,643	0- 199	$5,179
		200- 399	5,348
400- 599	5,777	400- 599	5,709
600- 799	6,069	600- 799	5,717
800- 999	6,502	800- 999	5,878
1000-1199	6,539	1000-1199	6,540
1200-1399	6,556	1200-1399	6,330
1400-1799	7,166	1400-1599	6,496
		1600-1799	6,455
1800-1999	6,987	1800-1999	6,897
2000-2199	6,972		
2200-2399	6,812	2200-2399	6,803
2400-2599	7,615		
		Over 2600	6,230

7. Summary of Findings from Examination of Teacher Factors

The data show that:

a. The percent of teachers with a Masters degree tends to increase as the size of the high school increases throughout the entire enrollment continuum, but the increase is not consistent beyond an enrollment of 1200 students.

b. High schools with an enrollment of less than 600 students tend to have a higher percentage of teachers teaching in subject areas in which they do not have a teaching major, and in which they do not have either a teaching major or minor, than larger high schools.

c. The average number of classes and/or study halls met per day by teachers tends to decrease as the size of the high school increases up to an enrollment of 1400 students. The average number of different preparations per day required of teachers tends to decrease as the size of the high school increases up to an enrollment of 1000 students.

d. For the schools examined, the teachers in high schools with an enrollment of less than 1000 students appear to be slightly younger than teachers in larger high schools. However, the data does not seem to indicate any consistent relationship between the size of the high school and the age of teachers.

e. The percent of teachers new to the high school for the current school year (1962-1963) had little, if any, relationship to the size of the high school. Thus the data

would seem to indicate that the rate of teacher turnover has very little if any relationship to the size of the high school. Furthermore, the data would seem to indicate that it is not uncommon in either large or small high schools for from fifteen to twenty percent of the teaching staff to be new to the school for the current school year.

f. Teachers in high schools with an enrollment of more than 1000 students tend to have more years of teaching experience than teachers in smaller high schools. However, there does not appear to be any consistent relationship between the size of the high school and the experience of the teachers.

g. Teachers in high schools with an enrollment of more than 1000 students tend to have taught longer in their present school than teachers in smaller high schools. However, there does not appear to be any consistent relationship between the size of the high school and the number of years that teachers have been teaching in their present school.

h. The average salary received by the teachers tends to increase as the size of the high school increases up to and including the 1400-1799 enrollment interval for three year high schools, and up to and including the 1000-1199 enrollment interval for four year high schools. No consistent pattern is noted beyond these enrollment intervals for either three or four year high schools. However, the highest average salary occurred in the 2400-2599 enrollment interval for three year high schools and in the 1800-1999 enrollment

interval for four year high schools.

B. Administrative Factors

1. Percent of Principals with a Masters Degree or Beyond

The data showing the relationship between the size of the high school and the percent of the high school principals with a Masters degree or beyond are presented in Table 25.

Table 25

Percent of Principals with Masters Degree or Beyond

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	100.0	0- 199	66.7
		200- 399	89.7
400- 599	100.0	400- 599	96.6
600- 799	100.0	600- 799	100.0
800- 999	100.0	800- 999	90.5
1000-1199	100.0	1000-1199	100.0
1200-1399	100.0	1200-1399	100.0
1400-1799	100.0	1400-1599	80.0
		1600-1799	100.0
1800-1999	100.0	1800-1999	100.0
2000-2199	100.0		
2200-2399	100.0	2200-2399	100.0
2400-2599	100.0		
		Over 2600	100.0

The data presented in Table 25 show that all of the principals of the three year high schools examined had a Masters degree or beyond. And a sharp increase in the percent of principals with a Masters degree or beyond is noted for four year high schools as enrollment increases up to 600.

A further check of the 281 high schools in the sample revealed only six principals with a Doctors degree. They were distributed according to the size of the high schools as follows:

Three Year High Schools		Four Year High Schools	
1200-1399	1	400- 599	1
1800-1999	1	800- 999	1
2000-2199	1	1200-1399	1

2. Average Age of Principals

The data showing the relationship between the size of the high school and the average age of the high school principals are presented in Table 26.

Table 26

Average Age of Principals

Three Year High Schools		Four Year High Schools	
Enrollment	Average Age	Enrollment	Average Age
0- 399	50.0	0- 199	45.5
		200- 399	43.0
400- 599	42.0	400- 599	43.1
600- 799	44.9	600- 799	44.1
800- 999	46.2	800- 999	49.5
1000-1199	55.6	1000-1199	54.3
1200-1399	48.8	1200-1399	43.8
1400-1799	44.7	1400-1599	54.7
		1600-1799	49.0
1800-1999	56.9	1800-1999	40.0
2000-2199	52.0		
2200-2399	54.7	2200-2399	61.5
2400-2599	55.0		
		Over 2600	51.7

The data presented in Table 26 would seem to indicate that there is not any definite relationship between the size of the high school and the age of the high school principal.

3. Professional Experience of Principals

The data presented in Table 27 show the relationship between the the size of the high school and the professional experience of the high school principal. The following factors pertaining to the professional experience of the principals were examined: (a) average number of years of professional experience including both teaching and administration, (b) average number of years of previous administrative experience, and (c) average number of years in present position.

Table 27

Professional Experience of Principals

Three Year High Schools				Four Year High Schools			
Enrollment	Total Exp.	Prev. Exp.	Pres. Post	Enrollment	Total Exp.	Prev. Exp.	Pres. Post
0- 399	24.3	0.0	8.5	0- 199	20.3	0.3	8.2
				200- 399	16.3	2.1	6.3
400- 599	16.5	3.1	5.2	400- 599	17.0	2.4	6.4
600- 799	16.3	1.1	4.6	600- 799	16.8	2.4	7.7
800- 999	20.0	4.1	5.8	800- 999	23.7	5.0	9.8
1000-1199	23.7	4.5	15.6	1000-1199	29.8	4.9	11.0
1200-1399	24.4	6.3	6.8	1200-1399	23.5	1.5	6.9
1400-1799	24.0	2.3	9.0	1400-1599	23.0	1.6	11.6
				1600-1799	18.5	4.7	8.0
1800-1999	31.6	3.9	13.4	1800-1999	14.5	0.0	7.0
2000-2199	27.2	6.5	7.7				
2200-2399	29.3	4.7	11.3	2200-2399	29.3	7.5	11.3
2400-2599	29.7	4.0	13.7				
				Over 2600	25.3	3.5	7.3

The data in Table 27 show that the average number of years of previous administrative experience of the principal tends to increase as the size of the high school increases up to and including the 400-599 enrollment interval for three year high schools, and up to and including the 800-999 enrollment interval for four year high schools. The average number of years of professional experience including both teaching and administration, and the average number of years in the present position does not appear to be related to the size of the high school.

