A COMPARISON OF SELECTED STUDENT AND ENVIRONMENTAL VARIABLES IN OPEN-AREA AND TRADITIONALLY-CONSTRUCTED ELEMENTARY SCHOOLS

DISSERTATION

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By

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The problem of this study was to assess and compare selected student and environmental variables in seven open-area elementary schools carefully matched with seven traditionally-constructed elementary schools on eight different criteria.

The hypotheses were formulated to carry out the following four purposes of the study:

1. To determine the differences between the achievement test scores in reading, language, and mathematics of students attending open-area elementary schools and scores of similar students attending traditionally-constructed elementary schools, as measured by the California Achievement Test and the Comprehensive Tests of Basic Skills administered in grades one, two, and three.

2. To determine if there was greater individualization of instruction in open-area elementary schools as measured by the Individualization of Instruction Inventory.

3. To determine if students attending open-area elementary schools evidenced a greater number of positive
actions toward school, as indicated by attendance, number of acts of vandalism, and number of suspensions from school shown in official records of the school district.

4. To determine if the organizational climate of the open-area elementary schools was significantly different as evidenced by Halpin and Croft's *Organizational Climate Description Questionnaire*.

The t-test for independent samples was used to test the hypotheses. Based on the analyses of the data used to test the hypotheses, the findings were as follows:

1. There were no significant differences in the mean achievement scores of the two groups of schools compared.

2. There was a significant difference in the degree of individualization of instruction in the two groups of schools compared.

3. There was no significant difference in the rate of student daily attendance for the two groups of schools compared.

4. The number of acts of vandalism was significantly lower in the open-area elementary schools.

5. The number of student suspensions from school was significantly lower in the open-area elementary schools.

6. There was no significant difference in the organizational climates of the two groups of schools compared.

Based upon the findings of the study and the review of the literature, the following conclusions were drawn:
1. One type of school facility does not appear to be superior to the other in producing significantly higher achievement scores.

2. Open-area schools appear to experience a greater degree of individualization of instruction.

3. Open-area schools appear to be more flexible and amenable to innovative techniques of instruction.

4. Open-area schools appear to sustain less vandalism.

5. Traditional schools with constraints of space and accentuation of noise and movement appear to experience a greater number of student suspensions.

6. The type of facility does not appear to influence organizational climate in schools.

7. The construction trend across the nation appears to favor the building of new facilities featuring the open-area concept.

The following recommendations are made:

1. Architectural form should be based on educational objectives.

2. Open-area teachers and administrators should be carefully selected and trained.

3. Additional research of open-area schools is recommended.

4. School districts should continue to construct open-area schools.
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CHAPTER I

INTRODUCTION

In recent years, the nation's educational leaders have faced the challenge of providing additional elementary school facilities for an increasing number of students. At the same time, these leaders faced the perennial task of preparing students to live in a constantly changing world. The question often asked was whether or not the schools were relevant to the needs of society. Across the country, educators sought better ways to teach the three R's. The individualization of instruction, with programs designed to discourage "locked-step" instruction, to foster non-gradedness, to encourage team teaching, and to engender new grouping and staffing patterns, became the top priority of many school districts. School planners, attempting to house additional students and to improve educational programs at the same time, began to effect drastic changes in school architecture. These efforts to provide a more flexible, less structured, cost-effective school plant gave impetus to the advent of open-area schools.

While it is generally felt that open-area schools have been well received by students, teachers, and parents and
have effected an organizational climate more conducive to
the individualization of instruction, there is a need to
gather specific facts and descriptive information to assess
and compare the progress of students in open-area elementary
schools to the progress of similar students in traditionally-
constructed elementary schools.

Statement of the Problem

The problem of this study was to assess and compare
selected student and environmental variables in open-area
and traditionally-constructed elementary schools.

Purposes of the Study

The purposes of this study were the following:

1. To determine the differences between the achievement
test scores in reading, language, and mathematics of students
attending open-area elementary schools and scores of similar
students attending traditionally-constructed elementary
schools as measured by the California Achievement Tests
(CAT) administered in grades one and two and the
Comprehensive Tests of Basic Skills (CTBS) administered
in grade three.

2. To determine if greater individualization of
instruction occurred in open-area elementary schools
than in traditionally-constructed elementary schools as
measured by the Individualization of Instruction Inventory
(III).
3. To determine if students attending open-area elementary schools evidenced a significantly greater number of positive actions toward school than did similar students attending traditionally-constructed elementary schools as indicated by attendance, acts of vandalism, and number of student suspensions recorded in official records of the Dallas Independent School District.

4. To determine if the organizational climate of the open-area elementary schools was significantly different from that of the traditionally-constructed elementary schools, as evidenced by Halpin and Croft's Organizational Climate Description Questionnaire (OCDQ).

Hypotheses

To carry out the purposes of this study, the following hypotheses were formulated:

1. There will be no significant differences in the mean achievement scores of students attending open-area elementary schools as compared to similar students attending traditionally-constructed elementary schools (a) at the end of one year of instruction in reading, language, and mathematics; (b) at the end of two years of instruction in reading, language, and mathematics; and (c) at the end of three years of instruction in reading, language, and mathematics.
2. There will be a significantly greater degree of individualization of instruction in the open-area elementary schools than in the traditionally-constructed elementary schools.

3. Students attending open-area elementary schools will evidence a significantly greater number of positive actions toward school than will similar students attending traditionally-constructed elementary schools as indicated by (a) a higher rate of daily attendance; (b) fewer acts of vandalism; and (c) fewer suspensions from school.

4. The organizational climate of open-area elementary schools will be more open than that existing in traditionally-constructed elementary schools, as reflected by significantly different mean scores on the Organizational Climate Description Questionnaire subtests of Esprit plus Thrust minus Disengagement.

Background and Significance of the Study

As the nation entered the decade of the 70's, educational leaders faced a myriad of challenges. The school population explosion had created a tremendous need for additional school facilities. Leaders also faced the impossible task of trying to prepare young people to live in a rapidly changing, highly technical world whose future no one could predict (19). The question often raised was whether the schools were relevant to the needs of modern
students. Gross and Murphy (12, p. 9) described a new spirit that enlivened American education, "a spirit of innovation, experimentation and venturesomeness." Many of the nation's educational leaders recognized and took advantage of the opportunity, afforded by these challenges, to effect substantial change in their schools. According to Goodlad (9, p. 28), the nation's schools in recent years "have been virtually inundated with efforts of almost every conceivable kind to inject into the schools some ingredient of change or innovation, innoculations presumed to be for the health of the elementary school."

