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SCHOOL SIZE AND PROGRAM QUALITY IN SOUTHERN HIGH SCHOOLS.

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PUB DATE JAN 66

EDRS PRICE MF-$0.18 HC-$2.60 65P.

DESCRIPTORS- *SCHOOL SIZE, SOUTHERN SCHOOLS, *HIGH SCHOOLS, SECONDARY EDUCATION, TEACHER QUALIFICATIONS, TEACHER CERTIFICATION, TEACHER EXPERIENCE, TEACHING LOAD, *PROGRAM EVALUATION, STUDENT ENROLLMENT, *CURRICULUM, STUDENT TEACHER RATIO, CLASS SIZE, EDUCATIONAL QUALITY, SCHOOL REDISTRICTING, SMALL SCHOOLS, SPECIALISTS, *GRADE ORGANIZATION, NASHVILLE

SCHOOL SIZE AND ORGANIZATIONAL PATTERNS WERE INVESTIGATED AND DETERMINED TO BE BASIC INFLUENCES AFFECTING THE QUALITY OF SECONDARY EDUCATION IN 11 SOUTHERN STATES. DATA WERE OBTAINED FROM OFFICIAL RECORDS FOR THE 1962-63 SCHOOL YEAR ON FILE IN STATE DEPARTMENTS OF EDUCATION IN EACH OF THE 11 STATES. DATA AREAS UTILIZED WERE (1) EXTENT OF CURRICULAR OFFERINGS, (2) QUALITY OF INSTRUCTIONAL PERSONNEL, (3) TEACHING LOAD, AND (4) SCHOOL SIZE AND ORGANIZATIONAL PATTERN. THE FINDINGS OF THE STUDY SUGGESTED THAT SCHOOLS WITH AN ENROLLMENT OF UNDER 500 OFFERED FEWER SUBJECT AREAS, FEWER COURSES PER SUBJECT AREA, AND FEWER TOTAL COURSES. TEACHERS IN SCHOOLS WITH AN ENROLLMENT GREATER THAN 500 WERE BETTER TRAINED AND THEIR TEACHING LOAD WAS MORE DESIRABLE. TEACHING EXPERIENCE WAS THE ONLY CRITERION CONSIDERED WHICH DID NOT JUSTIFY THE SUPERIORITY OF LARGE SCHOOLS, SINCE LENGTH OF EXPERIENCE WAS NOT FOUND TO BE RELATED TO SCHOOL SIZE OR ORGANIZATIONAL PATTERN. FINALLY, SCHOOL SIZE AND ORGANIZATIONAL PATTERN WERE INVERSELY RELATED (AS SCHOOL SIZE INCREASED, THE GRADE SPAN OF THE ORGANIZATIONAL PATTERN DECREASED) AND INSTRUCTIONAL PROGRAM ADEQUACY WAS A FUNCTION OF BOTH. THIS DOCUMENT IS ALSO AVAILABLE FROM THE CENTER FOR SOUTHERN EDUCATION STUDIES, BOX 164, GEORGE PEABODY COLLEGE FOR TEACHERS, NASHVILLE, TENNESSEE 37203, FOR $1.50. (GB)

SCHOOL SIZE AND PROGRAM QUALITY IN SOUTHERN HIGH SCHOOLS

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Contents

Foreword

From 1890 to 1920 high school enrollments in the United States doubled every decade. During these thirty years the expansion of school opportunities resulted from two primary forces: the wide acceptance of rural school equalization programs; and the creation of new high school centers within walking distance of most youth. The programs of these schools were shaped largely by the influences of college entrance requirements and regional accrediting agencies—both dominated by the leadership in higher education.

The next thirty years witnessed an end to the trend. The primary forces were the improvement of roads and travel concurrent with the rapid development of the modern automobile and bus. Thus, from 1920 to 1950 the phenomenal expansion was in the proportion of youth served by school transportation. The advent of mass pupil transportation eliminated the earlier justification for having small high schools within five or ten miles of each other, but consolidations lagged.

Now we are at the midpoint of the next thirty-year generation. In the fifteen years which have elapsed since 1950 several forces have been in motion—still without much change in the organization and location of high schools generally. Among these have been increasing participation of average citizens in studying school problems, increasing appreciation of the importance of more and better education for youth, and increasing expectations that public high schools shall serve all youth. These forces resulted in significant federal legislation in 1965, some of which strongly suggests apprehension and doubt that high schools are meeting expectations.

College and university leadership has increased its influence upon the college preparatory curriculum during

the past decade. A companion concern for the youth who will enter the labor force after high school has not been strong in academic circles. At long last these school-disadvantaged young Americans have their spokesmen—in the powerful and influential leaders among industry, business, labor, and government. These leaders are saying that non-college-bound youth shall be given an equitable opportunity—outside of existing high schools if these will not provide it—for an educated labor force is essential.

It remained for Dr. Joe L. Jackson to determine conclusively and beyond debate that the majority of small high schools in the South *cannot* afford equivalent educational offerings for both college entrance and work preparation. In this monograph he presents the definite and indisputable facts. The issue is clearly laid out in the open: the critical need to replace the 1890-1920 pattern of high school dispersion with a general reorganization during the remaining half of this generation.

The people of the South want good schools. Their understanding of quality in education is gauged by their own school experiences and by how they are kept informed by their school leaders. The burden of leadership for reform in secondary education, therefore, rests upon the shoulders of state and local school boards and their professional school personnel. Dr. Jackson and the staff of the Center for Southern Education Studies hope that this bulletin will be a source of challenge, encouragement, and service to them.

Director

January 1966

CHAPTER 1

Introduction

An ideal of American public education is equality of educational opportunity for all youth. Specifically, this implies an obligation on the part of school leaders of providing educational programs that will assure opportunity for maximal development of the full potentialities of each student. Although this ideal has never been fully attained, it serves as a goal toward which educators strive.

There is a great deal of evidence to suggest that one of the most serious deterrents to the attainment of this goal stems from the inability of small schools to provide a satisfactory educational program. This observation appears to be particularly applicable to secondary education. Some authorities express the belief that only large high schools are able to offer an effective and comprehensive program of education at reasonable cost. Others maintain that size alone is not a valid indicator of school quality.

DOES SCHOOL SIZE AFFECT PROGRAM QUALITY?

What criteria denote school quality? Opinions differ. While authorities accept the fact that numerous factors may contribute to the overall "goodness" of a school, no consensus has been reached concerning a specific list of these characteristics and the degree to which each may affect school quality. It is agreed, however, that certain aspects of school quality—e.g., the adequacy of the instructional program—may be influenced by factors such as professional training and certification of teachers, teaching load, and scope of the curricular program.

Teacher Preparation and Certification

One of the most fundamental characteristics of a satisfactory school is the provision of classroom instruction by competent, qualified teachers who are specially prepared in the areas in which they teach. The American Association of School Administrators (1958) underscored this fact by asserting that there should be at the high school level a properly certificated teacher for each subject matter class. While certification is not necessarily synonymous with competence, it may be assumed that a teacher who has had sufficient professional preparation for certification in a given area should be more competent than a teacher who has not had specialized training, other factors being equal.

The relationship of school size to certain teacher characteristics has been explored to some extent. Results of these investigations indicate that small schools do not fare as well as large schools on the basis of teacher preparation and certification. Kowitz and Sayres (1959) reported an extensive investigation of size, cost, and educational opportunity in New York secondary schools. Their findings revealed that, in general, small schools

were staffed with a lower proportion of teachers having master's degrees or beyond than were the larger schools. Collinsworth (1961), in a study of Arkansas high school teachers, found that larger schools had a higher proportion of teachers with advanced degrees and a smaller proportion of teachers with emergency or substandard certificates. Similar findings are reported in numerous other studies in this area.

Teaching Load

A teacher's effectiveness—and thus the effectiveness of the instructional program of which he is a part—is influenced to a considerable degree by the extent and nature of his total teaching assignment—i.e., his teaching load. Since teaching load is generally understood to include all the time and energy a teacher expends in the performance of his duties as a teacher, a variety of separate elements contribute to his total work load. These include: (1) class size; (2) pupil-teacher ratio; (3) total number of pupils taught daily; (4) number of class periods taught daily; (5) number of different subjects taught; and (6) extracurricular assignments.

Most aspects of teaching load have been rather extensively investigated. Since 1903, for example, more than 250 writings have dealt with the question of class size.

Although total teaching load probably is heavier in small high schools than in large, the evidence is not in complete agreement on this point. Shellhammer (1955), in a survey of 11,871 California high school teachers, revealed that classes in large high schools tended to average approximately eight more pupils per class than did classes in small schools. The same survey, however, disclosed that only one-third of the teachers in small high schools

had a daily preparation period, as compared with two-thirds of the teachers in large high schools. Results of studies conducted in Minnesota (Quanbeck and Douglass, 1935) and in Montana (Douglass, 1936) indicated that teachers in the small schools generally had heavier teaching loads than their counterparts in large schools.

Program Scope and Quality

The scope of school educational programs is usually defined in terms of the number and types of course offerings, special services, and pupil activities provided by the school. The terms "scope" and "quality," although not presumed synonymous, are closely related as they apply to school programs. Schools whose curricular programs are limited to a few watered down college-preparatory offerings do not provide the broad range of learning experiences necessary in meeting the needs of today's youth —particularly noncollege-bound youth.

The relationship between the size of high schools and the scope of their curricular programs has been definitely established by research. The following quotation from the report of *Project Talent* (1962) is representative of research opinion in this area:

> It would seem that larger school size is a proper and important objective in order to provide a greater variety and depth of course offerings and to make available special services such as grouping, acceleration, guidance, etc. . . . Size of school is very important insofar as it controls course offerings and services.

The classic study of local school units by Dawson (1934) was a pioneer venture in research on school size and program effectiveness. His efforts paved the way for subsequent investigations and influenced the determina-

tion of criteria of adequacy for several decades. Among his conclusions, Dawson reported that enrollment size exerted a considerable influence on the efficiency of a school. Three years later Seyfert (1937) reached similar conclusions in an exhaustive comparison of large and small high schools. He found that schools of limited enrollment provided programs of studies and pupil activities that were less extensive in scope than those provided by larger schools.

More recent studies of the relationship between high school size and program adequacy have served to corroborate the earlier findings of Dawson and Seyfert. Studies reported by Woodham (1951) and by Brown (1956) are typical of the relatively recent research in this area. Woodham's study of Florida high schools revealed a positive correlation between school size and breadth of educational opportunity. Basically similar findings were reported by Brown in his study of the relationship between the size of California high schools and the number of courses offered.

In most comparative studies of school size, schools have been evaluated in terms of what were assumed to be desirable characteristics of a school. By these criteria, small schools were usually found to be inferior. When schools were compared on the basis of pupil achievement as measured by test scores or grades received, however, the evidence in favor of large schools—although predominantly favorable—was less clear and decisive.

One of the earliest surveys of grades earned in college by graduates of large and small high schools was reported by Briggs (1919). The distribution of marks received during the freshman year in college revealed that graduates of large high schools earned a considerably higher percentage of A's and B's and a lower percentage

of D's and F's than did graduates of small high schools. It was found that scholarship generally increased with increases in school size.