4. Average Salary of Principals

The data showing the relationship between the size of the high school and the salary of the high school principal are presented in Table 28.

Table 28

Average Salary of Principals

Three Year High Schools		Four Year High Schools	
Enrollment	Average Salary	Enrollment	Average Salary
0- 399	$ 8,446	0- 199	$ 6,386
		200- 399	7,389
400- 599	9,276	400- 599	8,491
600- 799	9,872	600- 799	9,136
800- 999	11.196	800- 999	9,981
1000-1199	11,408	1000-1199	10,962
1200-1399	12,206	1200-1399	11,236
1400-1799	13,118	1400-1599	11,017
		1600-1799	11,839
1800-1999	13,310	1800-1999	11,830
2000-2199	12,835		
2200-2399	13,379	2200-2399	12,495
2400-2599	15,713		
		Over 2600	11,919

The data in Table 28 show that the salary of the high school principal tends to increase as the size of the high school increases throughout most of the enrollment continuum. The data show a consistent increase in the principal's salary as the size of the high school increases up to and including the 1800-1999 enrollment interval for three year high schools, and up to and including the 1200-1399 enrollment interval for four year high schools.

5. Ratio of Teachers to Administrators

The data presented in Table 29 show the relationship between the size of the high school and the ratio of teachers to the principal; or in schools which have one or more assistant principals, the ratio of teachers to the principal and his assistant or assistants.

Table 29

Ratio of Teachers to Administrators

Three Year High Schools		Four Year High Schools	
Enrollment	Ratio	Enrollment	Ratio
0- 399	19.0 to 1	0- 199	11.8 to 1
		200- 399	17.4
400- 599	27.9	400- 599	24.3
600- 799	27.4	600- 799	28.2
800- 999	34.1	800- 999	28.5
1000-1199	32.2	1000-1199	29.5
1200-1399	34.3	1200-1399	29.4
1400-1799	38.6	1400-1599	40.4
		1600-1799	38.7
1800-1999	30.6	1800-1999	41.3
2000-2199	37.2		
2200-2399	35.4	2200-2399	40.7
2400-2599	51.1		
		Over 2600	40.0

The data in Table 29 show that the ratio of teachers to administrators tends to increase as the size of the high school increases up to and including the 1400-1799 enrollment intervals, beyond which there does not appear to be any consistent relationship to size. The data suggest that the larger high schools have attempted to keep the ratio below 40 to 1. The only group of schools with a much higher ratio were those three year high schools in the 2400-2599 enrollment interval. No specific recommendation was found in the literature concerning the ratio of teachers to administrators, but Anderson and Van Dyke reported that: "The trend appears to be in the direction of having a ratio of one administrator for every 500 pupils or major fraction thereof."[104] Relating this to a pupil-teacher ratio of 20 to 1 would mean a ratio of teachers to administrators of 25 to 1, which is considerably lower than the ratio maintained by many of the schools included in this study.

It should be noted that high schools with an enrollment of less than 400 students tend to have a much lower ratio of teachers to administrators than larger high schools. This fact undoubtedly contributes to the high per pupil cost for professional salaries which was reported earlier in this chapter for these schools.

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104. Anderson and Van Dyke, p. 12.

6. Summary of Findings from Examination of Administrative Factors

The data show that:

a. Four year high schools with an enrollment of less than 600 students tend to have a higher percentage of principals who do not have a Masters degree than larger high schools. All of the principals of the three year high schools included in this study had at least a Masters degree.

b. The number of years of previous administrative experience of the high school principal tends to increase as the size of the high school increases up to and including the 400-599 enrollment interval for three year high schools, and up to and including the 800-999 enrollment interval for four year high schools. The number of years of professional experience including both teaching and administration, and the average number of years in their present position does not appear to be related to the size of the high school.

c. The salary of the high school principal tends to increase as the size of the high school increases throughout most of the enrollment continuum. The increase was consistent up to and including the 1800-1999 enrollment interval for three year high schools, and up to and including the 1200-1399 enrollment interval for four year high schools.

d. The ratio of teachers to the principal or to the principal and his assistants tends to increase as the size of the high school increases up to and including the 1400-1799 enrollment intervals, beyond which there does not appear

to be any consistent relationship to the size of the high school.

e. High schools with an enrollment of less than 400 students tend to have a much lower teacher-principal ratio than larger high schools. This fact undoubtedly contributes to the high per pupil cost for professional salaries which was reported earlier in this chapter for these schools.

F. Building Factors

The building which houses a modern comprehensive high school must serve many facets. No attempt was made in this study to examine all of the building factors which might influence the effectiveness of the high school program. However, several factors were selected for examination which are representative of the various types of rooms and facilities that are considered important by many educators. For purposes of comparison an attempt was made to select some rooms and facilities which are not usually found in all high schools. No attempt was made to evaluate the selected rooms or facilities. The only comparison that was made was whether or not the high school plant included the selected rooms or facilities.

1. Percent of Schools with Auditorium

The data showing the relationship between the size of the high school and the percent of the high schools which have an auditorium are presented in Table 30. The data show that the percent of schools with an auditorium tends to increase as the size of the high school increases throughout

most of the enrollment continuum, but the increase is not consistent.

Table 30

Percent of Schools with Auditorium

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	16.7	0- 199	41.7
		200- 399	21.3
400- 599	12.5	400- 599	29.0
600- 799	50.0	600- 799	31.6
800- 999	62.5	800- 999	47.8
1000-1199	54.5	1000-1199	57.1
1200-1399	77.8	1200-1399	60.0
1400-1799	57.1	1400-1599	80.0
		1600-1799	33.3
1800-1999	77.8	1800-1999	100.0
2000-2199	83.3		
2200-2399	100.0	2200-2399	100.0
2400-2599	100.0		
		Over 2600	75.0

2. Percent of Schools with Guidance Facilities

The data showing the relationship between the size of the high school and the percent of schools in each enrollment interval with guidance facilities are presented in Table 31. The data show that the percent of schools with guidance facilities tends to increase as the size of the high school increases up to an enrollment of about 1000.