School architecture was a primary focus of much of this change, and it was during this period that many of the nation's modern open-area schools were constructed. While the current need for additional facilities is generally not as acute as in the past, Graves (11) indicated that the nation, as it entered the decade of the 70's, had 250,000 classrooms considered inadequate by present-day standards. With pre-inflation costs, he estimated it would require about $5 billion to modernize the classrooms alone, without including the cost of general use facilities.

Enrollment in the Dallas Independent School District is stable at the present time, and Springer (31) does not project significant growth or a need for additional facilities in the immediate future. However, Springer
does indicate the necessity of replacing thirteen schools which have a beneficial life expectancy of less than ten years. This, in itself, will be a significant building program necessitating a large expenditure of funds.

As educational leaders grapple with the challenge of providing additional and replacement facilities, they must consider the inherent programmatic implications of each proposed educational facility and whether or not there is evidence that the facility can provide a positive and significant impact on the total educational program. In considering the need for programmatic improvements, Lessinger (22, p. 3) stated that "our schools somehow fail one youngster in four... while doing $30 billion of (bad) business annually." Glasser (10) reported that his experience in one large city system revealed that 75 percent of the children do not receive a satisfactory education. Illich (16) cited the expenditure of over $3 billion between 1965 and 1968 in behalf of six million children without detecting significant improvement in their learning. Weikart (33) related that only twenty-one out of a sample of 1000 compensatory programs tested in the period of 1963-68 met a criterion of improved intellectual or academic functioning. The Measurement Profiles compiled by the Department of Research and Evaluation of the Dallas Independent School District (24) reflect a
decrease in the level of reading achievement for Anglos and only maintenance of level for minority students.

Frazier (8) pointed out that everyone suffers when schooling becomes over-structured and unyielding and that too many American schools can be charged with being authoritarian in organization and operation. He urged educators at every level to work for greater freedom and less authoritarianism, with openness being the key concept in the whole movement. Morisseau (26) related an interview with Alvin Toffler, who feels that as schools pay attention to individual needs and individual schedules and teach different things to different people, an alternative kind of physical structure will be needed. Morisseau asserted that a great deal of learning can go on outside the classroom. The day of the massive factory style school is at an end, he added, although it is hard to determine what exactly will replace it. Warner (32) compared the performance of students and teachers in an open-area facility and in self-contained classrooms and concluded that one facility was not superior to the other, that teacher and pupil performance were equal and similar, and that the open-area facility can accommodate the same type of program as the self-contained classroom facility. One important advantage of the open-area facility was flexibility. Kennedy and Say (21), in a study of the comparison
of the effects of open-area versus closed-area schools on the cognitive gains of students, reached no definite conclusions indicating either approach to be superior to the other in producing cognitive gain over a one-year time span.

Other studies indicate that the school organizational pattern has a measurable effect on the behavior and actions of teachers and students. Brunetti and others (2) examined the consequences of affording teachers the opportunity to work in an open-area setting that emphasized staff interrelations. Findings indicated that teachers in teaching teams felt more influential, had more autonomy, and had higher job satisfaction. Chittenden (4) reported that one critical focus for the evaluation of open education is a focus on teachers. Meyer's (25) major findings revealed that open-space school teachers were more satisfied with their jobs, felt more autonomous, and reported more influence in decision-making. Johnson (18) reported that organizational climate does exist and is an enduring phenomenon resistant to change. He also pointed out that our current emphasis on individualizing instruction in elementary schools and on implementing programs requiring extensive personal interaction among teachers behooves educational administrators to investigate the existence of the phenomenon and its effects on the operation of the school. Hughes (15) and Johnson and Marcum (20) maintained
that it is desirable to alter organizational climates. The report (17) of a national seminar involving a large group of teachers, administrators, and architects emphasized that the open plan system, with its flexible physical arrangements and teaching program, holds great promise as a method of training people to think for themselves.

In conclusion, the intended major contribution of this research study is to provide educational leaders with a broader base for decision-making. Findings indicate the extent to which selected open-area facilities enhance achievement, facilitate the individualization of instruction, increase the positive actions of students toward school, and provide for a more favorable organizational climate considered essential to teacher morale and performance. Such information, considering the magnitude of challenges facing educators in the decade of the 70's, should prove beneficial to educational decision-makers.

Definition of Terms

For the purposes of this study, the following definitions were formulated:

1. An open-area school is an educational facility constructed with the fewest possible internal structural constraints on grouping and organizing children for learning.
2. A traditionally-constructed school is an educational facility constructed with multiple individual classrooms, each designed to house approximately thirty-five students and one teacher.

3. The organizational climate of a school is the summation of the computation of the eight dimensions of organizational climate as defined by Halpin and Croft and measured by the OCDQ. These computations are derived by assessing the teachers' attitudes toward, or perceptions of, the behavior of teachers and the principal in their school. According to Owens (27, p. 167), "sometimes this individuality is called the atmosphere of a school; other popular labels include the tone of the school, the school's personality."

4. Positive actions toward school is a favorable indication of student activities and attitudes related to school, as evidenced by rate of attendance, number of acts of vandalism, and number of suspensions.

Limitations

The study was limited to the seven open-area elementary schools in full operation in the Dallas Independent School District at the time of the study.

Instruments

This study made use of a broad range of instruments, most of which are used in the System-Wide Testing Program
of the Dallas Independent School District. This basic testing program recognizes the importance of personalizing and individualizing the educational program for each child. The System-Wide Testing Program includes instruments which assess school readiness, scholastic aptitude, academic achievement, and educational development, with tests administered in a systematic manner in order to provide comparable student scores. The testing program is structured around recommendations of a local testing committee, of the Planning, Research, and Evaluation staff, and of school district teaching personnel as well as relevant input from an investigation of the practices of twenty-five large city school districts.