More recently, Smith (1961) compared the achievement of a random sample of college-bound seniors enrolled in Arkansas high schools of various sizes. On the basis of ACT results, Smith concluded that Arkansas high schools which enrolled 400 or more pupils were graduating seniors who achieved at a significantly higher level of total educational development than seniors graduating from smaller schools. Similar results were obtained by Street, Powell, and Hamblen (1962); however, they suggested the possibility that a number of interrelated factors may have produced the apparent relationship between school size and pupil achievement which their study indicated.

What Size School Is Best?

The Research Division of the National Education Association (1944) defined the ideal school as one large enough to provide rich and varied educational experiences at reasonable cost, yet small enough for friendly, cooperative living. Although most school authorities agree with this definition, they have not always agreed on its translation into quantifiable terms. Answers to the question of ideal school size are largely opinions, either based on experience or derived from a particular philosophy of education. Estimates of optimum high school size range from pupil enrollments of 350 to well over 1,200, with the preponderance of opinion favoring an enrollment within the general range of from 500 to 750 as ideal (NEA, 1963).

A variety of factors influence the determination of ideal school size, as indicated by the following quotation:

> Desirable school size is determined by many factors, not all of which are present in every situation. If schools are rated on academic achievement of the students alone, little difference can be found between large and small schools. Today's schools, however, seek to do more than develop competence in the basic skills; they attempt to provide for individual differences, to promote vocational and social effectiveness, and to make available medical, testing, and counseling services. Such goals call for more and more special facilities and personnel, and school size has tended to increase. (NEA, 1963).

Within the past decade research recommendations have tended toward larger schools. Brown (1956) recommended a range of from 1,500 to 1,700 pupils as ideal for high schools; and Garcia (1961) advocated enrollments ranging from 1,000 to 1,400 for junior high schools of grades seven through nine. Smith (1960) concluded that the optimal size range for three- and four-year secondary schools in Ohio was from 800 to 1,200 pupils. Mayo (1962) stated that enrollments of fewer than 1,000 pupils were undesirable on the basis of curricular offerings. He indicated that enrollments ranging from 1,000 to 1,500 were more satisfactory, and that an enrollment of 2,000 represented maximum possibilities when educational advantages were reckoned only in terms of curricular offerings.

Edmonson, Roemer, and Bacon (1953) maintained that a high school justifies itself by the *quality* of its program, not by its size. According to these authorities, increases in size may be defended as long as the increase extends and enriches the offerings available to the pupils. They indicated that this condition ceases to exist at some point between enrollments of 1,500 and 2,500 pupils, at which point the extension in offerings tends to be dupli-

catory rather than different. Therefore, they set an enrollment of 2,000 as about the maximum for efficiency.

There is considerably greater agreement regarding desirable *minimum* high school size than is true in the case of *optimum* size. Dawson's (1934) proposals constituted the benchmark for recommended minimum enrollment for a number of years. He advocated an enrollment range of from 210 to 300 pupils as minimum for six-year high schools, and an enrollment range of from 175 to 250 pupils as minimum for senior high schools. Only recently have recommended minimum enrollments increased substantially beyond those proposed by Dawson more than thirty years ago.

Although desirable school size is generally expressed in terms of total pupil enrollment, at least one contemporary authority (Conant, 1959) specified a recommended minimum high school size in terms of the size of the graduating class. He emphatically asserted that "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."

Table 1 lists various recommendations concerning minimum high school size. Most authorities seem to agree that school enrollment may not fall much below 300 students without seriously impairing the effectiveness of the educational program. Except for the size recommended by Mayo (1962), Table 1 does not reveal a trend toward recommending increases in minimum school size, although no attempt was made to determine whether each writer simply repeated the recommendations of an earlier or original authority.

For the past three decades studies have emphasized the educational desirability of increasing the size of

TABLE 1

MINIMUM SIZES RECOMMENDED FOR SECONDARY SCHOOLS

Authority	*Year*	*Recommended Enrollment*	
		Absolute Minimum	*Desirable Minimum*
Ferris*	1933	250	400
Dawson*	1934	210	300
Gaumnitz	1934	200	300
New York Regents	1938	300	
Cowen and Coxe*	1940	300	350
Cooper	1943	300	
Bosley	1948	300	
National Commission on School District Reorganization	1948	300	
Minnesota Institute of Governmental Research	1949	150	
Woodham	1951	250	350
Mayo	1962	1,000	

Source: National Education Association, Research Division, "Efficient School Size," Research Memo 1963-5 (Washington: The Association, February, 1963), pp. 6-7.

*Recommendation refers to six-year high schools.

schools. Significant changes in size of high schools are indicated in Table 2, which shows the number of high schools in various enrollment categories for selected years since 1930. Despite the fact that the number of small high schools has decreased appreciably, more than one-half of the schools enroll fewer than 300 pupils—the minimum recommended by numerous authorities. Approximately 1,500,000 young Americans are enrolled in these schools. If it is true that these youths are being deprived of the kinds of educational experiences they need, steps should be taken to remedy the situation. If, on the other hand, no significant relationship exists between school size and program adequacy, school leaders—as well as critics of small high schools—should be presented with the facts.

TABLE 2

NUMBER AND PER CENT OF PUBLIC SECONDARY DAY SCHOOLS, BY ENROLLMENT, 1930 TO 1959

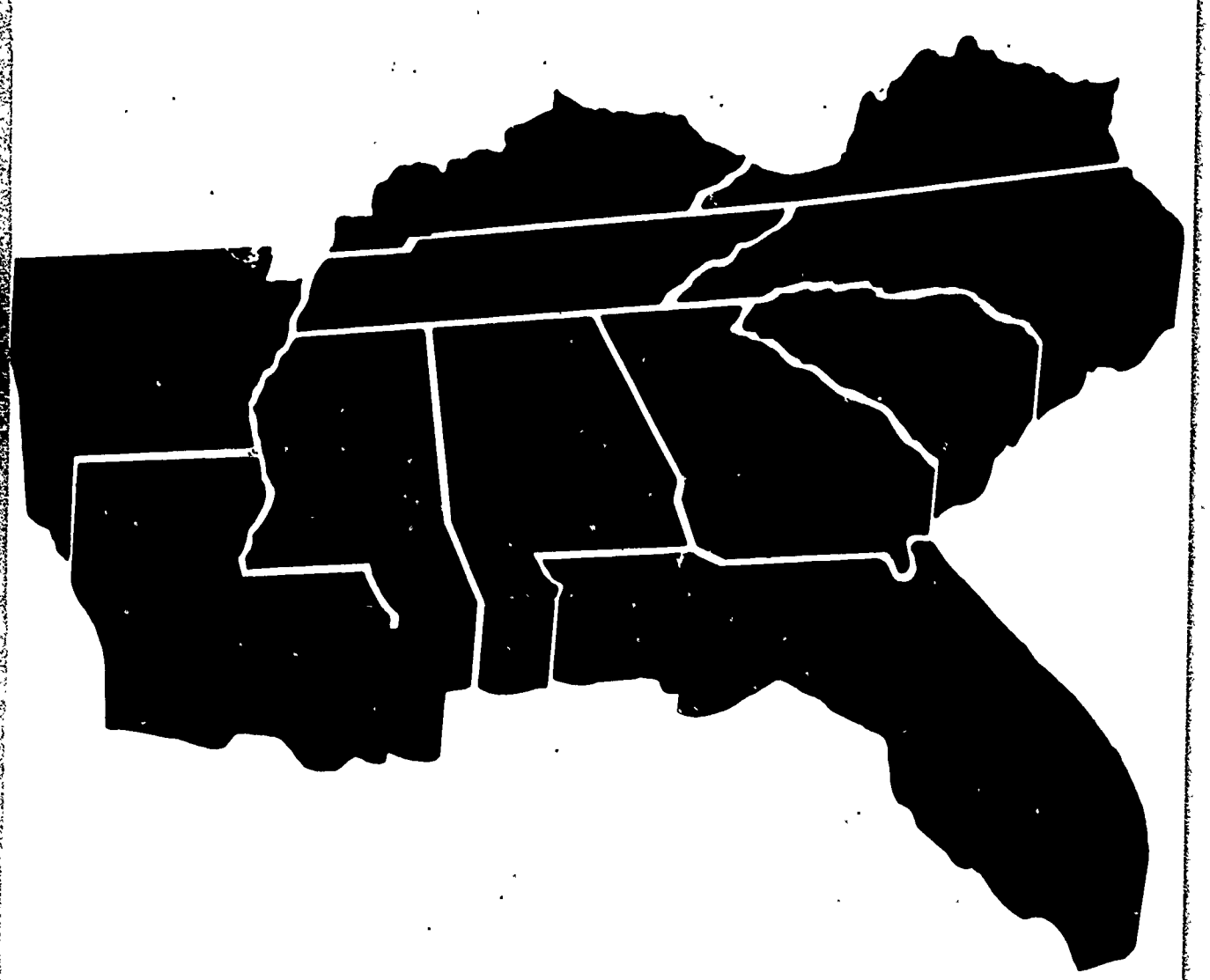
Enrollment	1930		1946		1952		1959	
	Number of schools	Per cent of total	Number of schools	Per cent of total	Number of schools	Per cent of total	Number of schools	Per cent of total
1-9	[a]	[a]	234	1.0	184	0.8	39	0.2
10-24	2,077	9.3	975	4.0	640	2.7	216	0.9
25-49	3,866	17.4	2,685	11.1	1,896	8.0	1,010	4.2
50-74	3,521	15.8	3,116	12.9	2,311	9.7	1,478	6.1
75-99	2,543	11.4	2,547	10.6	2,086	8.8	1,513	6.2
100-199	4,603	20.7	5,917	24.5	6,025	25.4	5,210	21.5
200-299	1,633	7.4	2,641	11.0	3,103	13.0	3,386	14.0
300-499	1,478	6.7	2,370	9.8	3,106	13.1	4,009	16.5
500-599	1,421	6.4	2,200	9.1	2,757	11.6	4,528	18.7
1,000-2,499	934	4.2	1,303	5.4	1,536	6.5	2,652	10.9
2,500-4,999	134	0.6	122	0.5	97	0.4	181	0.7
5,000 or more	27	0.1	12	0.1	5	[b]	4	[b]
Total	22,237	100.0	24,122	100.0	23,746	100.0	24,226[c]	100.0

Source: United States Department of Health, Education and Welfare, Office of Education, "Public Secondary Schools," *Statistics of Education in the United States*, 1958-59 Series No. 1 (Washington: Government Printing Office, 1961), 7.

[a] Data not tabulated.

[b] Less than 0.05 per cent.

[c] Includes 36 schools in Alaska but none in Hawaii.



CHAPTER 2

Design and Scope of the Study

The research evidence presented in the preceding chapter emphasizes school size as a basic issue in secondary education. This fact, combined with the current interest in "quality" education, the problems arising in connection with the deluge of inadequately prepared high school dropouts who are flooding the labor market, and the need for a redefinition of criteria of adequacy in high schools, prompted the present study.