3. Percent of Schools with Gymnasium

The data showing the relationship between the size of the high school and the percent of high schools in each enrollment interval that have a gymnasium are presented in

Table 31

Percent of Schools with Guidance Facilities

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	83.3	0- 199	33.3
		200- 399	68.1
400- 599	87.5	400- 599	83.9
600- 799	83.0	600- 799	89.5
800- 999	100.0	800- 999	95.7
1000-1199	100.0	1000-1199	100.0
1200-1399	100.0	1200-1399	80.0
1400-1799	85.7	1400-1599	60.0
		1600-1799	66.7
1800-1999	100.0	1800-1999	100.0
2000-2199	100.0		
2200-2399	100.0	2200-2399	100.0
2400-2599	100.0		
		Over 2600	100.0

Table 32

Percent of Schools with Gymnasium

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	100.0	0- 199	100.0
		200- 399	93.6
400- 599	100.0	400- 599	93.5
600- 799	100.0	600- 799	94.7
800- 999	87.5	800- 999	100.0
1000-1199	100.0	1000-1199	100.0
1200-1399	100.0	1200-1399	100.0
1400-1799	100.0	1400-1599	100.0
		1600-1799	100.0
1800-1999	100.0	1800-1999	100.0
2000-2199	100.0		
2200-2399	100.0	2200-2399	100.0
2400-2599	100.0		
		Over 2600	100.0

Table 32. The data show that all of the high schools in the sample with an enrollment of 1000 or more have gymnasiums, and that only a very few smaller high schools do not have a gymnasium. Thus there would appear to be very little, if any, relationship to the size of the high school.

4. Percent of Schools with Swimming Pool

The data showing the relationship between the size of the high school and the percent of schools in each enrollment interval with a swimming pool are presented in Table 33. The data show that the percent of schools with a swimming pool increases as the size of the high school increases up to an enrollment of about 2000 students.

Table 33

Percent of Schools with Swimming Pool

Three Year High Schools		Four Year High Schools	
Enrollment	Percent	Enrollment	Percent
0- 399	16.7	0- 199	0.0
		200- 399	2.1
400- 599	12.5	400- 599	4.8
600- 799	8.3	600- 799	10.5
800- 999	37.5	800- 999	21.7
1000-1199	45.5	1000-1199	28.6
1200-1399	55.6	1200-1399	60.0
1400-1799	57.1	1400-1599	40.0
		1600-1799	66.7
1800-1999	88.9	1800-1999	100.0
2000-2199	50.0		
2200-2399	100.0	2200-2399	100.0
2400-2599	100.0		
		Over 2600	75.0

5. Average Age of Original Building and Additions

The data presented in Table 34 show the relationship between the size of the high school and the average age of the high school building. For buildings to which additions had been added to the original building, the average age of the entire building was determined by multiplying the number of classrooms in each portion of the building by the date of construction of that particular portion of the building, and then dividing the sum of these products by the total number of classrooms in the entire building.

Table 34

Average Age of Original Building and Additions

Three Year High Schools		Four Year High Schools	
Enrollment	Average Age	Enrollment	Average Age
0- 399	23	0- 199	22
		200- 399	21
400- 599	15	400- 599	16
600- 799	22	600- 799	14
800- 999	13	800- 999	15
1000-1199	19	1000-1199	17
1200-1399	15	1200-1399	12
1400-1799	13	1400-1599	20
		1600-1799	18
1800-1999	20	1300-1999	4
2000-2199	22		
2200-2399	22	2200-2399	28
2400-2599	24		
		Over 2600	13

The data in Table 34 do not indicate any relationship between the size of the high school and the average age of the high school building.

6. Summary of Findings from Examination of Building Factors

The data show that:

a. The percent of high schools with an auditorium tends to increase as the size of the high school increases throughout most of the enrollment continuum, but the increase is not consistent.

b. The percent of high schools with guidance facilities tends to increase as the size of the high school increases up to an enrollment of about 1000 students, beyond which there appears to be little, if any relationship to the size of the high school.

c. All of the schools in the sample with an enrollment of 1000 or more students have a gymnasium, and only a very few smaller schools do not have a gymnasium. Thus there would appear to be little, if any, relationship to size.

d. The percent of high schools that have a swimming pool tends to increase as the size of the high school increases up to an enrollment of about 2000 students, beyond which there appears to be little, if any, relationship to size.

e. There appears to be little, if any, relationship between the size of the high school and the age of the high school buildings.

CHAPTER IV

TEST OF HYPOTHESIS

The hypothesis examined in this study was that up to a certain size range the size of the high school is inversely related to per pupil cost and directly related to the quality of the educational program; but beyond this size range, size has little, if any, relationship to either per pupil cost or the quality of the educational program.

For purposes of analysis the hypothesis was restated as a twofold hypothesis: (1) up to a certain size range the size of the high school is inversely related to per pupil cost; but beyond this size range, size has little, if any, relationship to per pupil cost; and (2) up to a certain size range the size of the high school is directly related to the quality of the educational program; but beyond this size range; size has little, if any, relationship to the quality of the educational program.

I. Cost Factors

That part of the hypothesis pertinent to the cost factors was found to be true for the two applicable cost factors examined for both three and four year high schools. (There were four cost factors but only two of them were applicable to the hypothesis.) The size range for each cost factor for which the hypothesis was found to be true is shown in Table 35.