Description of Instruments

California Achievement Test

Merwin, in a review prepared for the Buros Mental Measurements Yearbook (3), indicated that the California Achievement Test (see Appendix D) is suited for use by schools attempting to assess the achievement of fundamental skills and content in the areas of reading, arithmetic, and language. Kuder-Richardson reliabilities are reported as satisfactory, falling between 0.86 and 0.96 for total reading, arithmetic, and language tests. Coefficients of correlation between California Achievement Test subtests
and the most nearly comparable subtests of the Stanford Achievement Test and the Metropolitan Achievement Test are evidence of construct validity. These coefficients are uniformly high.

**Comprehensive Tests of Basic Skills**

A review by Ahman in the *Buros Seventh Mental Measurements Yearbook* (3, p. 8) cited the Comprehensive Tests of Basic Skills "as a well developed test which is packaged in a professional manner." The test is reported to possess validity and reliability characteristics consistent with the 1966 recommendations of the American Psychological Association. The review indicated that the degree of content validity is strengthened by utilizing teachers to write the original test items with the assistance of curriculum and testing specialists. These joint efforts reportedly provide a solid base for a quality test. Reliability determinations indicated that a high degree of reliability exists for subtest scores as well as for total scores with coefficients in the 0.85 to 0.95 region, although a few ranged as low as 0.75.

**Organizational Climate Description Questionnaire (OCDQ)**

The Organizational Climate Description Questionnaire was developed by Halpin and Croft under the funding of the United States Office of Education Cooperative Research
Project No. OEC-SAE-543-8639. Teachers respond to sixty-four Likert-type questions which yield eight subtest scores, four of which pertain to the faculty as a group and four to the principal as a leader.

Each of the eight subtests yields a score that can be used to determine the degree of openness existing within a school. The degree of openness will be compared for each of the treatment groups (open-area versus traditionally-constructed schools) to determine if organizational climate varies. Communalities were established (proportion of variance accounted for) for each of eight subtests. The communalities are conservative estimates of reliability of the subtest. Halpin (13) reported the following subtest reliabilities: aloofness--0.72; production emphasis--0.53; thrust--0.64; consideration--0.64; disengagement--0.66; hindrance--0.44; esprit--0.73; and intimacy--0.53. Subtests of aloofness, production emphasis, thrust, and consideration all pertain to the behavior of the principal as perceived by the teacher. Aloofness pertains to such concepts as the extent to which the principal is formal and impersonal and the extent to which he adheres to written policies. Production emphasis refers to the principal's type of supervision, his playing of the role of boss, and his degree of sensitivity to feedback. Thrust relates to such concepts as whether or
not the principal moves the organization by example, whether or not he asks for more from the teachers than he gives himself, and whether or not he is task oriented but viewed favorably by teachers. Consideration has to do with the principal's inclination to treat teachers humanly and to do a "little extra" for them in human terms.

Subtests of disengagement, hindrance, esprit, and intimacy all pertain to teacher behavior. Disengagement measures the teacher's behavior in a task-oriented situation and the teacher's tendency to be "not with it" or "to go through the motions." Hindrance relates to the teacher's feeling that the principal is stressing excessive busy work. Esprit has to do with the morale of the faculty and the sense of accomplishment that exists. Intimacy is the faculty's perception of the existence of friendly social relations with each other and is not necessarily related to task accomplishment.

Brown (1), in a replication study, established reliability coefficients that compared favorably with those of Halpin and Croft. The instrument's validity has not been established fully due to the fact that the concept of "organizational climate" first must be quantified independent of the Organizational Climate Description Questionnaire, and then measurements of the
relationship of Organizational Climate Description Questionnaire scores to independent measurement must be made. Since the concept under analysis—organizational climate—is elusive, no definitive work on validity has been done. However, the instrument is in common use and appears to describe organizational climate well enough for public school research (see Appendix B for a copy of the Organizational Climate Description Questionnaire).

Individualization of Instruction Inventory

Developed by Betty Coody and Ben M. Harris, the Individualization of Instruction Inventory (III) was selected by the System-Wide Evaluation Component of the Dallas Independent School District's Department of Research and Evaluation for use in a system-wide assessment of the District's efforts to individualize its educational program. The particular form used consisted of twenty-five Likert-type items which allowed the teacher to rate herself on different classroom practices including use of special subgroups within the classroom, use of a variety of instructional materials, use of differentiated assignments for individuals within the classroom, use of procedures for giving students more freedom and responsibility for learning, and use of tutorial techniques of various kinds within the classroom.
The internal consistency of the III as estimated by coefficient alpha for a sample of 131 Dallas Independent School District teachers was 0.85. A panel of Dallas Independent School District instructional personnel reviewed this instrument and concluded that it had a sufficient degree of content validity to merit its use on a system-wide basis. Concurrent validity is currently being checked (see Appendix C for a copy of the Individualization of Instruction Inventory).

Procedures for Collecting Data

Matching the Schools

The subjects for the study were students and teachers of seven Dallas Independent School District open-area elementary schools. They were matched with students and teachers from seven traditionally-constructed Dallas Independent School District elementary schools. The criteria for selecting the traditional schools, to assure a high degree of comparability between the two groups of schools, included similarity of the basic instructional program, ethnicity of the student bodies, socioeconomic status of the school communities, certain characteristics of the school faculties, classroom teacher allocation ratios, classroom teacher unit to pupil ratios, and data on salary expense per student.
Similarity of basic instructional program.--Traditional schools selected were found to have similar instructional programs to the open-area schools in reading, language, and mathematics. All schools used the same textbooks, teaching aids, materials, and supplies. Personnel and budget allocations were made on the same basis in both groups of schools. The instructional program requirements, as outlined in the Handbook for Primary Teachers (6), were being met by both groups of schools.

Ethnicity of students.--Pupil Accounting Department enrollment information was utilized to ascertain that the two groups of schools did have student bodies with similar ethnic composition. Most of the schools were predominantly black in racial composition with the Anglo population exceeding the Mexican-American population.

Socioeconomic status.--Mendro (23), Havighurst and Breese (14), Sexton (30), and Curry (5) all documented findings indicating correlation between socioeconomic status and measured ability and achievement. Such evidence emphasizes the need for carefully matching the two groups of schools.

The educational and income level of parents as per United States census tract information compiled in Research Report 72-110 (23) of the Department of Research and
Evaluation of the Dallas Independent School District was used as a basis for determining that the pupils in the two groups of schools had comparable environmental backgrounds. All of the school communities had mean family incomes of less than $9000 per year. Parents residing in twelve of the fourteen school communities had attended high school for a period of time.