The specific purpose of this study was to examine the relationship between the size of southern high schools and selected indicators of instructional program adequacy. A corollary purpose was to derive a basis for recommended minimum and optimum size ranges.

Although various studies have been conducted which relate school size to certain factors, most recent research efforts have largely omitted the South as a basis for area-wide focus. No prior study as comprehensive in scope as the present one is known to have been conducted for the entire southern region. The present study should not only shed additional light on current conditions in southern secondary education, but should also provide the basis for sounder approaches to school organization and program building. Appropriate implications of the study for attaining these ends are discussed in the final chapter of this report.

SOURCE OF DATA

This research is an integral part of an extensive study of southern secondary education conducted under the auspices of the Center for Southern Education Studies, George Peabody College for Teachers. Its scope embraces the entire southern region and includes a total of 4,773 public senior high schools,* having a combined total enrollment of 2,318,449 pupils, in the following states: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

Data used in the study were based on the 1962-63 school year and were obtained from official records—largely annual accreditation reports—on file in the state department of education in each of the eleven states stud-

*Public senior high school refers to a high school which has a twelfth grade.

ied. Choice of data hinged on two primary considerations: (1) their acknowledged relationship to program adequacy, as revealed in a survey of the literature in the area of concern; and (2) their availability in quantifiable, uniformly-recorded form in each state department of education. The following areas were selected:

1. Extent of curricular offerings
2. Professional training, experience, and certification of teachers
3. Teaching load, as measured by class size, pupil-teacher ratio, and number of pupils taught daily.

PROCEDURE

The schools were first grouped into size categories on the basis of total enrollment. Then, because of the multiplicity of grade organizational patterns in the various states and the need to provide a more realistic basis for comparing and analyzing the factors to be studied, the schools were grouped by organizational pattern: grades 7-12, grades 8-12, grades 9-12, and grades 10-12. Schools including grades 1-12 were classified according to the official state policy governing the designation of high school grades. The following total enrollment ranges were used to determine the size categories within which the schools were grouped:

Group	*Total Enrollment*
I	99 or fewer
II	100-249
III	250-499
IV	500-999
V	1,000-1,499
VI	1,500-1,999
VII	2,000 or more

Tabulations were made for the following specific characteristics of each of the 4,773 schools studied:

1. Extent of curricular offerings above the eighth grade level, expressed as:
   a. The total number of subject areas offered
   b. The number of courses offered in each subject area
   c. The total number of courses offered
2. Level of teacher training, expressed as the percentage of the professional staff in each of the following training categories:
   a. Fewer than four years of college
   b. Bachelor's degree
   c. Master's degree or beyond
3. Percentage of pupils taught by noncertificated teachers
4. Teacher experience
5. Pupil-teacher ratio
6. Class size
7. Number of pupils taught daily per teacher, obtained by dividing the total enrollment of all classes in each school by the total number of teachers in each school.

Automatic data processing was utilized in assimilating and compiling the information used in this study. A descriptive analysis, which included tables, graphs, and descriptive statistics, was made of the raw data. The mu-

tuality of relationship between school size and certain factors was measured by use of the following formula:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N}}{\sqrt{\left[\Sigma X^2 - \frac{(\Sigma X)^2}{N}\right]\left[\Sigma Y^2 - \frac{(\Sigma Y)^2}{N}\right]}}$$

In determining recommended enrollment ranges, lines of "best fit" were derived by the method of least squares according to the following linear regression equation:

$$\tilde{Y} = a + bX$$

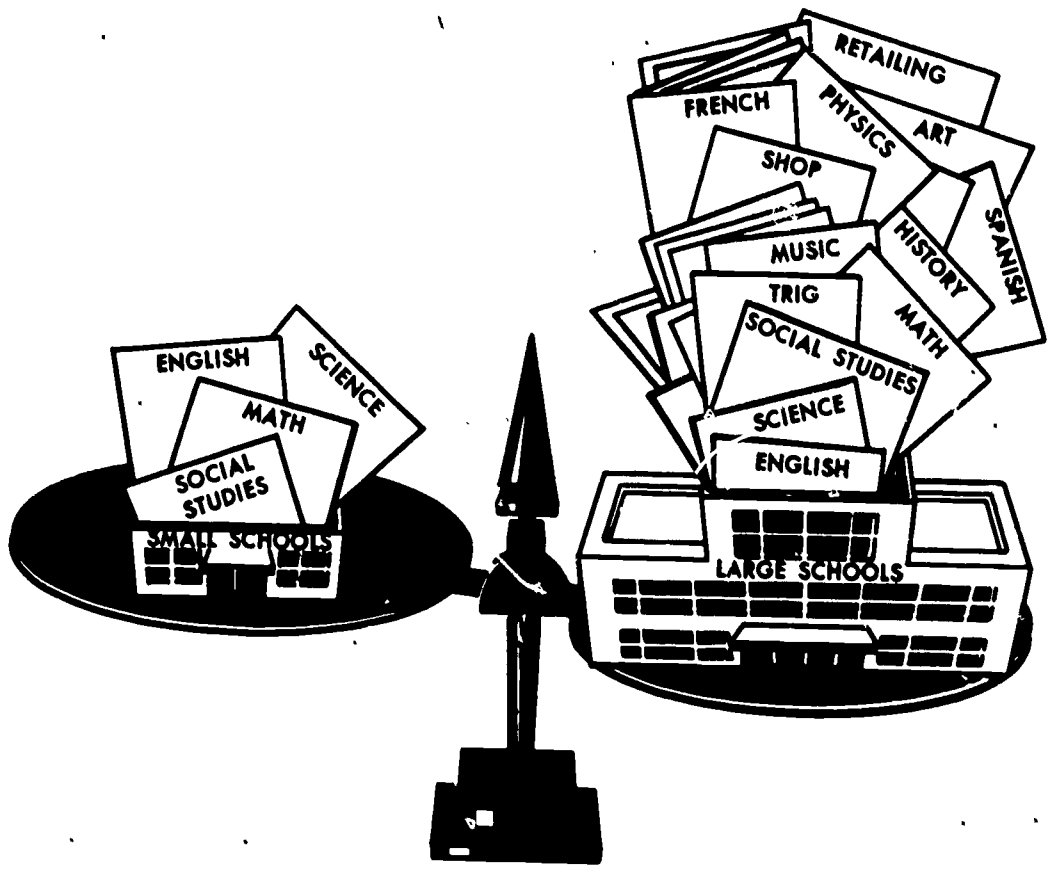
where $b = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$

and $a = \bar{Y} - b\bar{X}$

In this equation, $\tilde{Y}$ represents the predicted or estimated value of the dependent variable, and X represents the value of the independent variable. The values of a and b are constants, as derived from the above equations.

Subsequent to the initial procedures described above, the schools were compared on the basis of the selected variables in terms of total enrollment and organizational pattern type. By separating the schools into categories of size and grade pattern, it was possible (1) to compare schools of similar enrollment and organization patterns in terms of each program factor studied, and (2)

to evaluate the relative effectiveness of schools of various sizes and grade structures. The results of these analyses are described in the following chapter.



CHAPTER 3

How Do Large and Small Schools Compare?

As stated earlier, this study was conducted for the purpose of discovering whether the size of high schools in the South was significantly related to program quality as measured by selected criteria. Implicit in such an undertaking was the expectation that comparisons among

schools of different sizes and grade patterns would reveal differences in program adequacy. The fact that such differences actually exist may be verified by observation of school programs in operation. It was not surprising, therefore, that this study yielded evidence of striking dissimilarity among schools on the basis of certain factors.

In this section the distribution of schools by size and grade structure is presented, and the major findings of the study are described and summarized in the areas of (1) curricular program, (2) teacher qualifications, and (3) teacher load.

SCHOOL SIZE AND ORGANIZATIONAL PATTERN

The study included a total of 4,773 high schools, a breakdown of which is presented in Table 3 by enrollment size and organizational pattern. Nearly one-half of the schools were organized according to the 7-12 grade pattern, whereas only 6.4 per cent were three-year schools. The four-year schools comprised the second most prevalent organizational pattern, constituting nearly 30 per cent of the total number of schools. The distribution of schools by grade pattern was influenced considerably by statewide patterns of organization.

As shown in Table 3, the schools varied greatly in size, ranging from a total enrollment of 13 pupils in the smallest school to 4,169 pupils in the largest. Approximately two-thirds of the schools enrolled fewer than 500 pupils and only 1 out of 10 enrolled 1,000 or more pupils. Nearly 40 per cent were smaller than Dawson's recommended minimum of 300 pupils.

Generally speaking, school size increased as the span of grades included in the organizational structure decreased—i.e., as schools approached the three-year grade pattern. For example, over 25 per cent of the

TABLE 3

NUMBER AND PER CENT OF SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Grades 10-12		Grades 9-12		Grades 8-12		Grades 7-12		Total No. of Schools
	No.	%	No.	%	No.	%	No.	%	
1-99	1	0.4	70	25.6	26	9.5	176	64.5	273
100-249	7	0.5	346	25.0	186	13.4	846	61.1	1,385
250-499	45	2.9	456	29.8	224	14.7	804	52.6	1,529
500-999	99	9.2	370	34.3	205	19.0	405	37.5	1,079
1,000-1,499	72	23.7	92	30.3	66	21.7	74	24.3	304
1,500-1,999	48	38.4	31	24.8	24	19.2	22	17.6	125
2,000 or more	34	43.6	15	19.2	9	11.5	20	25.7	78
Total	306	6.4	1,380	28.9	740	15.5	2,347	49.2	4,773

10-12 schools enrolled 1,500 or more pupils, as compared with only 5 per cent of the 8-12 schools and less than 2 per cent of the 7-12 schools. On the other hand, less than 3 per cent of the 10-12 schools enrolled fewer than 250 pupils, whereas 44 per cent of the 7-12 schools were in this category. This relationship between size and grade pattern appeared to be fairly consistent, and undoubtedly was a function of both school district population and population density.

PROGRAM OF CURRICULAR OFFERINGS

One of the most significant criteria which affect the adequacy of school instructional programs is the breadth of the curricular program. This factor is measurable in terms of the number and variety of courses and subject areas available to students, and may be related to the school grade structure. Various elements of the program of course offerings were studied separately to determine the interrelationships among school size, grade pattern, and curricular programs. In order to assure valid comparisons, only courses offered above the eighth grade level were included.

Subject Areas

In this study "subject area" is defined as a broad curricular area embracing two or more related individual courses. For clarification purposes course offerings were categorized according to the following subject areas: English, mathematics, science, social studies, foreign language, agriculture, art, business education, home economics, industrial arts, music, physical education and health, and vocational. The "vocational" category does not include agriculture, business education, and home economics, which were given separate listings because of their relative prevalence. "Vocational" courses consist-

ed primarily of trade and industrial training, diversified occupations, and distributive education. A distinction was made between academic and nonacademic courses, with courses in the traditional areas of English, mathematics, science, social studies, and foreign language being designated "academic" and all others designated "nonacademic."