Table 35

Test of Hypothesis for Cost Factors

Cost Factors	True	Not True	Not Applicable	Size Range
Three Year High Schools				
A	X			0- 800
B	X			0-1000
C			X	
D			X	
Four Year High Schools				
A	X			0- 400
B	X			0-1000
C			X	
D			X	

II. Assumed Effectiveness Factors

That part of the hypothesis pertinent to the assumed effectiveness factors was found to be true: (a) for all four of the institutional factors examined for three year high schools, and for three of the four institutional factors examined for four year high schools; (b) for two of the four library factors examined for three year high schools, and for one of the four library factors examined for four year high schools; (c) for four of the five pupil factors examined for three year high schools, and for all five of the pupil factors examined for four year high schools; (d) for six of the eleven applicable teacher factors examined for three year high schools, and for seven of the eleven applicable teacher

factors examined for four year high schools (There were twelve teacher factors examined counting subdivisions but one of them was not applicable to the hypothesis.); (e) for three of the six applicable administrative factors examined for three year high schools, and for four of the six applicable administrative factors examined for four year high schools (There were seven administrative factors examined counting subdivisions but one of them was not applicable to the hypothesis.); and (f) for one of the five building factors examined for three year high schools, and for two of the five building factors examined for four year high schools. The size range for each assumed effectiveness factor for which the hypothesis was found to be true is shown in Table 36.

III. Summary of Findings from Test of Hypothesis

The hypothesis was found to be true for both of the applicable cost factors examined for both three and four year high schools, and for 20 of the 35 applicable assumed effectiveness factors examined for three year high schools and 22 of the 35 applicable assumed effectiveness factors for four year high schools. The average size ranges for which the hypothesis was found to be true were for an enrollment from 0 to 865 for three year high schools and for an enrollment from 0 to 879 for four year high schools.

Table 36

Test of Hypothesis for Assumed Effectivness Factors

Three Year High Schools

Assumed Effectiveness Factors	True	Not True	Not Applicable	Size Range
A-1	X			0- 800
2	X			0- 600
3	X			0- 600
4	X			0- 800
B-1		X		
2		X		
3	X			0- 600
4	X			0- 800
C-1	X			0- 800
2	X			0- 600
3		X		
4	X			0- 600
5	X			0- 600
D-1	X			0-1200
2-a		X		
b	X			0- 600
c	X			0- 600
d	X			0- 600
e	X			0-1000
f	X			0- 800
3			X	
4		X		
5-a		X		
b		X		
6	X			0-1800
E-1		X		
2			X	
3-a		X		
b	X			0- 600
c		X		
4	X			0-2000
5	X			0- 600
F-1		X		
2	X			0- 600
3		X		
4		X		
5		X		

Table 36 (Continued)

Four Year High Schools

Assumed Effectiveness Factors	True	Not True	Not Applicable	Size Range
A-1	X			0-1000
2	X			0-1400
3	X			0-1000
4		X		
B-1		X		
2		X		
3		X		
4	X			0-1000
C-1	X			0-1200
2	X			0- 600
3	X			0- 800
4	X			0-1000
5	X			0- 400
D-1	X			0-1200
2-a	X			0-1000
b	X			0-1200
c	X			0-1000
d	X			0-1400
e	X			0- 800
f		X		
3			X	
4		X		
5-a		X		
b		X		
6	X			0-1600
E-1	X			0- 600
2			X	
3-a		X		
b	X			0-1000
c		X		
4	X			0-1400
5	X			0-1200
F-1		X		
2	X			0-1200
3		X		
4	X			0-1400
5		X		

CHAPTER V

RESUME OF FINDINGS RELEVANT TO OPTIMUM SIZE

The primary purpose of this study was to determine if there is an optimum size for the high school in Michigan. This chapter is devoted to a summarization and analysis of the findings presented in Chapter III to determine if the data indicate a particular enrollment range which tends to provide a high quality educational program as measured by the assumed effectiveness factors, and beyond which no substantial reduction in per pupil cost or improvement in the quality of the educational program is realized by any further increase in size.

I. Cost Factors

The data presented in Table 37 show the rank of each enrollment interval in relation to the other enrollment intervals for the two applicable cost factors examined. A grade of one indicates that enrollment interval was lowest in per pupil cost for that particular cost factor. Thus the total lowest score indicates the lowest overall cost rating. The data show that the per pupil cost tends to decrease as the enrollment of the high school increases up to and including the 300-999 enrollment interval for both three and four year high schools, beyond which there does not appear to be any consistent relationship to size. A graphic presentation of this data is shown in Figure 1.

Table 37

Rank by Enrollment Interval for Each Cost Factor

Three Year High Schools

Factor	Enrollment Interval										
	0 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1799	1800 - 1999	2000 - 2199	2200 - 2399	2400 - 2599
A	9	4	3	5	7	6	11	8	2	1	10
B	11	10	9	5	8	7	6	4	3	2	1
Totals	20	14	12	10	15	13	17	12	5	3	11

Four Year High Schools

Factor	Enrollment Interval										
	0 - 199	200 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1599	1600 - 1799	1800 - 1999	2200 - 2399	Over 2600
A	12	3	5	4	2	8	10	11	9	6	7	1
	12	11	10	2	6	8	7	4	3	5	2	1
Totals	24	14	15	13	8	16	17	15	12	11	9	2