**Teacher characteristics.**--Using District records and information (28), the two groups of schools were matched on the basis of the following characteristics of the faculties: sex, ethnic background, educational degree level, type of certificate, years of experience, and age.

Faculties of the two groups of schools consisted of approximately 70 percent Anglo and 30 percent minority teachers. Over 90 percent of both groups of teachers were female. The predominant degree for both groups was the bachelor's, and more than 85 percent had permanent certificates. Similar comparability existed regarding the characteristics of experience and age.

**Classroom teacher allocation ratio.**--Teachers were allocated on the basis of one teacher for each twenty-seven pupils in both the open-area and traditionally-constructed schools. This ratio does not include
administrators or other support personnel. Only regular classroom teachers were considered in determining this ratio.

**Classroom teacher unit to pupil ratio.** -- School principals may utilize allocated personnel in any organizational plan appropriate to the school. The resulting classroom teacher unit to pupil ratio of the organizational plans of the open-area and traditional schools was found to be similar. Analysis of the ratios revealed a a 0.2 variation in the two groups of schools studied.

**Salary expense per pupil.** -- The open-area schools were found to be spending only $13.00 per pupil more for teacher salaries than the traditionally-constructed group of schools.

**Achievement Test Data**

Permission was secured from the Dallas Independent School District to use the California Achievement Tests and the Comprehensive Tests of Basic Skills scores as recorded in the data bank of the institutional research program of the District's Department of Research and Evaluation. Data for the schools involved were retrieved from the data bank and appropriately processed for interpretation. Visits were made to the various schools.
to obtain individual records that were missing or incomplete in the data bank.

**Individualization of Instruction Data**

Consistent with the District's top priority goal of individualizing instruction, a major objective of the institutional research program of the Department of Research and Evaluation has been to determine the extent to which the District's educational program is individualized. A sample of District schools was assessed, and related data were entered in the institutional research data bank. Permission was secured to extract and analyze appropriate individualization data for the elementary schools in the study. Data were collected on an individual school basis for schools not included in the District sample.

**Positive Actions Toward School Data**

Utilizing official District records in the office of the Administrative Assistant-School Operations, the number of incidents of vandalism and the number of student suspensions were compiled, and an appropriate analysis was made for each school in the study.

**Organizational Climate Data**

The Macmillan Company granted permission for the reproduction and administration of the Organizational
Climate Description Questionnaire (see Appendix A). This instrument, with appropriate directions for administration, was delivered to each of the elementary schools involved in the reported study. The principal administered the questionnaire and returned all copies. The data were coded, punched into cards, and submitted to Donald Croft at New Mexico State University for scoring and interpretation.

District attendance records in the office of the Deputy Assistant Superintendent-School Operations, were used to make appropriate comparisons of attendance in the elementary schools involved in the study.

Procedures for Analysis of Data

The computer work for this study was done at the Skyline Career Development Center Computer Cluster. Data pertaining to the hypotheses were collected. The $F$ test for homogeneity of variance was applied and subsequent analyses made as appropriate using the $t$-test for independent samples. To determine whether any difference between observed scores could be legitimately attributed to the treatment effect (open-area elementary schools) or could reasonably have occurred by chance alone, the 0.05 level of significance was established as a criterion (29).
CHAPTER BIBLIOGRAPHY


CHAPTER II

SURVEY OF RELATED LITERATURE

A survey of current literature reveals many research studies related to educational facilities and the concept of open education. However, valid studies comparing the effects of open-area schools to those of traditionally-constructed schools are not to be found in abundance.

This chapter, in an effort to develop a significant background, includes summaries of literature relating to four topics: (1) History and Development of Open-Area Elementary Facilities, (2) Extent of Open-Area Elementary Facilities, (3) Effects of Open-Area Elementary Facilities, and (4) Need for Additional Research.

History and Development of Open-Area Elementary Facilities

Modernization of facilities with emphasis on the learner has been a slow process for American schools. Macbeth (36) indicated that traditional American school design and organization dates back to 1847 with the advent of the Quincy Grammar School in Boston, Massachusetts. This school was the forerunner of the traditionally-designed school, the prevailing choice of American school
administrators and architects until the mid-sixties. Castaldi (10) suggested that early day schools of this nation were very little more than a place of shelter for students and teachers to meet. Typically, furnishings were simple with benches for the students and a platform for the teacher. A row of windows on one side of the room provided "air conditioning," and the heating system was a fireplace or primitive wood or coal burning stove.

As Gores pointed out in the following statement, the early day schoolhouse was a simple structure constructed with few variations:

Not so long ago, a teacher was expected to to a good model of the general culture and a perfect model of the subculture. Teachers, therefore, were as plural as our culture. But variety never extended to the schoolhouse itself. Almost everywhere the schoolhouse was a nationally standardized art form, a chambered nautilus so uniform in its design as to be inter-changeable between Portland, Oregon, or Portland, Maine--or, to cite an even greater difference in subcultures, between the Bronx and neighboring Bronxville.

In the old days, whoever presumed to predict the future of the schoolhouse had to deal with few variables. After all the schoolhouse was a fixed and settled institution. And the future was expected to proceed at an orderly parade march, as it had in the past.

Today, however, prediction with any confidence is more elusive. The future is more obscured than ever because there are so many options, and now the places of education themselves are changing fast in response to both educational and technological change (21, p. 10).
Beginning of Facility Improvement

With an ever increasing population and an increase in the percentage of children who attended school, it became necessary to build additional facilities with greater capacities. Schools began to have fewer students per room compared to the early one-room schools, which often had as many as fifty-five students per room (36).

The late Harold Nichols, School Plant Planning Specialist at North Texas State University, often mentioned the impact of the Works Progress Administration upon the nation's school facilities. While he cited many limitations of WPA facilities, he was of the opinion that many communities were able to provide additional, and in many instances better, facilities as a result of the program. Many of the nation's athletic stadiums and gymnasiums were products of the WPA and otherwise might never have been constructed. McClurkin, addressing the impact of the WPA, stated that the low ebb in school plant planning in this century probably was reached in the later years of the Great Depression, when Work Progress Administration worked directly in local school districts to construct buildings with work relief crews on "plans" worked up by WPA offices, with no consultation with state or local specialists, and with minimum local financial support (38, p. 16).