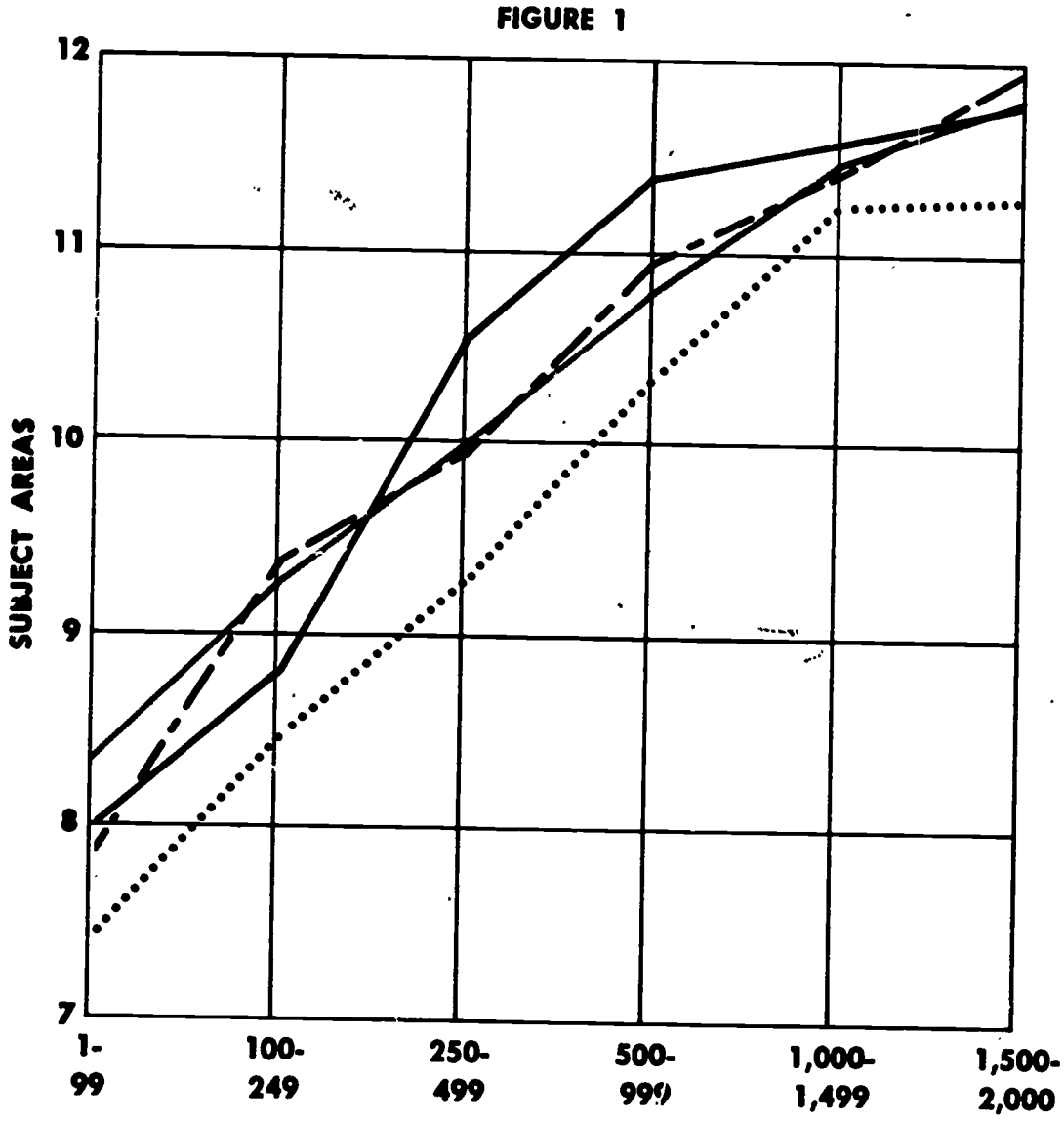
The median number of subject areas offered by all schools in each size category and grade pattern is shown in Figure 1. This graphic illustration emphasizes the marked relationship between school size and the number of subject areas offered. A steady increase in number of subject areas offered by schools of all organizational patterns was observed, up to an enrollment of 1,500 pupils. Except for the continued increase in the six-year schools, a plateau was reached at enrollment category 1,500-1,999. Beyond this size category, there appeared to be a slight decline in the number of subject areas offered by five-year schools and no appreciable change on the part of all other schools. At virtually all enrollment levels there was a slight but fairly consistent increase in the number of subject areas offered as grade patterns approached the three-year structure.

Total Course Offerings

In this study no attempt was made to reconcile differences in Carnegie credit assigned to various courses by different schools. Rather, all courses were assigned a value of *one*, regardless of Carnegie credit. For example, if a school offered four courses in mathematics, the number *four* was recorded, even though the Carnegie credit value may have been different for each course. By this means, consistent treatment of this factor was assured.

The strong positive relationship between school size and total courses offered is clearly illustrated in Figure 2.

FIGURE 1



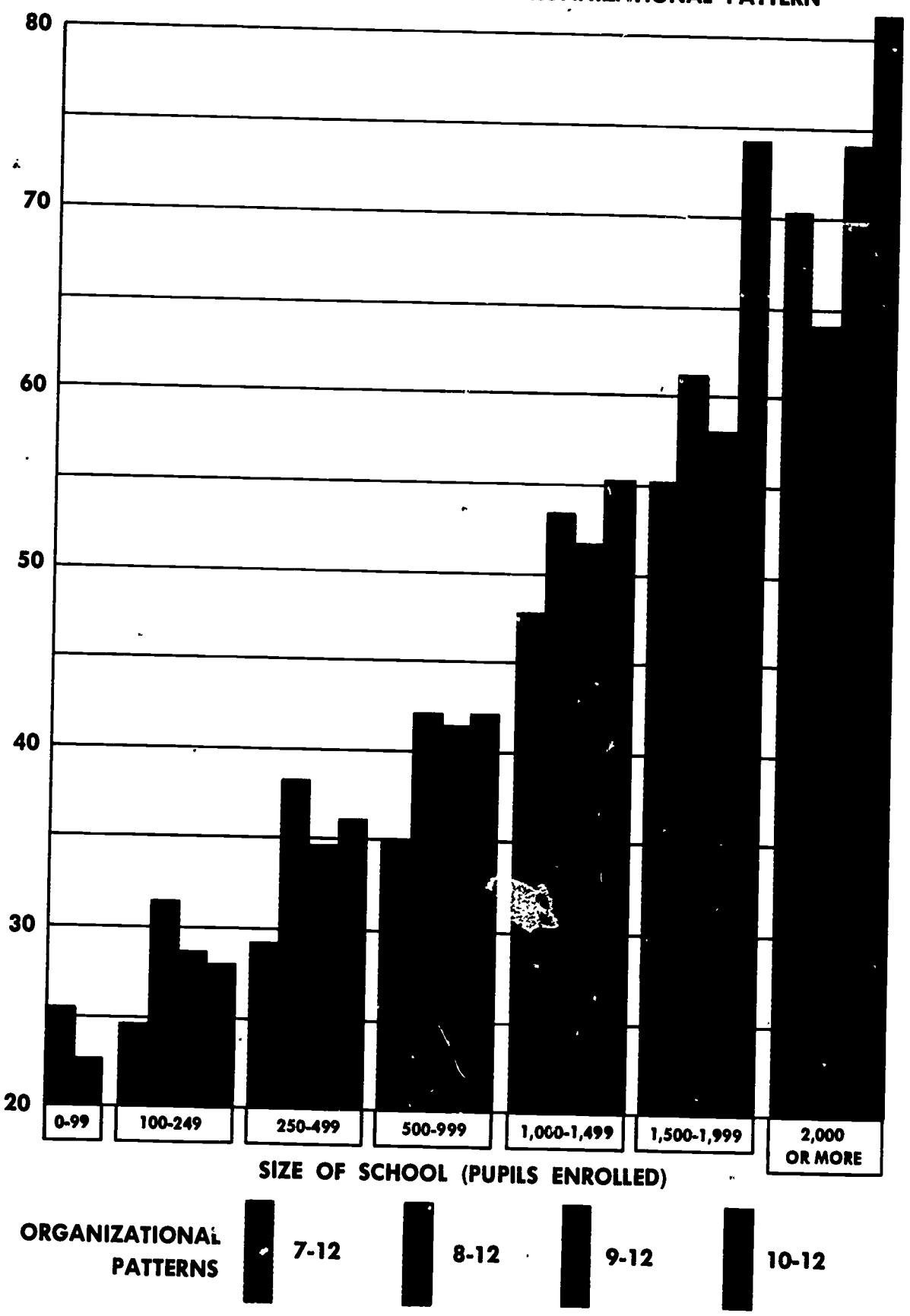
Median Number of Subject Areas Offered in Grades Nine through Twelve in Secondary Schools in Eleven Southern States, by Enrollment and by Organizational Pattern, 1962-63

7-12 8-12 9-12 10-12

As enrollments increased, the median number of courses offered by schools of each grade structure increased steadily through the largest enrollment category. Except in the smaller schools, the three-year schools offered more

FIGURE 2

MEDIAN NUMBER OF COURSE UNITS OFFERED IN HIGH SCHOOLS GROUPED BY SIZE AND GRADE ORGANIZATIONAL PATTERN



courses than schools of other organizational patterns and comparable sizes. On the basis of total courses the curricular programs provided in the 7-12 schools were relatively limited.

Pronounced increases in the number of courses offered occurred when enrollments reached 1,000 or more pupils. This suggests the possibility that larger schools with larger staffs are able through multiple sections to deploy their teachers more effectively in an expanded curricular program—without the risk of overburdening teachers with additional preparations.

Significantly, schools below 1,000 in enrollment (nearly 90 per cent of all schools studied) failed to provide at least 50 courses, which is near the minimum number recommended for an adequate program in a subsequent section of this report. While it is impossible to assume causal relationships, it is just as impossible to disregard the overwhelming evidence in support of larger schools on the basis of total course offerings.

Course Offerings by Subject Area

Thus far consideration has been given to two aspects of program scope or breadth: (1) the number of subject areas in which instruction is provided, and (2) the total number of courses available. Insight into program depth —enabling a more qualitative assessment of curricular program adequacy—is made possible by examination of the number of courses offered by subject area. These data are presented in Tables 4 and 5.

Course offerings in both academic and nonacademic areas show consistent increases as enrollment increases, regardless of grade organizational pattern. This marked relationship between size and program offerings is further confirmed by the following summary of correlation coefficients:

	Grades				
	7-12	*8-12*	*9-12*	*10-12*	*Total*
Academic courses	.7283	.7209	.7448	.7542	.7713
Nonacademic courses	.6658	.6045	.7221	.7050	.7292
Total	.7713	.7206	.7974	.7948	.8056

Tables 4 and 5 reveal a clear picture of enriched curricular opportunities in larger schools. Although even the smallest schools provided the basic academic offerings, the program was quite limited in many of these schools. A few courses in English, mathematics, science, and social studies were available in all schools, regardless of size, since graduation requirements in most states specify certain amounts of credit in these areas. However, substantial program expansion did not occur until enrollment exceeded a minimum level. For example, courses in art, music, industrial arts, and certain vocational areas were seldom offered in schools with enrollments below 500. The offerings in these areas did not increase significantly until enrollments of 1,000 or more were reached. Additional courses in academic areas, particularly foreign languages, were noted as enrollments exceeded 1,000.