Figure I: Cost Rank by Enrollment Interval

Three Year High Schools

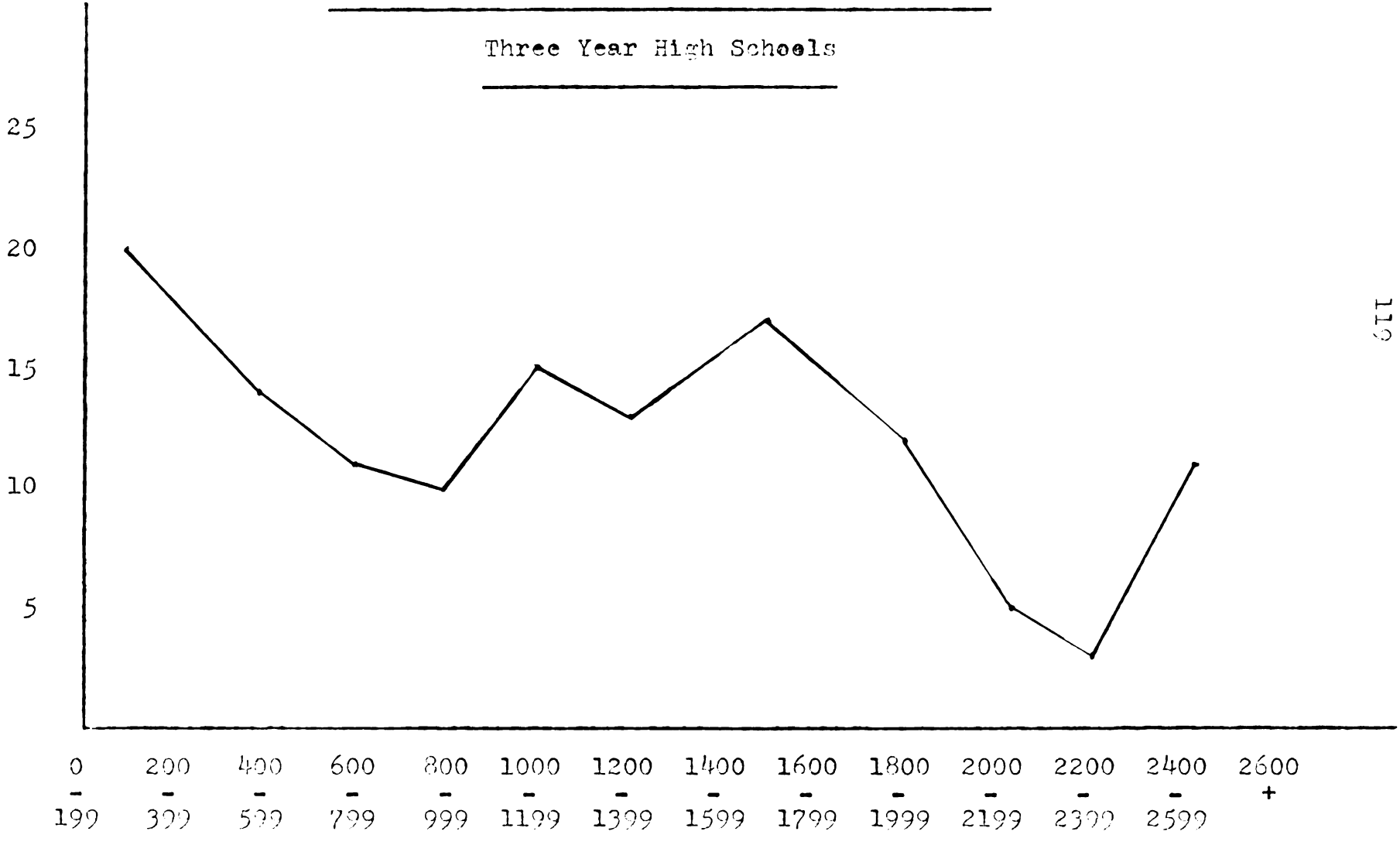


Figure I (Continued): Cost Rank by Enrollment Interval

Four Year High Schools

II. Assumed Effectiveness Factors

The data presented in Table 33 show the quality rank of each enrollment interval in relation to the other enrollment intervals for each applicable assumed effectiveness factor examined. A grade of one indicates that enrollment interval was highest in quality for that particular assumed effectiveness factor. Thus the total lowest score indicates the best overall quality rating. No claim is made that all of the factors examined should have equal weight. Various educators would undoubtedly assign more importance to some factors than others. However, Table 33 does present comparative quality ratings based on the combination of many factors. The data show that when all of the factors are considered the general quality of educational program as measured by the assumed effectiveness factors tends to improve as the size of the high school increases up to and including the 1000-1199 enrollment interval, with a marked improvement in this interval, for both three and four year high schools; beyond which there does not appear to be any consistent relationship to size. It should be noted, however, that three year high schools in the 1400-1799, 2200-2399, and 2400-2599 enrollment intervals; and four year high schools in the 2200-2399 enrollment interval ranked equally high or higher in quality as measured by the assumed effectiveness factors. A graphic presentation of this data is shown in Figure 2.

Table 33

Quality Rank by Enrollment Interval for Each Assumed Effectiveness Factor

Three Year High Schools

Factor	Enrollment Interval										
	0 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1799	1800 - 1999	2000 - 2199	2200 - 2399	2400 - 2599
A-1	4	3	2	1	1	1	1	1	1	1	1
2	11	9	10	7	8	5	2	3	4	6	1
3	7	3	6	3	5	4	8	3	2	6	1
4	7	7	5	9	4	8	2	6	3	10	1
B-1	6	2	4	7	5	6	3	8	9	9	1
2	1	1	3	2	5	8	6	7	4	4	8
3	Not Applicable										
4	10	11	9	7	3	2	4	8	5	6	1
C-1	Not Applicable										
2	3	11	5	8	9	7	1	4	6	10	2
3	6	8	7	2	4	11	3	10	5	9	1
4	11	5	9	4	2	8	3	7	10	6	1
5	4	1	6	8	3	7	2	11	9	10	5
D-1	11	10	9	8	6	7	3	2	5	4	1
2-a	10	11	6	3	3	5	4	2	9	7	1
b	3	11	9	2	8	7	5	6	10	4	1
c	11	4	5	10	8	6	7	1	2	9	3
d	6	2	4	2	3	1	2	4	5	1	1
e	4	3	3	2	3	3	2	2	2	1	1
f	5	4	2	3	1	1	1	6	1	1	1
3	Not Applicable										
4	1	10	7	4	2	8	11	3	9	6	5
5-a	10	11	8	6	5	9	7	3	4	1	2
b	9	10	8	6	4	8	5	2	3	1	7
6	11	10	9	8	7	6	2	3	4	5	1
E-1	1	1	1	1	1	1	1	1	1	1	1
2	Not Applicable										
3-a	7	10	11	9	4	6	8	1	5	3	2
b	11	8	10	5	4	2	9	7	1	3	6
c	6	10	11	9	1	8	5	3	7	4	2
4	11	10	9	8	7	6	4	3	5	2	1
5	Not Applicable										

Table 39 (Continued)

Factor	Enrollment Interval										
	0 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1799	1800 - 1999	2000 - 2199	2200 - 2399	2400 - 2599
F-1	8	9	7	4	6	3	5	3	2	1	1
2	4	2	5	1	1	1	3	1	1	1	1
3	1	1	1	2	1	1	1	1	1	1	1
4	9	10	11	8	7	5	4	3	6	1	1
5	6	2	5	1	3	2	1	4	5	5	7
Total	215	210	207	160	139	163	125	145	146	139	70