During the late 1930's and the 1940's, the nation's schools slowly became more modern, and improvements such
as movable desk-chair combinations, green chalkboards, and various audiovisual aids began to appear. As schools became larger and therefore more complex to plan and build, architects became involved (10). Even though the designs of the architects emphasized shape, form, and style, the classroom itself was basically unchanged. The new schools remained big boxes filled with smaller boxes with an ever increasing number of students each year. In 1961, an Educational Facilities Laboratory publication made the following statement:

By 1958, when Educational Facilities Laboratory was established, this was the state of the art of housing students. Most schoolhouses were big boxes filled with equal sized little boxes, an arrangement of space which mirrored exactly the time-honored arrangement of students into classes of equal size (15, p. 5).

According to Caudill (11), the year 1950 marked the beginning of educational architecture based on the instructional requirements of children. During that year, a large group of architects joined with educators from across the country to discuss common problems associated with constructing school facilities and providing better education. As a result, most facilities are no longer being constructed merely to provide housing but rather to facilitate the instructional process and to accommodate the programs of education. For too many years, the educational program had been designed to conform to the
constraints of the facility. The following statement is Silberman's description of the traditional school:

It is not possible to spend any prolonged period visiting public school classrooms without being appalled by the mutilation visible everywhere—mutilation of spontaneity, of joy in learning, of pleasure in creating, of sense of self. The public schools—those "killers of the dream," to appropriate a phrase of Lillian Smith's—are the kind of institution one cannot really dislike until one gets to know them well. Because adults take the schools so much for granted, they fail to appreciate what grim, joyless places most American schools are, how oppressive and petty are the rules by which they are governed, how intellectually sterile and aesthetically barren the atmosphere, what an appalling lack of civility obtains on the part of teachers and principals, what contempt they unconsciously display for children as children (44, p. 10).

Spodek, maintaining that the nation was amenable to educational change, addressed the problems associated with American elementary schools as follows:

From the time we began to press for universal education as a social goal, we in the United States have had problems in the schools—many of them problems of "fit." When schools were designed for a small minority of the population, any child who couldn't conform to the school's expectations was simply expelled. If he didn't "fit the school" the problem was with him, not with the school—so we let him go somewhere other than to school—home, or to work (45, p. 140).

Goodlad (19) emphasized the need for and cited extensive efforts toward improving the health of the American elementary school in an era of innovation and change.
Kozol (32), Glasser (18), Lessinger (35), and Illich (27) are other examples of American writers who expressed their misgivings about the quality of our nation's elementary schools.

With the demands for improved educational programs to meet the ever expanding needs of students, school architecture increasingly became a primary focus of change. Gross and Murphy emphasized the point in the following way:

To put new teaching and learning procedures into actual effect in a particular school always comes down to logistics. An educational innovation must not only be conceived, understood, and adopted at the policy level--it must be designed to work in a specific situation. Here is where many a school administrator has felt thwarted because "the building wouldn't get out of the way" (24, p. 15).

Graves supported this viewpoint:

In too many cases, the schoolhouse is getting in the way of education. If the school program should dictate school space and not the other way around, is it possible to carry out new educational theories in an eggcrate school building vintage 1900 (22, p. 16)?

Advent of Open-Area Facilities

In the late 1950's and early 1960's, architects nationwide began to design some open-plan schools. As Gross and Murphy (24, p. 9) described, it was "a new spirit that enlivened American education--a spirit of innovation, experimentation and venturesomeness." New
concepts of schooling evolved as the nation's educational leaders grappled with the challenge of housing an exploding student population preparing to live in a rapidly changing, highly technical world whose future no one could predict (28).

Goodlad (19), Anderson (3), and others emphasized and encouraged multi-aged grouping, continuous progress, team teaching, non-gradedness, individualized instruction, and many other concepts appropriate to open-area facilities. First efforts to achieve the flexibility required by these emerging concepts incorporated various size rooms and/or movable partitions. As in the traditionally-constructed school, the educational program was forced to conform to fixed room sizes rather than to the learning needs of the individual students. Movable partitions were not as satisfactory as anticipated because of limited sound proofing, mechanical failure, high initial cost, and short life. In the interim, facilities were constructed incorporating multiple classrooms clustered about common areas, libraries, and resource centers.

In the late 1960's, the completely open-area school made its debut, and since its inception, it has assumed many different configurations with much variation in size and shape. Brunetti (6) cited, as the first open-area school to attract nationwide attention, an elementary
facility built in 1957 in Carson City, Michigan. Across the country, more emphasis was being placed on building schools to facilitate the instructional process. The resulting open-area schools were more versatile. These facilities could serve various functions. They could be expanded for growth and adapted to program changes more quickly and more economically than their forerunners, the traditionally-constructed elementary schools. Wakeland (46) pointed out that "the elimination of interior partitions and substitution of movable furniture capitalized on adaptability of people instead of relying on the manipulation of architectural elements" and "in terms of architecture, form was beginning to be based on function."

A whole new spectrum of possibilities in school design evolved when architects started using air conditioning and carpeting. Dole (13) cited statistics that show carpet use in public schools increasing from approximately two million square feet in 1962 to seventy-five million in 1972. Abramson (1) cited a 1973 survey on carpeting compiled by the periodical, American School and University. The basic question was, "Does your district use carpeting in any instructional areas of your schools?" An overwhelming 87.3 percent said "yes." Respondents indicated the opening of ninety-two new schools, forty-two of which were elementary schools. More than 25 percent of the
buildings reported had 90 to 100 percent of their floors covered by carpet. While the sampling was limited (933 schools), the results were so overwhelming that the basic thrust cannot be doubted. The "acoustical floor covering" aids in making open class spaces quieter.

King, addressing the era of the 1960's, stated that
cchanges in school design during the sixties produced a new spirit of openness and informality in the best school buildings built in the decade. Team teaching, the development of non-graded schools, the interest in the British open schools, the efforts to make individualized instruction--long a cliche--into a reality, all contributed to a change in spirit in education that was reflected in the responsive schools of the era (31, p. 10).