These findings verify the relative superiority of large schools in terms of curricular program depth. The data show that three-year schools offered a larger number of both academic and nonacademic courses than did schools of other organizational patterns. As the organizational pattern of schools expanded to include additional grades, the number of courses offered at comparable enrollment levels tended to decrease. The fact that enrollments per grade level decreased as additional grades were added may have been an influencing factor in the number of courses offered.

TABLE

MODAL PATTERN AND RANGE OF COURSES OFFERED IN
ELEVEN SOUTHERN STATES, BY ENROLLMENT

Enrollment	Number of Schools	Courses: English		Mathematics	
		Mode	Range	Mode	Range
Grades 7-12					
99 or fewer	176	4	1-8	2	0-9
100-249	846	4	1-8	3	0-9
250-499	804	4	1-8	4	0-10
500-999	405	5	2-12	5	0-10
1,000-1,499	74	6	4-15	6	3-12
1,500-1,999	22	7	3-15	6	4-11
2,000 or more	20	8	5-16+	8	5-15
Grades 8-12					
99 or fewer	26	4	2-6	3	1-7
100-249	186	5	1-8	5	2-8
250-499	224	5	4-7	6	0-8
500-999	205	5	2-8	6	1-9
1,000-1,499	66	6	4-8	6	4-9
1,500-1,999	24	7	4-11	8	4-11
2,000 or more	9	7	2-16+	8	6-15
Grades 9-12					
99 or fewer	70	4	2-6	3	1-6
100-249	346	4	2-9	4	1-10
250-499	456	4	2-9	4	2-12
500-999	370	5	3-16+	6	2-12
1,000-1,499	92	6	2-15	7	1-12
1,500-1,999	31	7	4-12	7	3-9
2,000 or more	15	8	4-16	7	5-10
Grades 10-12					
99 or fewer	1	3		1	
100-249	7	4	3-5	4	3-6
250-499	45	5	2-12	5	2-7
500-999	99	5	2-14	5	0-12
1,000-1,499	72	7	2-16+	6	2-12
1,500-1,999	48	9	3-16+	8	4-13
2,000 or more	34	16+	5-16+	12	5-16

4

ACADEMIC SUBJECT AREAS IN SECONDARY SCHOOLS IN AND BY ORGANIZATIONAL PATTERN, 1962-63

Offered

Science		Social Studies		Foreign Language	
de	Range	Mode	Range	Mode	Range
	0-8	4	1-8	0	0-3
	0-6	4	0-8	0	0-4
	0-7	4	0-9	1	0-7
	0-8	4	0-12	2	0-8
	3-11	5	3-9	4	0-14
	3-10	6	3-8	6	2-11
	4-11	6	4-11	8	0-16+
	1-5	4	2-8	2	0-6
	0-6	4	2-8	2	0-6
	0-7	5	2-8	2	0-8
	0-6	5	2-10	3	0-12
	2-7	5	2-9	5	1-16+
	3-8	6	4-8	8	2-16+
	5-8	5.5	4-7	9	4-16+
	0-4	4	1-7	0	0-2
	1-8	4	0-9	1.5	0-7
	0-7	5	0-12	2	0-8
	0-8	5	2-9	4	0-10
	0-10	6	0-11	6	0-13
	1-7	5.5	4-8	7	2-13
	3-11	5.5	4-10	10	3-16+
		2		0	
	1-5	3	2-7	2	0-2
	0-6	4	2-9	3	0-6
	0-9	4	2-9	4	0-10
	0-11	5	1-10	8	0-15
	1-12	6	3-11	8.5	4-14
	3-14	6.5	3-14	12	6-16+

TABLE

MODAL PATTERN AND RANGE OF COURSES OFFERED IN NON-
ELEVEN SOUTHERN STATES, BY ENROLLMENT

Enrollment	Number of Schools	Courses: Agriculture Mode	Agriculture Range	Art Mode	Art Range	Bus. Ed. Mode	Bus. Ed. Range
Grades 7-12							
99 or fewer	176	0	0-6	0	0-2	3	0-8
100-249	846	2.5	0-6	0	0-2	3	0-8
250-499	804	3	0-5	0	0-4	4	0-8
500-999	405	2.5	0-6	0	0-4	4	0-11
1,000-1,499	74	0	0-5	1	0-4	5	1-10
1,500-1,999	22	0	0-4	1.5	0-4	7	1-9
2,000 or more	20	0	0-3	3	0-4	7	4-12
Grades 8-12							
99 or fewer	26	0	0-8	0	0-1	3	0-7
100-249	186	3	0-8	0	0-3	4	0-8
250-499	224	3.5	0-8	0	0-4	5	0-10
500-999	205	3	0-8	0	0-5	5	1-12
1,000-1,499	66	0	0-7	2	0-4	6.5	0-14
1,500-1,999	24	0	0-7	2	0-5	7	2-11
2,000 or more	9	0	0-2	4	1-5	9	6-11
Grades 9-12							
99 or fewer	70	1	0-4	0	0	3	0-6
100-249	346	4	0-5	0	0-2	4	0-8
250-499	456	4	0-5	0	0-2	5	0-11
500-999	370	4	0-6	0	0-6	5	0-11
1,000-1,499	92	0	0-4	1.5	0-8	6	0-13
1,500-1,999	31	0	0-6	2	0-5	7	0-16
2,000 or more	15	0	0-4	3	0-4	10	4-10
Grades 10-12							
99 or fewer	1	0		0		1	
100-249	7	1.5	0-4	0	0	4	0-6
250-499	45	1	0-4	0	0-3	5.5	0-10
500-999	99	0	0-4	0	0-4	6	0-13
1,000-1,499	72	0	0-4	2	0-5	8	0-12
1,500-1,999	48	0	0-6	3	0-6	11	0-14

5

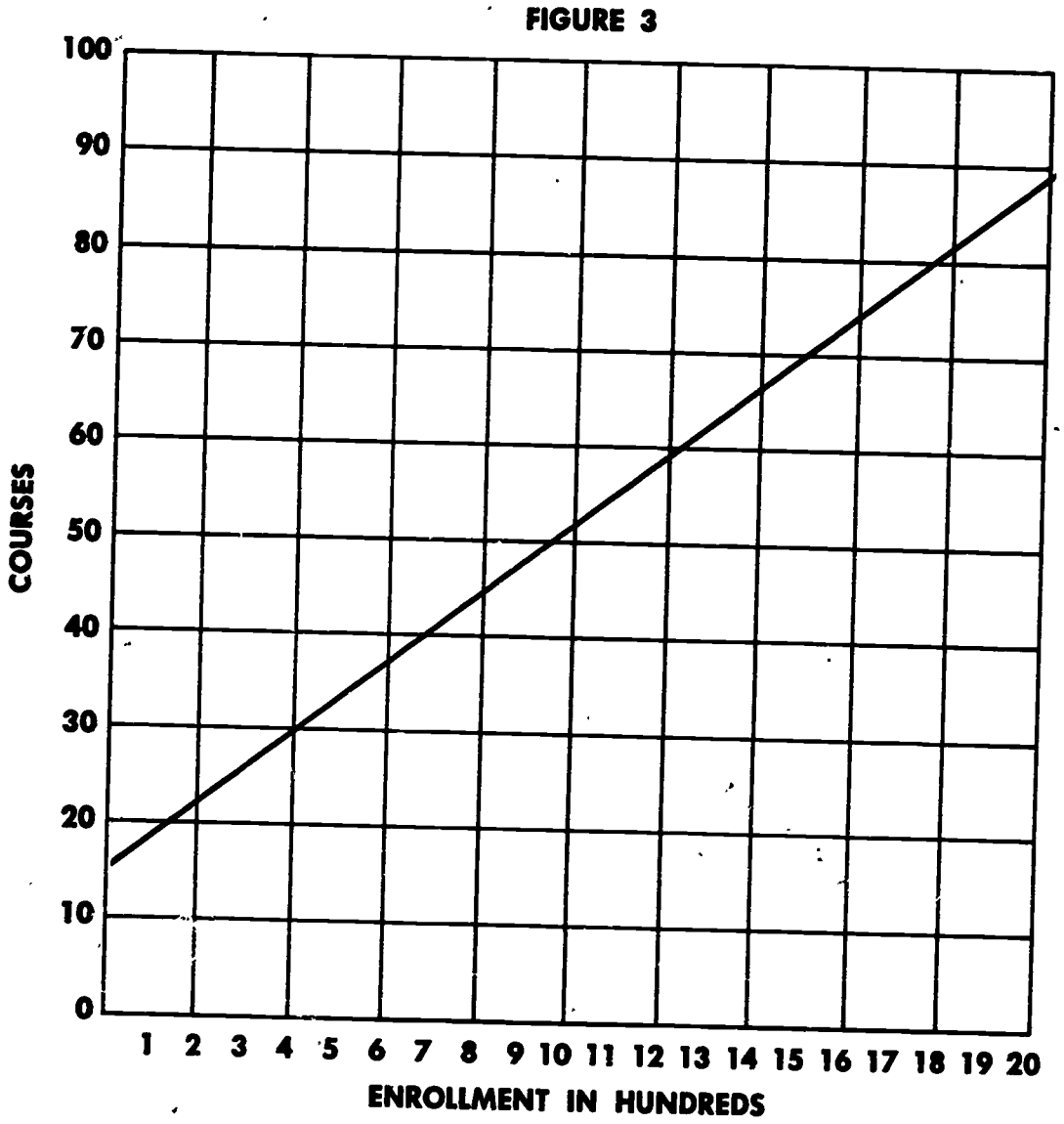
ACADEMIC SUBJECT AREAS IN SECONDARY SCHOOLS IN AND BY ORGANIZATIONAL PATTERN, 1962-63