Four Year High Schools

Factor	Enrollment Interval										
	0 - 199	200 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1599	1600 - 1799	1800 - 1999	2200 - 2399	Over 2600
A-1	8	7	6	4	2	5	3	1	1	1	1	1
2	12	11	10	9	8	7	6	3	4	5	1	2
3	11	10	6	7	3	1	5	9	8	6	2	4
4	6	7	3	1	5	4	12	8	11	10	2	9
B-1	1	4	7	8	6	3	2	5	1	9	3	8
2	1	2	3	4	6	8	1	9	11	7	5	10
3	Not Applicable											
4	12	11	8	9	7	2	2	4	10	1	5	3
C-1	Not Applicable											
2	7	11	10	9	8	6	4	1	3	7	2	5
3	12	11	9	3	6	2	1	5	4	8	7	10
4	11	8	6	6	1	9	7	3	5	10	4	2
5	2	1	3	4	5	11	9	7	6	12	8	10
D-1	10	11	9	8	7	3	6	3	4	2	1	5
2-a	11	10	9	7	5	6	3	4	8	1	2	3
b	12	11	10	8	7	2	3	4	9	1	6	5
c	11	10	9	7	3	8	5	4	5	6	1	2
d	7	6	5	4	2	2	1	3	1	1	1	4
e	6	5	4	3	2	2	2	1	2	2	1	2
f	1	2	7	6	5	3	9	6	8	10	4	8
3	Not Applicable											

Table 38 (Continued)

Factor	Enrollment Interval											
	0 - 199	200 - 399	400 - 599	600 - 799	800 - 999	1000 - 1199	1200 - 1399	1400 - 1599	1600 - 1799	1800 - 1999	2200 - 2399	Over 2600
4	4	11	7	8	9	5	10	6	2	1	3	12
5-a	4	11	6	7	8	3	10	3	9	2	1	5
b	11	12	9	10	8	3	6	5	7	2	1	4
6	12	11	10	9	8	3	6	4	5	1	2	7
E-1	6	4	2	1	3	1	1	5	1	1	1	1
2					Not Applicable							
3-a	7	11	9	10	4	1	5	6	8	12	2	3
b	10	7	6	6	2	3	9	8	4	11	1	5
c	5	12	11	7	4	3	10	1	6	9	2	8
4	12	11	10	9	8	7	5	6	3	4	1	2
5					Not Applicable							
F-1	7	11	10	9	6	5	4	2	3	1	1	3
2	9	6	4	3	2	1	5	3	7	1	1	1
3	1	3	4	2	1	1	1	1	1	1	1	1
4	11	10	9	8	7	6	4	5	3	1	1	2
5	11	10	6	4	5	7	2	9	8	1	12	3
Total	251	268	227	200	163	138	159	149	173	147	86	150