Schools that are truly open area are constructed with the fewest possible internal constraints on grouping and organizing children for learning. Campbell (7) placed much emphasis on flexibility in that schoolhouses must last for many years. He emphasized that schools must be able to meet the demands of education, enrollment, and change within the community. Our world today is in a period of rapid change, and educational space is difficult to plan in view of future possible changes in teaching procedures. If educators build in as much flexibility and leeway for expansion as possible, it will be much easier to modify the facility to accommodate instructional program changes that evolve in an era of experimentation, innovation, and change. While today there is a definite trend toward
openness with great variations in grouping and organization, tomorrow's improvements may require that they be closed up and modified.

While many educators equate the modern open-area facility to the one-room schoolhouse of early days, the modern counterpart is vastly different in architecture and educational program. Mathias (37) stressed the contributions of open space to the flexibility required for team teaching, flexible scheduling, multi-age grouping, and other instructional innovations. A 1970 conference of educators (14) emphasized that vast differences exist between the open-plan school of today and the little red schoolhouse of 100 years ago. Frazier (17) urged educators at every level to work for greater freedom and less authoritarianism with openness being the key concept. During the last decade, the spotlight of education has been on the learner. Previously, for many years, teachers and psychologists had spoken about individual differences. Curriculum builders and principals had been stressing the need to adapt the program to the child. Accordingly, the administrator and architect had been stating their dedication to providing a child-centered facility. In spite of all of these efforts, the student as an individual had all but been forgotten. Appropriately, as herein indicated, viable efforts have recently been made to break out of the "lockstep" of traditional approaches and to provide a
total educational program responsive to the learner (2). The open-area school is a vital resource in this effort and is very evident throughout the nation.

Extent of Open-Area Elementary Facilities

Nation's Schools, a McGraw-Hill publication for school administrators, cites and disseminates information about outstanding new educational facilities. The publication features, in a section entitled "Award Winning Schools," those school designs considered for exhibition at the annual meeting of the American Association of School Administrators. Table I indicates that for the five-year period, 1968 to 1972, 61 percent of the "award winning" schools were designed as flexible open-area facilities.

TABLE I

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number Award Winning Schools</th>
<th>Number of Winners with Flexible Open Space</th>
<th>Percent Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>1968</td>
<td>5</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>1969</td>
<td>10</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>1970</td>
<td>6</td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>1971</td>
<td>8</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>1972</td>
<td>7</td>
<td>4</td>
<td>57</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>22</td>
<td>61</td>
</tr>
</tbody>
</table>
Brunetti (5) discussed a 1970 survey, conducted as part of the open space research program at Stanford University. This survey indicated that 54 percent of over 2500 new schools constructed in 1967, 1968, and 1969 in forty-three states were of the open-space design. The state of California was cited in the survey as being the pace-setter in open-space facilities with 84 percent of its schools being open-space facilities. New York only had 19 percent of its schools in the open-space category, while Florida, Texas, Washington, and Wisconsin reportedly had a high degree of open-space development. In the same survey, Brunetti noted that 91 percent of the elementary schools in the Architecture Exhibit at the 1971 American Association of School Administrators Convention were of the open-space design. The survey emphasized new requirements brought about by innovative curriculum materials and equipment, new patterns of student and staffing organization, and new time allotments for program planning and instruction as the basis for most of the new open-space schools.

Carioti, assessing the prevalence of open-plan schools across the country, reported that

open-plan schools--or schools with open-space included--are almost commonplace in the United States today. Over 50 percent of all elementary and secondary schools built within the last three years are open-plan design. The total cost of open-space schools built within the last five years has topped $1 billion (9, p. 2).
Many of the nation's school districts are committed to planning new or remodeling present facilities to feature open-space. Since 1969, all of the nine elementary schools built in Dallas have been open-area schools. One 1920 vintage Dallas elementary school has been remodeled into a modern open-area facility. A survey of the seven largest Texas school districts comprising the Texas Council of Major School Districts revealed that seventeen of the twenty-three elementary schools constructed by these districts in the last five years have been of the open-area type. In Chicago, Illinois, spaces for 33,000 elementary and middle school children have been provided in the last thirty months. All Chicago buildings are planned to feature some open interiors (26). Washington, D. C. is committed to producing open-plan schools. Open-area classrooms are created by renovating existing facilities, building open-area additions, and designing all new facilities to feature open-space instructional areas (23). Randazzo (42) related the efforts of Hartford, Connecticut, to provide improved education in what is possibly the largest urban program of its kind in the country. Featuring open-space ungraded classrooms, the program has grown from fifty to 10,000 children in four years. The program calls for the total elementary system to be involved in open education by 1974.
Though generally considered less than a decade old, the concept of open-area schools has been widely adopted. Thousands of examples of it exist across the nation in both large and small districts, and the number of open-area schools continues to increase. Salz made the following comment on the growth of open-area schools:

Open plan school architecture has become de rigueur and it is the rare district that does not boast of its new facility without walls. While it would be inaccurate to suggest that more than a small minority of the country's students are in open-classrooms today, the number is steadily growing (43, p. 388).

Effects of Open-Area Elementary Facilities

Research comparing learning in open-area elementary facilities with learning in traditional elementary facilities is not available in great abundance. Brunetti (5, p. 8) felt that "in the final analysis the true merits of open space can only be judged by its effects upon students and teachers." He pointed out that while a wide range of opinions and observations have been rendered as to the effectiveness of open-area facilities, only a limited number of studies have possessed sound evaluation techniques and valid data. Brunetti related that those favoring the concept of open space often claim that it results in high achievement and better teaching, while those not favoring open space advocate that it results in unneeded
chaos and confusion. Closely related to the question of learning is the question of the impact of open space on teacher performance and pupil actions.

Open-Area Schools and Pupil Performance

Brunetti (5) cited a long-range research and development program—the School Environment Study—conducted by the Stanford University School Planning Laboratory and funded by Educational Facilities Laboratories. The chief objective of this research effort was to determine the overall significance of alternative spatial environments for students and teachers. Findings indicated no consistent differences in academic achievement in open-space and conventional schools as measured by standardized achievement tests. The report did indicate that as long as academic achievement is not adversely affected, the improvement of such factors as motivation, self direction, self concept, self responsibility, inquiry skills, and peer relations are seen to be equally important in rounding out a student's achievement profile (5, p. 9).

The report further indicated that while these concepts are difficult to measure, students in a Canadian open-space school did in fact indicate improvement in each category.