Offered									
Home Ec.		Ind. Arts		Music		Phys. Ed.		Vocational	
Mode	Range	Mode	Range	Mode	Range	Mode	Range	Mode	Range
2	0-6	0	0-6	0	0-4	1	0-7	0	0-1
3	0-6	0	0-5	0	0-8	1	0-8	0	0-9
3	0-5	0	0-6	1	0-8	1	0-8	0	0-12
3	0-6	0	0-6	1	0-8	2	0-10	0	0-8
3	1-5	3	0-6	2	0-10	2	0-10	2	0-10
3	2-6	4	0-8	4	0-8	2	0-11	1	0-16+
4	1-5	6	1-7	4	2-13	2	2-11	2	0-16+
0	0-5	0	0-5	0	0-4	0	0-4	0	0-1
3	0-5	0	0-6	0	0-5	1	0-6	0	0-12
4	0-6	0	0-8	1	0-10	2	0-6	0	0-16+
4	0-6	2	0-9	2	0-8	3	0-9	2	0-16+
3	2-5	4	0-9	2	0-8	3	0-5	2	0-12
4	2-6	3	1-8	5	1-10	3	1-9	3	0-13
4	3-6	3	2-12	5	1-10	2	0-8	2	0-8
2	0-5	0	0-3	0	0-2	1	0-3	0	0-1
3	0-6	0	0-7	0	0-4	1	0-5	0	0-6
3	0-6	0	0-5	2	0-6	1	0-9	0	0-16+
3	0-6	1	0-12	2	0-12	2	0-9	1	0-16+
3	0-5	3	0-16+	3	1-8	2	0-9	3	0-16+
3	1-6	3	0-10	3	1-9	2.5	1-9	4	0-16+
4	2-6	4	3-10	4	0-10	2	0-9	5	0-16+
2		2		2		0		0	
3	0-3	0	0-11	0	0-2	1	0-2	0	0
2	0-5	1	0-5	1	0-7	1	0-7	2	0-16+
3	0-6	2.5	0-8	2	0-9	2	0-7	2	0-16+
3	1-7	3	0-8	4	0-10	2	0-8	3	0-16+
4	1-6	4.5	0-16+	5	0-12	2.5	0-9	3.5	0-16+

Lines of Regression

By use of the linear regression equation presented in Chapter II, a line of "best fit" was plotted as an additional means of identifying the relationship between school size and curricular program scope. (See Figure 3.) This

FIGURE 3



Ratio of Courses to School Size

line makes it possible to *predict* or *anticipate* the number of courses offered by schools of any size, on the basis of curricular programs which existed in southern high

schools during 1962-63. In effect, it constitutes a guideline by which curricular programs may be compared with current practice, and is particularly useful in the process of planning and projecting high school curriculum development. Also, the line of regression was especially vital to the process of determining optimum enrollment ranges described below.

Optimum School Size

For at least three decades investigations have dealt with the question of desirable school size. Recent research opinion tends mainly toward larger recommended enrollments than those proposed by Dawson and other early authorities. Because of the need for an objectively derived basis for determining desirable high school size in the South, and since objective data were available, an attempt was made in this study to determine an optimal enrollment range for high schools of each organizational pattern in terms of curricular program adequacy. An effort also was made to develop a practical "rule-of-thumb" technique for estimating the number of courses that should be offered to assure an adequate, well-rounded, enriched program of learning experiences for southern high school youth.

Tables 4 and 5, pages 26-29, show that a major portion of curricular program enrichment (in the form of additional courses and subject areas) occurred within the enrollment range of 500-1,500 pupils. These limits, therefore, embrace the optimal enrollment range on the basis of program adequacy. In reducing the range to practical proportions, reference was made to the line of regression shown in Figure 3, and to the range of units required for high school graduation in the eleven states studied. Computations involving these factors were made, resulting in the following recommended enrollment ranges:

Grades 7-12	*Grades 8-12*	*Grades 9-12*	*Grades 10-12*
950-1,300	810-1,150	890-1,250	700-950

This process yielded a value of 3.2 as the ratio between the mean number of course units required for graduation and the number of courses predicted for an adequate curricular program in Grades 9-12. For the three-year schools (Grades 10-12) the ratio was 2.4. This means that a minimum of 3.2 (2.4 for 10-12 schools) times the number of course units required for graduation should be provided in Grades 9-12 to assure a properly enriched program of curricular offerings.

It should not be assumed that the upper limits of these ranges represent the level above which program adequacy tends to decline, since the data proved that curricular programs generally continued to broaden in scope as school size increased—at least to enrollments of 2,000 pupils. Rather, these ranges indicate the general levels *below* which the provision of an adequate program is not possible without deliberate commitment of increased financial expenditures. For example, in small schools the problem of single-section classes is encountered. This means that when these schools expand their program of course offerings, they do so at the risk of magnifying an already serious inadequacy in the form of excessively small classes. The employment of additional teaching personnel and the consequent reduction of pupil-teacher ratio renders program expansion financially unfeasible in small high schools.

PROFESSIONAL QUALIFICATIONS OF TEACHERS

A basic assumption in this study was that instructional program quality is influenced to a considerable degree by the professional qualifications of instructional

personnel. It would be expected, therefore, that instructional programs of higher caliber should be available in schools which are staffed by teachers having higher professional qualifications in terms of training, certification, and experience.

Professional Training

The number and percentage of teachers in various categories of training are shown in Table 6. Approximately one-fourth of all teachers studied held master's degrees or beyond. Only 2.2 per cent had not completed college. There was less variation in the percentage of teachers holding bachelor's degrees than in other categories, probably because most states have established the bachelor's degree as the minimum level at which a "standard" teaching certificate may be obtained. Since the overwhelming majority (nearly 98 per cent) of teachers held at least the bachelor's degree, it is obvious that this minimum requirement for certification is being met to a highly creditable extent. This very fact, however, suggests the possibility that possession of a bachelor's degree may have lost its usefulness as a criterion of quality. The master's degree affords a more realistic means of discrimination.

Two general trends are apparent from the data in Table 6: (1) In schools of each organizational pattern, the proportion of teachers who did not hold at least the bachelor's degree decreased steadily as school size increased; and (2) the percentage of teachers with master's degrees or higher increased as size increased and as grade patterns approached the three-year structure, regardless of size. The three-year schools were decidedly superior to schools of other grade patterns, as evidenced by a higher percentage of teachers with advanced degrees and a

TABL

COLLEGE TRAINING OF TEACHERS IN SECOND
BY ENROLLMENT AND BY OR

Enrollment	Grades 7-12				Organizational Grades 8-12		
		Per cent				Per cen	
	Total number of teachers	Less than bache-lor's degree	Bache-lor's degree	Master's degree or above	Total number of teachers	Less than bache-lor's degree	Bache-lor's degree
99 or fewer	925	7.7	75.4	16.9	154	9.1	84.4
100-249	7,778	4.6	75.1	20.3	1,815	4.3	81.6
250-499	11,737	2.7	75.9	21.4	3,548	3.3	81.3
500-999	10,473	2.0	76.0	22.0	5,790	1.8	78.7
1,000-1,499	3,357	0.7	73.2	26.1	3,349	1.3	76.8
1,500-1,999	1,389	1.0	69.1	30.9	1,763	1.2	77.8
2,000 or more	1,792	0.3	70.7	29.0	836	0.7	75.8
Total	37,451	2.7	74.9	22.4	17,255	2.2	79.0

6

ARY SCHOOLS IN ELEVEN SOUTHERN STATES
GANIZATIONAL PATTERN, 1962-63

Pattern								
	Grades 9-12				Grades 10-12			
		Per cent				Per cent		
Master's degree or above	Total number of teachers	Less than bachelor's degree	Bachelor's degree	Master's degree or above	Total number of teachers	Less than bachelor's degree	Bachelor's degree	Master's degree or above
6.5	101	4.0	80.2	15.8				
14.1	1,065	2.2	75.3	22.5	89	9.0	65.2	25.8
15.4	3,791	2.5	74.8	22.7	786	0.6	65.0	34.4
19.5	7,473	1.9	69.4	28.7	2,504	1.4	62.1	36.5
21.9	3,828	0.7	68.7	30.6	2,948	0.	62.0	38.0
21.0	2,136	0.8	68.8	30.4	2,803	0.7	59.7	39.6
23.5	1,434	1.5	68.1	30.4	3,181	0.3	61.2	38.5
18.8	19,828	1.7	70.5	27.8	12,311	0.6	61.5	37.9

correspondingly lower percentage having less than four years of college.

Teaching Experience

The number of years of teaching experience was obtained from records in the various state departments of education for each teacher in the eleven states studied. The median as a measure of central tendency and interquartile range as a measure of dispersion were calculated for all teachers in schools of comparable size and grade structure. These data are displayed in Table 7.

As was expected, a wide range of teaching experience existed. The interquartile range generally was in the vicinity of 12 to 15 years, with the median varying from 7 to 12 years in most instances.

No identifiable relationship between enrollment size and teacher experience was revealed by the data, nor was it possible to validate the superiority of one particular grade pattern over another in terms of experience. On the basis of stability of median and interquartile range, however, the four-year schools had a more uniform balance of experienced and inexperienced teachers than schools of other patterns.

Teacher Certification

The concept of teacher certification is based on the assumption that teacher certification is related to teaching competence. It was assumed in this study, therefore, that schools having a lower percentage of pupils taught by noncertificated teachers were superior to other schools in terms of this criterion. No differentiation was made as to kinds of certificates.

An examination of Table 8 reveals two well-defined trends: (1) The percentage of pupils taught by noncer-

TABLE 7

TEACHER EXPERIENCE AT FIRST QUARTILE, MEDIAN, AND THIRD QUARTILE IN SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Years of Teaching Experience											
	Grades 7-12			Grades 8-12			Grades 9-12			Grades 10-12		
	Q_1	M	Q_3	Q_1	M	Q_3	Q_1	M	Q_3	Q_1	M	Q_3
99 or fewer	2.7	7.7	15.5	2.1	7.4	14.0	2.5	8.0	16.8			
100-249	2.8	8.7	17.5	3.0	8.6	16.0	3.2	8.6	17.0	2.4	7.0	13.8
250-499	3.3	8.7	18.0	3.0	8.6	16.0	3.1	8.7	18.0	4.1	9.2	20.7
500-999	3.1	8.3	17.5	2.9	8.3	16.5	3.4	8.9	18.5	3.7	9.1	19.8
1,000-1,499	2.7	8.0	15.0	2.5	7.7	16.0	3.3	8.9	19.3	6.5	12.5	21.6
1,500-1,999	3.2	8.3	16.5	1.7	6.5	13.5	3.2	8.6	19.0	4.1	10.5	21.0
2,000 or more	2.1	6.9	14.8	1.8	6.5	13.0	2.8	8.9	20.4	2.9	8.5	19.5

tificated teachers decreased as schools became larger; and (2) a similar decrease occurred as grade patterns approached the 10-12 structure. The median percentage in all schools below 500 in enrollment was approximately 14 per cent as compared with a median of approximately 5 per cent in schools enrolling more than 500 pupils. These findings further emphasize the probability that instructional program quality is relatively deficient in small schools.

TABLE 8

PER CENT OF PUPILS TAUGHT BY NONCERTIFICATED TEACHERS IN SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Organizational Pattern				Total
	Grades 7-12	Grades 8-12	Grades 9-12	Grades 10-12	
99 or fewer	19.5	20.7	11.2		18.3
100-249	15.1	10.1	7.5	11.6	13.9
250-499	10.5	11.3	8.6	6.9	10.0
500-999	8.1	8.5	7.6	5.5	7.7
1,000-1,499	8.0	5.1	7.1	3.8	6.2
1,500-1,999	8.4	3.9	6.0	1.0	4.2
2,000 or more	4.0	2.3	1.1	1.0	2.0
Total	10.0	8.3	7.2	3.0	7.9

TEACHER LOAD

All aspects of a teacher's work load are not quantifiable; therefore, it was necessary in this study to select certain objective criteria from which an adequate measure of teacher load might be obtained as a basis for comparisons among teachers. The following three factors

were selected as major elements in teacher load: (1) class size, (2) pupil-teacher ratio, and (3) number of pupils taught daily.