Figure II: Quality Rank by Enrollment Interval

Three Year High Schools

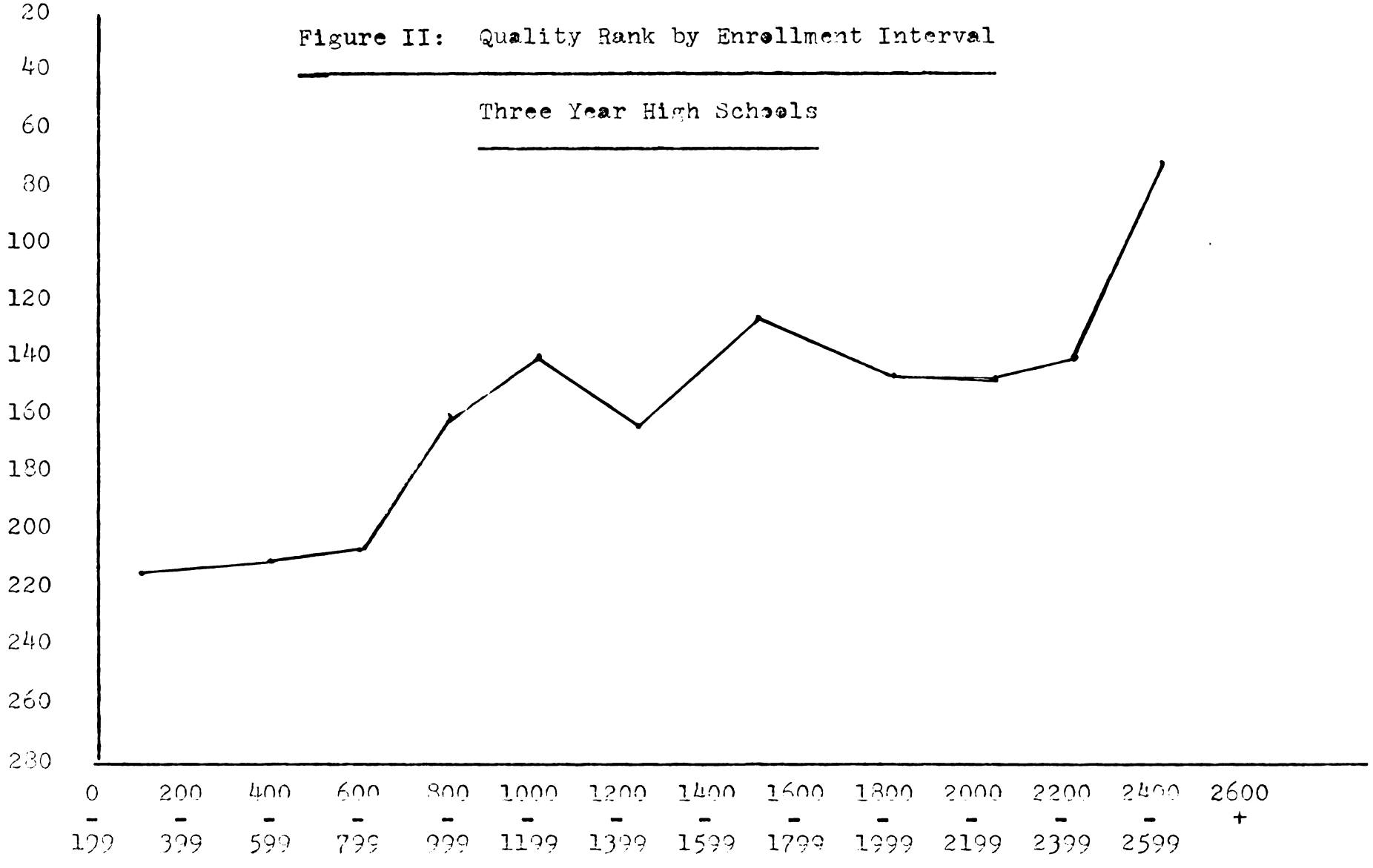
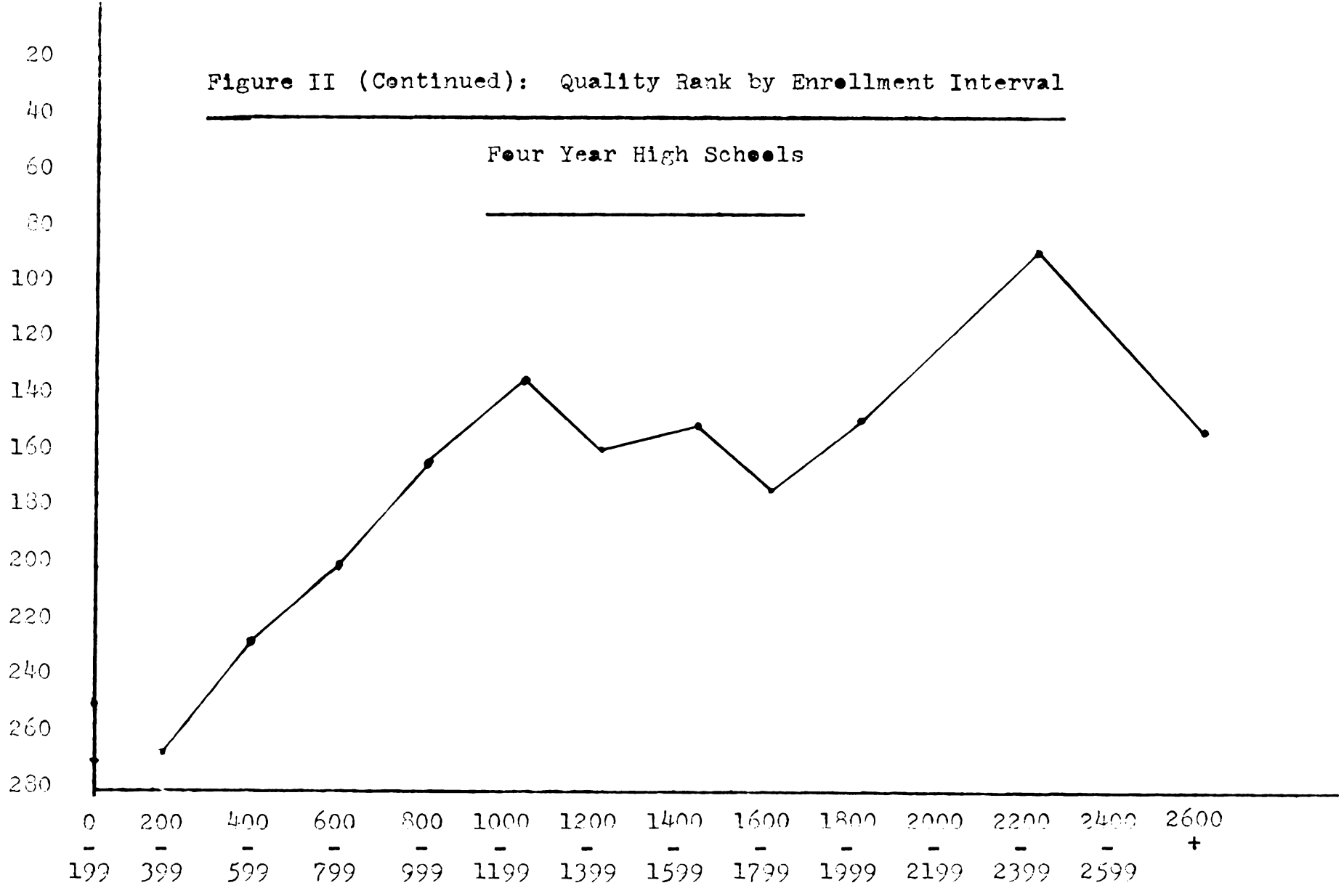


Figure II (Continued): Quality Rank by Enrollment Interval

Four Year High Schools



III. Summary of Findings Pertinent to Optimum Size

The data as presented in Table 39 show the rank of each enrollment interval in relation to the other enrollment intervals for the total cost rating as determined from the applicable cost factors and shown in Table 37, and for the total quality rating as determined from the applicable assumed effectiveness factors and shown in Table 38. A grade of one in the cost column indicates that enrollment interval was lowest in per pupil cost. A grade of one in the quality column indicates that enrollment interval was highest in quality.

Table 39

Rank by Enrollment Interval for Total Cost Rating and for Total Quality Rating

Three Year High Schools			Four Year High Schools		
Enrollment	Cost	Quality	Enrollment	Cost	Quality
0- 399	10	10	0- 199	11	11
			200- 399	7	12
400- 599	7	9	400- 599	8	10
600- 799	5	8	600- 799	6	9
800- 999	3	6	800- 999	2	7
1000-1199	8	3	1000-1199	9	2
1200-1399	6	7	1200-1399	10	6
1400-1799	9	2	1400-1599	8	4
			1600-1799	5	8
1800-1999	5	4	1800-1999	4	3
2000-2199	2	5			
2200-2399	1	3	2200-2399	3	1
2400-2599	4	1			
			Over 2600	1	5

Table 39 is essentially a summary of all of the preceeding tables in the study and the data as presented show the hypothesis of the study in tabular form. The data show that the per pupil cost is inversely related to the size of the high school as size increases up to and including the 800-999 enrollment interval for both three and four year high schools, and that the quality of the educational program is directly related to the size of the high school as size increases up to and including the 1000-1199 enrollment interval for both three and four year high schools; but beyond these size ranges, size does not appear to have any consistent relationship to either per pupil cost or the quality of the educational program.