A study made by LaForge (33) compared personality characteristics of students in an open-space facility with those of students in a traditionally-constructed facility. While the emphasis of the study was on personality
characteristics, student achievement levels were considered along with other factors in terms of their influence on personality. Results of the study indicated that to date the standardized test scores of one group have not been found to be superior to those of the other group.

Johnson (29) reported a study comparing achievement of students in an open-space, innovative instructional program with students in a traditional classroom program as measured by the Iowa Test of Basic Skills. Findings indicated both programs were above average, and any differences found to exist in achievement could only be attributed to chance. The model school did have a greater number of small groups, greater flexibility, and more frequent regrouping for instruction. Model school students spent more time in independent study and less time in teacher-led activities with more time for student interaction. Open-space students spent less time in groups, with the teachers spending more time with individual students and listening to student presentations.

Kennedy and Say (30), in a study designed primarily to determine the effectiveness of an open-area school, compared the achievement and I.Q. scores of children in an open-area school with those of children in a traditional school. Pupils of both schools possessed comparable socioeconomic backgrounds. Findings indicated that no
definite conclusions could be reached as to the superiority of either instructional setting in producing cognitive improvement during a period of one year of instruction.

A study by the Division of Planning and Development of the York County Board of Education (48) compared reading and mathematics achievement of grade one pupils in open-space facilities with similar pupils in traditionally-constructed schools. Pupils were administered the Canadian Cognitive Abilities Test and the Metropolitan Achievement Test. Findings indicated a normal distribution of scores both in open-plan and traditional-plan schools with no significant differences between the two settings.

McRae (39) tested the hypothesis that pupils entering the secondary schools from open-area schools did not perform as well on the Gates-MacGinitie Reading Test as did students from the traditional classes. Pupils were tested at the time of entry into secondary school and again a year later. The null hypothesis was retained, but after one year of traditional instruction pupils tended to catch up.

Warner (47) conducted a study comparing students' and teachers' performances in an open-area facility and in self-contained classrooms. Careful consideration was given to the process of selecting the sample of children for the study. Pupils in grades two, three, and four
were randomly assigned to sections in each environmental setting on the basis of sex and age. While interest, motivation, experience, and quality rating of teachers were all given due consideration, complete equality of teachers was not achieved. Other factors such as materials, curriculum, etc. were considered equal for both groups. The study revealed the performance of the two groups of pupils to be equal and similar on the basis of comparison of academic achievement, teacher-pupil verbal interaction, and organizational climate of the faculties as perceived by the teachers. Warner did note that the open-area facility had a very apparent advantage from the standpoint of flexibility.

Open-Area Schools and Teachers

Addressing the question of teacher performance, Brunetti (5) maintained that the team or cooperative structure usually found in open-space facilities had a positive influence on overall teacher performance. The most significant problem pertaining to this type of staffing was found to be that of interpersonal relations. The team arrangement was reported to effect greater student involvement with less group-oriented work than the traditional counterpart. Teachers were found to provide each other with more advice and feedback about their teaching. The open-space teachers were found to be more
satisfied with teaching than the conventional teachers were. In nine open-space schools, 46 percent of the teachers indicated a high degree of satisfaction. A random sample of conventional schools found only 28 percent of the teachers to be highly satisfied.

Cheek (12) conducted a survey to determine open-space elementary school practices and conditions. The sample included five open-space schools in California and two open-space schools in Michigan. Among the findings was the opinion of teachers that no exact purpose existed for using open space in various elementary schools. The noise level was a concern, and desirable student behavior was not necessarily facilitated. The teachers did indicate, however, that pupil-teacher interactions were more positive. The teachers disagreed as to whether the open-space concept hindered or facilitated teacher interaction. The lack of training, without established techniques, for principal and teacher roles, vastly different in open-space facilities, was another concern voiced. Team teaching and non-gradedness were not necessarily facilitated. It was also noted that teacher selection should be a vital concern, and only teachers willing to accept the notion of change should be placed in an open-space setting.

Ellison, Gilbert, and Ratsey (16) observed one open-area school and one traditional school for a period of
two weeks to compare verbal interaction and teacher utilization of time. They found that handling routine matters consumed more time in the traditional classroom. In the open-space setting, more time was devoted to observing other teachers, interacting with adults, and making the transition to open space. Instructional supervision and the presentation of information were comparable in the two settings. A general conclusion was that spatial differences in the two types of schools did not appear to affect greatly the practices found in each setting.

Meyer, Cohen, and others (40) conducted a study comparing the working relationships, activities, and overall influence of 110 teachers in nine open-space schools to 120 teachers in eight traditional-plan schools. Of particular interest to the researchers were the areas of teacher ambition, orientation, formal evaluation, job satisfaction, school authority structure, and personal background information. Results revealed that open-space teachers were more satisfied, felt more autonomous, and contended that they had more influence in making all kinds of decisions related to the operation of the school.

Pritchard and Moodie (41) surveyed the opinions of ninety-three teachers in open-area schools and sixteen teachers formerly in open-area schools. Approximately
90 percent of the teachers reported that they enjoyed open-area teaching, were at ease with other teachers in close proximity, and were of the opinion that as much or more learning took place and that children enjoyed the open-area school. Seventy-five percent of the teachers reported teaching differently in the open-area setting with team teaching as the organizational pattern. They also indicated that the open-area concept was appropriate for the age group they taught and that two or three class groups was the ideal team size. Over 50 percent reported that they had requested to teach in an open-area setting and would do so again. Over 50 percent believed that visitors seldom interfered, that parents had confidence in the concept, that pupils developed better, and that the intermediate grades were most appropriate for open-area instruction. Queried as to reservations, 75 percent of the teachers stressed the need for an enclosed area in which to conduct certain classes. More teacher preparation time and in-service training were also felt necessary to effectively handle the open-area concept. Assessing the open-ended questions, the authors noted that teachers supported the open-area concept because they felt it was conducive to team teaching and encouraged independence and innovation within the pupils.

Warner's study (47), previously cited in relation to student achievement, found teacher performance in
traditional and open-space settings similar and equal in the areas of teacher-pupil verbal interaction and the teachers' perceptions of organizational climate.