Class Size

In determining variation in class size, data were assembled for all classes in the 4,773 schools studied. Median class size in schools comparable in enrollment and organizational pattern was calculated as a measure of central tendency, and the first and third quartiles were calculated as a measure of variability. Results of these calculations are displayed in Table 9.

Generally speaking, class size in schools of all grade patterns increased up to enrollments of 1,000 pupils. No appreciable increases occurred beyond this point. Class size was more uniform in the three-year schools, as evidenced by the smaller variations in median and interquartile range.

Significantly, the most pronounced fluctuations in class size occurred in schools below 500 in enrollment, and, to a much lesser extent, in schools enrolling between 500 and 1,000. Class size variations were considerably less marked in schools of over 1,000 pupils. For example, median class size in all schools above 1,000 in enrollment was approximately 28, whereas in the smaller schools the median varied from 13 in schools with fewer than 100 pupils to 25 in schools with 250-499 pupils. This finding was not surprising because of the low enrollments in certain elective courses in small high schools.

Pupil-Teacher Ratio

As the term implies, pupil-teacher ratio is the numerical ratio between total school enrollment and total number of professional staff members assigned to a

TABLE 9

CLASS SIZE AT FIRST QUARTILE, MEDIAN, AND THIRD QUARTILE IN SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Organizational Pattern											
	Grades 7-12			Grades 8-12			Grades 9-12			Grades 10-12		
	Q_1	M	Q_3	Q_1	M	Q_3	Q_1	M	Q_3	Q_1	M	Q_3
99 or fewer	6	13	18	6	13	19	8	15	21			
100-249	13	20	27	13	21	28	15	21	29	15	22	28
250-499	18	25	32	18	25	32	19	25	31	18	24	29
500-999	20	26	32	21	27	32	21	27	32	21	27	31
1,000-1,499	24	28	32	22	28	32	23	28	32	23	28	32
1,500-1,999	24	29	33	22	27	32	24	28	33	23	28	32
2,000 or more	24	28	32	24	29	33	24	29	33	24	29	33

school. In effect, pupil-teacher ratio provides an indication of two factors: (1) the relative availability of professional staff members; and (2) per pupil costs, assuming an equality of cost factors other than staff salaries.

The pattern revealed in Table 10 closely parallels the findings derived from class size data in that pupil-teacher ratio increased as size increased up to enrollments of 500-999 pupils. Changes above enrollments of 1,000 pupils were negligible. Pupil-teacher ratio was quite low in small schools, particularly those below 250 in enrollment. Although low pupil-teacher ratios may be assumed to be advantageous within limits, Morris' study (1964) revealed that the advantages appear to be more than offset by the prohibitively high per-pupil costs in abnormally small classes.

TABLE 10

PUPIL-TEACHER RATIO IN SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Organizational Pattern				Total
	Grades 7-12	Grades 8-12	Grades 9-12	Grades 10-12	
99 or fewer	13.7	11.6	17.0		12.0
100-249	20.1	18.2	22.0	17.6	20.4
250-499	24.4	22.4	24.5	21.1	23.9
500-999	26.1	23.7	24.8	23.5	25.0
1,000-1,499	26.6	22.8	25.1	24.2	25.1
1,500-1,999	26.2	23.1	24.5	25.2	25.0
2,000 or more	26.0	23.8	24.8	26.4	25.6
Total	22.9	22.0	23.9	24.1	23.2

Number of Pupils Taught Daily

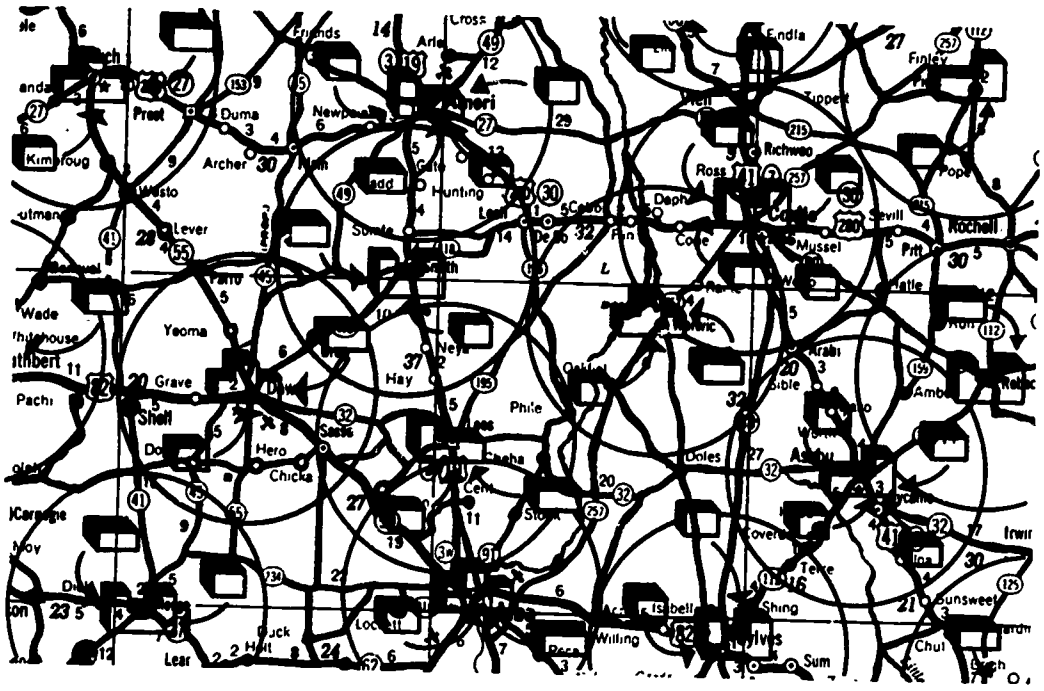
Daily pupil load was derived for each group of schools with comparable enrollment and organizational pattern by dividing the total enrollment in all classes by the total number of teachers. Results are shown in Table 11, by school size and type of grade pattern.

Daily pupil loads of teachers in small schools were relatively light as compared with those of teachers in large schools. For example, assuming a normal teaching assignment of five classes per day, teachers in the smallest schools taught classes which averaged 12-15 pupils in size, whereas teachers in the largest schools taught classes which averaged 24-27 pupils in size. Since an average class enrollment of 25 pupils has been generally accepted as optimum, it is evident that the smaller schools were far below the optimum level on the basis of this criterion.

TABLE 11

DAILY PUPIL LOAD IN SECONDARY SCHOOLS IN ELEVEN SOUTHERN STATES, BY ENROLLMENT AND BY ORGANIZATIONAL PATTERN, 1962-63

Enrollment	Organizational Pattern				Total
	Grades 7-12	Grades 8-12	Grades 9-12	Grades 10-12	
99 or fewer	75	69	61		72
100-249	97	91	72	72	91
250-499	114	110	91	105	107
500-999	129	113	101	101	114
1,000-1,499	136	111	114	113	119
1,500-1,999	141	113	125	115	122
2,000 or more	133	117	123	121	124
Total	118	110	101	112	111



CHAPTER 4

Ways In Which School Size Makes A Difference

This study has revealed marked interrelationships among school size, organizational pattern type, and selected measures of program adequacy in high schools of eleven southern states. Considered either separately or collectively, the data presented a strong case in favor of schools larger than the majority of those currently existing in the South. The relative inferiority of small schools, particularly those below 500 in enrollment, was evident in terms of practically every factor used as a basis for

comparison. Teaching experience was the sole criterion on which the evidence was not sufficient to establish the superiority of large schools.

In terms of the number of subject areas offered, the number of courses per subject area, and the total number of courses offered, curricular programs were broader and more enriched in schools above 500 in enrollment than in smaller schools. Since the program of course offerings is central to the provision of adequate learning experiences, this fact is significant. Furthermore, teachers in schools enrolling 500 or more pupils were better trained, in terms of college preparation and certification, than were teachers in smaller schools.

Most aspects of teacher load were more favorable in schools with enrollments greater than 500. Although the small classes and lower pupil-teacher ratios found in smaller schools are assumed by many to be advantageous, they result in inefficient staff utilization—thus becoming drawbacks from the standpoint of financial feasibility. Moreover, since teaching load in large schools did not exceed requirements specified by the Southern Association of Colleges and Schools (1964), it appears that overall teaching load was not excessive in large schools.

It was proved in this study that high schools should offer in Grades 9-12 a minimum of 3.2 times the number of course units required for graduation, in order to provide an adequate range of subjects for the learning needs of youth. For senior high schools the minimum was found to be 2.4 times the number of course units required for graduation. These facts suggest the following recommended enrollment ranges:

Grades 7-12	*Grades 8-12*	*Grades 9-12*	*Grades 10-12*
950-1,300	810-1,150	890-1,250	700-950

An enrollment of 500 pupils is established as a *defensible minimum* enrollment for southern high schools.

It is readily apparent that comparable *total* enrollment does not insure comparable educational opportunity within schools of different organizational patterns. Equal educational opportunities are more likely to exist within schools having similar enrollments *per grade level,* regardless of organizational pattern, than within schools of similar total enrollment. For example, this study revealed that six-year schools enrolling 500-999 pupils offered 7.5 fewer total courses than three-year schools of the same size range. On the basis of number of courses offered per grade level, the three-year schools had a similar edge. This suggests the possibility that—since it was found that larger total enrollments resulted in increased offerings—increased numbers of courses per grade level may be the result of larger enrollments per grade level. It would be misleading, therefore, to conclude superiority of one grade pattern over another without additional evidence, since factors other than those inherent in organizational structure may have contributed to the apparent superiority. However, definite relationships between type of grade pattern and certain aspects of program adequacy were observed, as noted in Chapter 3.

IMPLICATIONS FOR ACTION

This study is unique in three aspects: (1) No prior study of the relationship between high school size and program quality has been conducted for the entire southern region; (2) only objective, quantifiable data from official records were used; (3) the *total number* of eligible high schools, rather than a sample, was used as a basis for the study. Thus, possible inaccuracies due to subjective opinions and sampling error were avoided. Because of

this, and because of the breadth and comprehensiveness of the study, the findings have unusual significance for secondary education in the South.

Action at the State Level

While this study is relevant to secondary education at local, state, and regional levels, leadership at the *state* level probably represents the real key to the ultimate improvement of education. The practice of "local control" is entirely defensible when based upon proper understanding of what constitutes adequate educational opportunities, and upon demonstrated willingness on the part of local school leaders to exert the effort necessary to attain these levels of adequacy. However, unless safeguards are set up to insure that local systems adhere to satisfactory standards, the state can hardly justify taking tax money from economically more favored areas to support equalized educational opportunities elsewhere. The state, therefore, has not only the right but also the *responsibility* to use the attainment of satisfactory levels of efficiency and economy by local school systems as justification for delegating local control and providing state financial assistance.