The data indicates that size has a favorable influence on both per pupil cost and the quality of the educational program as enrollment increases up to an enrollment of 1000 students for both three and four year high schools. The data also indicates that a marked improvement in the quality of the educational program can be achieved in the 1000-1199 enrollment interval by increasing per pupil expenditure.

It must be noted that, although any further increase in size beyond the 1000-1199 enrollment interval does not appear to have any consistent relationship to either per pupil cost or the quality of the educational program, the highest quality program as measured by the assumed effectiveness factors occurred in the 2400-2599 enrollment interval for three year high schools and in the 2200-2399 enrollment interval for

four year high schools; and in both cases at a lower per pupil cost than in the 1000-1199 enrollment interval. However, it should also be noted that it was previously determined from the review of literature that the recommendations concerning the maximum size for the high school, which was defined for purposes of this study as that point on the enrollment continuum beyond which the undesirable factors related to bigness begin to outweigh the advantages gained over the small high school, tend to center around an enrollment range from 1500 to 2200 students.

Thus, although the data do not show a definite optimum size for the high school; which was defined for purposes of this study as that enrollment range which tends to provide a high quality educational program, and beyond which no substantial reduction in per pupil cost or improvement in the quality of the educational program is realized by any further increase in size; if the findings of this study are considered in conjunction with the findings from the review of the literature, it would appear that the 1000-1199 enrollment interval is the optimum size for the high school in Michigan.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of this study was to examine the relationship of secondary school size in selected Michigan high schools to per pupil cost and to the quality of the educational program as measured by certain assumed effectiveness factors, and thus to determine if there is an optimum size for the high school in Michigan.

A major limitation in a study of this type is the inability to examine all of the factors which might influence the quality of the educational program. Thus an extensive review of the literature and previous studies pertinent to the size of the high school was made in order to extend the scope of the study.

Summary of Principal Findings from the Literature

1. Much of the literature is critical of the small high school, but concern has also been expressed that high schools can be too big as well as too small to provide the best educational opportunities.

2. A definite relationship has not been established between the size of the high school and student achievement. Most of the studies that have investigated this question have used success in college as a measure of achievement. Some writers report that graduates of large high schools achieve better grades in college than graduates of small high schools.

But other writers report that when aptitude is held constant there does not seem to be any significant relationship between the size of the high school and the achievement of students.

3. Recommended minimum enrollments tend to center around an enrollment range from 300 to 500 students for a four year high school.

4. Much less has been written about the maximum size of the high school than about the minimum size. However, the recommended maximum enrollments that appear in the literature tend to center around an enrollment range from 1500 to 2200 students for a four year high school.

5. Few studies have been made to determine an optimum size for the high school. And there does not seem to be any unanimity of opinion on a particular size for the high school which tends to provide the best educational opportunities at a reasonable cost per pupil.

Summary of Principal Findings from the Study

The selected high schools were examined to determine the relationship, if any, of the size of the high school to per pupil cost as measured by certain cost factors; and to the quality of the educational program as measured by certain assumed effectiveness factors. The data show that:

1. High schools with an enrollment of less than 400 students tend to pay a premium per pupil cost for an inferior educational program.

2. High schools with an enrollment of less than 800 students tend to have a lower accreditation rating than larger high schools.

3. High schools with an enrollment of less than 600 students tend to provide less adequate guidance services than larger high schools.

4. High schools with an enrollment of less than 600 students tend to have a higher percentage of teachers teaching in subject areas in which they do not have a teaching major than larger high schools.

5. The per pupil cost is inversely related to the size of the high school as size increases up to and including the 800-999 enrollment interval for both three and four year high schools, and the quality of the educational program is directly related to the size of the high school as size increases up to and including the 1000-1199 enrollment interval for both three and four year high schools; but beyond these enrollment intervals, size does not appear to have any consistent relationship to either per pupil cost or the quality of the educational program.

Conclusions

1. The hypothesis that up to a certain size range the size of the high school is inversely related to per pupil cost and directly related to the quality of the educational program; but beyond this size range, size has little, if any, relationship to either per pupil cost or the quality of the

educational program was accepted as being generally true up to an enrollment range from 800 to 1200 students.

2. The findings of this study indicate that the 1000-1199 enrollment interval is the size range which appears to best satisfy the definition of the optimum size of the high school as that enrollment range which tends to provide a high quality educational program, and beyond which no substantial reduction in per pupil cost or improvement in the quality of the educational program is realized by any further increase in size.

It must be noted that although any further increase in size beyond the 1000-1199 enrollment interval does not appear to have any consistent relationship to either per pupil cost or the qualtiy of the educational program, the highest quality program as measured by the assumed effectiveness factors occurred in the 2400-2599 enrollment interval for three year high schools and in the 2200-2399 enrollment interval for four year high schools; and in both cases at a lower per pupil cost as measured by the selected cost factors than in the 1000-1199 enrollment interval. However, it should also be noted that it was determined from the review of literature that the recommendations concerning the maximum size of the high school, which was defened for purposes of this study as that point on the enrollment continuum beyond which the undesirable factors related to bigness begin to outweigh the advantages gained over the small high school, tend to center around an enrollment range from 1500 to 2200 students.

Therefore, if the findings of the study are considered in conjunction with the findings from the review of the litture, it seems logical to conclude that the optimum size for the high school in Michigan is within an enrollment range from 1000 to 1200 students.

Recommendations

1. It is recommended that the findings of this study and other studies pertinent to the size of the high school be considered when decisions affecting the size of the high school have to be made.

2. It is recommended that school districts in Michigan which are maintaining high schools with an enrollment of less than 400 students in grades nine through twelve study the possibility of reorganizing their school district or of consolidating with other school districts, so the maintenance of a larger high school will be possible.

3. It is recommended that school districts in Michigan which are maintaining, or anticipate that they will soon be maintaining high schools with an enrollment much larger than 1200 students continue to evaluate their high school program carefully; and that they define an optimum high school enrollment for their community.

4. It is recommended that further study be made of the influence of the size of the high school on per pupil cost and the quality of the educational program in Michigan high schools, especially as enrollment increases beyond 1200 stu-

dents; and with emphasis on such factors as: (a) the impact of size on the individual student's attitude toward school, (b) the influence of size on pupil-teacher relationships, (c) the influence of size on the teachers' dedication to the school and to their profession, and (d) the influence of size on school-community relations.

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