School system reorganization is necessary if sound educational programs are to be realized in many areas of the South. In order to remove the instructional program deficiencies that appear to be inherent in many small high schools, as revealed in this study, school *systems* of sufficient size must be created before it is possible or feasible to establish *schools* of adequate size. There must be enough children to make possible the organization of schools which are adequate, economical, and conducive to efficient operation. In many instances this will necessitate crossing county lines and combining the school systems of two or more excessively small or sparsely settled

counties, since the majority of the individual counties in southern states are too small to provide a sound basis for statewide patterns of school system reorganization. It is not reasonable to expect local groups to take the initiative in this undertaking. State leadership is the key. State boards of education should be authorized to define uniform criteria of adequacy for school systems and to administer school system reorganization on a statewide basis.

The provision of school systems of sufficient size does not automatically assure individual high schools of proper size. Frequently, local opposition to the consolidation of small schools into larger ones is even stronger than resistance to school system consolidation. For this reason, states should specify standards of adequacy for high schools and withhold both state financial assistance and accreditation from school systems which are capable of meeting accreditation standards but which refuse to exert the effort necessary to do so. In a very real sense, the state contributes to the perpetuation of substandard conditions when it continues to support school systems which demonstrate little or no effort toward improvement.

Standards for high school approval should reflect a number of areas of emphasis. Despite the significance of curricular program scope and depth as criteria of educational adequacy, they are by no means the only elements in school quality. A school may offer a wide variety of courses in all subject areas and still be inadequate if staffed by poorly prepared, heavily loaded, inefficiently deployed teachers who may be additionally handicapped by insufficient instructional materials. Appraisal standards should take appropriate cognizance of all these factors. While school size is not in itself a cri-

terion of adequacy, it has been proved to be significantly related to numerous valid criteria.

The following outline is submitted as a proposed index for use in state and local evaluation of high schools. The factors selected are valid indicators of school adequacy, and are weighted so as to assure a reasonable and equitable balance among the various characteristics of quality. The index does not include factors such as lunch programs, transportation, physical facilities, etc.—not because they are unimportant, but because they bear less directly upon program quality. It should be noted that school size is not specified as a criterion, for the obvious reason that adequate size alone does not denote quality. It is, however, the one element common to numerous criteria.

Proposed Index for Use in the Evaluation of High Schools

I. *Balance among required subject areas*

Subject Area	*Standard as Minimum Number of Course Units Required*	*Quality Points if Standard is Met*
English and Language Arts	6	60
Mathematics	5	50
Social Studies	6	60
Science	5	50
Foreign Language	6	60
Art	2	20
P.E., Health & Safety	4	40
Music	3	30
Business Education	6	60
Agriculture & Home Economics	4	40
Industrial Arts	2	20
T & I	2	20
D.E. & D.O.	2	20
Tech. Educ.	2	20
Total Possible Quality Points		550

II. *Number and Variety of course offerings*

Standard: At least 55 total course units offered

Quality points: Total number of course units offered

$$\frac{\text{x 4 x No. of Areas}}{14}$$

Maximum allowable points: 300

III. *College preparation of instructional personnel*

Standard: All instructional personnel with bachelor's degree or above and at least 40 per cent of instructional personnel with master's degree or above

Quality points: Percentage of instructional personnel with master's degree or above x 5

Maximum allowable points: 200

IV. *Certification and assignment of teachers*

Standard: All classes taught by teachers who are certificated in subject being taught

Quality points: Percentage of all classes taught by certificated teachers x 2

Maximum allowable points: 200

V. *Teacher load*

Standard: (a) Maximum of 5 teaching periods daily per teacher

(b) Maximum of 3 different preparations per teacher

(c) Maximum of 150 pupils taught daily by teachers of all subjects except music and physical education

Quality points: (a) Percentage of staff meeting standard x 1

(b) Percentage of staff meeting standard x .5

(c) Percentage of staff meeting standard x .5

Maximum allowable points: 200

VI. *Library resources*

Standard: Minimum of 10 library books per pupil in average daily attendance

Quality points: Average number of library books per pupil in average daily attendance x 20

Maximum allowable points: 200

VII. *Annual per-pupil expenditure for library materials*

Standard: Minimum expenditure of $2.50 per pupil in average daily attendance

Quality points: Annual per-pupil expenditure (in dollars) x 80

Maximum allowable points: 200

VIII. *Specialized staff positions*

Principal

Standard: One nonteaching principal holding a master's degree or higher

Quality points: 100 if standard is met

Librarian

Standard: Minimum of one librarian; one librarian for each 500 pupils or major fraction thereof, up to 1,000 pupils; one additional librarian for each additional 700 pupils or major fraction thereof

Quality points: 100 if standard is met

Counselor

Standard: Minimum of one counselor; one counselor for each 400 pupils or major fraction thereof; or the equivalent if formal guidance responsibilities are dispersed among faculty

Quality points: 100 if standard is met

Other specialized staff

Standard: One additional nonteaching staff member

Quality points: 100 if standard is met

Summary

Standard	*Maximum Allowable Quality Points*
I. Balance among required subject areas	550
II. Number and variety of course offerings	300
III. College preparation of instructional personnel	200
IV. Certification and assignment of teachers	200
V. Teacher load	200
VI. Library resources	200
VII. Annual per-pupil expenditure for library materials	200
VIII. Specialized staff positions	400
Total Possible Quality Points	2,250

The above index is not considered as having particular relevance to conditions in any specific state or locality. It has broad possibilities for modification according to the dictates of circumstances peculiar to each state. It does set standards at "desirable" rather than "minimum" levels. A variety of approaches may be used in its implementation. If used in its present form, it is suggested that a minimum of 1,650 points (approximately 75 per cent of the possible total) be required for state approval.

Action at the Local Level

It has been definitely established that high schools must be made larger if comprehensive programs are to be provided, the goal being the more adequate program rather than merely a larger school. Two avenues are available: (1) consolidation through state-initiated ac-

tion, as described above; and (2) enlargement of school centers through the normal processes of desegregation. The latter course, while already in progress in many areas through voluntary effort and legislative-judicial mandates, is certain to be accelerated as a result of the Civil Rights Act of 1964 which grants financial assistance to school systems involved in desegregating school facilities and withholds federal aid from systems which practice discrimination. As consolidation occurs, enrollments will increase to the point of enabling expanded curricular programs without excessive financial expenditures, because of full classes in specialized courses and more efficient staff utilization. School leaders will be confronted with this crucial question: What criteria should guide the process of program building? In other words, what directions should program expansion take?

The answer to this question depends upon many factors, the most important of which concerns the envisioned purposes of secondary education. If the purpose of high schools is to prepare pupils for college, and do little more than this, there is no great need to change much of the existing setup, for most high schools already provide reasonably acceptable college-preparatory offerings. Even the small high schools, with their relatively limited curricular programs, have for the most part done a commendable job in this respect. Likewise, many schools provide fairly satisfactory general education programs, in terms of courses designed as basic preparation for living. But if a legitimate purpose of secondary education is to provide educational opportunities that are more directly geared to the needs of terminal students—with specific implications for vocational orientation—the typical small school comes up short. Small high schools simply are not able to offer *enough* subject areas and courses to meet the needs of all types of students within

the limits of current teacher allocations. In other words, the neglect and sacrifice of the interests of noncollege-bound youth is the price the small school pays in order to serve college entrance requirements.

Consider, for example, a typical southern four-year high school of 300 pupils, which has the following program of course offerings: four units in English; three each in mathematics and science; four in social studies; two in foreign languages; three or four in agriculture; two or three in business education; three in home economics; and two in physical education, for a total offering of about 28 units. Assuming properly qualified instructional personnel, this program provides a basically satisfactory curricular arrangement for college-bound youth. It offers little of practical value to terminal students, however, beyond basic general education. Course offerings in a school twice this size typically consist of the above courses plus an additional unit or two in each of the areas of mathematics, science, social studies, foreign languages, and business education, plus a course in industrial arts, music, and some vocational area—comprising a total of 36-40 units. Again, these additions essentially "beef up" existing academic programs, with a minimum of expansion in nonacademic areas. In small schools which are struggling to meet accreditation standards, the disposition of school leaders to curtail course offerings not related to college entrance penalizes noncollege-bound youth.

Another significant element in program planning is change in population patterns. Shifts in population from rural to urban centers suggest that rural youth need a more urban type of education than heretofore, necessitating the addition of subject areas not presently offered in rural high schools and the deletion of courses no longer as appropriate as formerly. The program of vocational

agriculture, for example, needs to be reassessed and retained only in those schools whose employment surveys reveal a need for agricultural workers plus a reasonable probability that a significant number of youth enrolled in vocational agriculture will be gainfully employed in related occupations. The pronounced changes in employment patterns in the South point up the necessity for different types of occupational training, with greater emphasis upon distributive education and diversified occupations; business education, technical and industrial training, and preparation for specific job opportunities unique to the local area.

A basic issue, therefore, is this: Should high school programs focus primarily upon the academic preparation of college-bound youth, as is the case in the majority of southern high schools; or should appropriate educational experiences be provided for terminal and/or educationally deprived youth, at the same time maintaining and strengthening the preparation program for those who will enter college? The answer is obvious—yet, present practices are not in keeping with this philosophy of comprehensiveness because small schools are unable to offer a comprehensive program. Only when schools are large enough to provide curricular programs of sufficient depth and diversity to fulfill the needs of *all* youth will the goal of equivalent and equitable educational opportunity be within reach. Adequate size alone is no guarantee of excellence, however; school program planners still must exercise good judgment in the selection of course offerings which are appropriate to overall development and geared to local conditions. The factual evidence is that this good judgment and the necessary commitment are frequently lacking in schools that could offer a greater variety of courses yet fail to do so.

While local circumstances should influence the final determination of curricular programs, an adequate high school program contains certain essential features which may be stated in terms of numbers and types of course offerings. The following outline of suggested courses for a four-year high school of 1,000 pupils is presented as a guide. Although no claim is made for completeness or finality, the outline should serve as a useful guideline for principals and curriculum planners in maintaining a proper balance among various aspects of the curricular program.

Subject Area	*Number of Course Units*
English and Language Arts	6
Mathematics	6
Science	6
Social Studies	6
Foreign Languages	8
Art	2
Business Education	8
Home Economics	3
Industrial Arts	2
Music	3
Vocational	8
Total	58

No attempt is made to identify specific courses within each subject area, nor to prescribe sequences and course combinations within areas such as foreign languages and business education. Vocational offerings should be selected on the basis of local needs as determined through the cooperative efforts of school leaders and employment agencies.

The time is ripe for change—*for improvement*. The current nationwide interest in improved education, plus the impact of recent federal legislation, combine to create a setting in which significant forward steps in secondary education may be taken. There is every reason to believe that positive steps taken toward genuine improvements will win strong public support. The people want *better* schools. It is up to personnel in leadership positions—at state, district, and local school levels—to exert the initiative necessary to promote educational improvements and to advance the cause of education in the South.

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