Open-Area Schools and Pupil Actions

Cheek (12) included in his study the question of whether or not the open-plan school facilitated desirable pupil behavior. His findings indicated no evidence of desirable pupil behavior being facilitated by the open-plan setting. He did indicate that noise level was a problem in open-space facilities.

An evaluation by the Halton County (Ontario, Canada) Board of Education (25), involving grade five and six students in open-plan and traditional settings and utilizing such techniques as direct observations, curiosity scales, questionnaires, and informal discussions, revealed the open-plan students to possess better attitudes toward school and toward themselves and to manifest fewer discipline problems. Positive reactions were secured regarding freedom of movement, interaction with a greater number of pupils, and greater degree of pupil responsibility. However, students were found to waste more time and create more noise in the open-plan setting. Generally, there was a marked increase in student attendance, and the reactions of parents indicated general approval of continuous progress and cooperative teaching. The authors considered
this study to be a short-term non-scientific analysis, but it does indicate the need for continued assessment of the open-plan concept.

Ledbetter (34) identified student and teacher reactions to their school facility and presented findings on the strengths and weaknesses of open-plan schools. Results indicated open-space facilities for teaching were favored by all respondents but were most favored by elementary pupils. The noise level was found to be a concern and was considered to be disruptive, especially in high school.

LaForge (33) examined the effect of an open-space design upon the personality characteristics of students using the factors of student achievement levels, teacher attitude, curriculum, administrative organization for instruction, building design, and attendance area socioeconomic status. His findings indicated the personality characteristics of the pupils in the open-space schools to be little different from those of the pupils in the traditional schools. Open-space pupils were found to exhibit more sympathy for the needs of others than did students in the traditional schools.

A study by Carbonari (8) assessed the effectiveness of an open elementary school, discussed the attitude change of students as a function of time, and compared the
attitude of open-area elementary school teachers to national norms of teachers. Findings indicated that the experimental group children were more independent, lively, self-reliant, extroverted, and anxious than the control group children. The differences found among the children were not thought to be a result of teacher effect, as the teachers were found to have similar characteristics to the teachers in the larger population.

Need for Additional Research

Evidence has been presented which indicates a quest by educators during the last decade to improve the educational product of the nation's schools. A primary focus of much of this educational change has been school architecture. As a result, a majority of the new elementary schools constructed coast to coast in the last five years have been of the open-area design. Carefully controlled, well documented studies utilizing specific facts and descriptive data to compare the effects of open-area schools to traditionally-constructed schools are few. Existing studies fail to indicate conclusive evidence of improved achievement test scores for pupils in open-area schools as a result of the design of the facility. As Brunetti emphasized,

Before the questions related to student and teacher performance can be
answered, there are many intervening factors that must be considered. It is unlikely that the school building itself has any direct measurable effect on whether children learn to read better or teachers are more inspiring; rather, it will permit or restrict certain functions that may or may not be related to performance measures (5, p. 8).

Cheek (12) noted the importance of the teacher in facilitating the instructional program of the open-space school. He indicated the necessity of determining and selecting teachers who are willing to accept the notion of change. Meyer, Cohen, and others (40) noted the relationship of open-space teachers to the decision-making process of the school. These two studies clearly indicate the need for additional research related to open-space staffing. Kennedy and Say (30), comparing the effects of open-area versus closed-area schools on the cognitive gains of students, called for additional longitudinal research. They also recommended that future studies measure the affective skills development of the involved pupils. LaForge (33) recommended additional research "to explore and continually evaluate the impact of the open-space designed school facility upon the personality characteristics of students."

This study is not a replication of an existing study, although others have been done that are similar.
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CHAPTER III

PROCEDURES FOR COLLECTING AND PREPARING THE DATA

Collecting the Data

Data Collected for Matching the Schools

Open-area and traditional schools of the study were matched to assure a high degree of comparability between the two groups. Data were collected for several criteria utilized in the process of matching the schools.

Similarity of basic instructional program.--Data pertaining to the instructional program were secured from the following official records of the Dallas Independent School District:

1. School visitation reports by staff members,
2. Textbook inventory records,
3. Instructional equipment inventory records,
4. Supply allocation records,
5. Official class schedules, and
6. Interim program process evaluation reports.

Ethnicity of the student bodies.--Data that were needed to establish the ethnicity of each school in the
study were obtained from official pupil personnel records of the District. These records are compiled and maintained by the District's Pupil Accounting Department. The specific report for this study was the February, 1973, C56-3 enrollment report.

Socioeconomic status of the school communities.--Data necessary to match the two groups of schools on the basis of socioeconomic status were extracted from United States census tract information compiled in Research Report 72-110 (3) of the District's Research and Evaluation Department.

Certain characteristics of the faculties.--Official records of the District's personnel office and information compiled in Research Report 72-170 (4) were utilized to determine the sex, ethnicity, degree level, certification, experience, and age of the faculties of the two groups of schools.

Classroom teacher allocation ratio.--Data related to this criterion for matching the schools of the study were secured from official information contained in the District's 1972-73 organizational handbook (1).

Classroom teacher unit to pupil ratio.--This information was secured from the February, 1973, C56
enrollment report compiled by the District's Pupil Accounting Department.

Salary expense per pupil.--These data were taken from the District's February, 1973, ESEA--Title I--Comparability Report.

Achievement Test Data

The achievement test scores in reading, language, and mathematics, as measured by the California Achievement Tests in grades one and two and the Comprehensive Tests of Basic Skills in grade three, were secured via computer terminal from the data bank of the institutional research program of the District's Department of Research and Evaluation. Visits were made to individual schools to collect missing data. The data collected from the various tests administered as a part of this research program were utilized to assess the effectiveness of various educational programs operating in the District.

Individualization of Instruction

Permission was also secured to extract data from the District data bank indicating the extent of individualization of instruction as reflected by the Individualization of Instruction Inventory. Data were collected on an individual school basis for schools in the study that were not included in the District sample.
Actions Toward School Data

From official records compiled and maintained by the District's School Operations Division, pertinent data were secured related to the rate of daily attendance, the number of acts of vandalism, and the number of pupil suspensions.

Organizational Climate Data

Permission was secured from the Macmillan Company to reproduce and administer the Organizational Climate Description Questionnaire to the faculties of each school involved in the study. The instrument, with appropriate directions, was delivered to each school and administered to the faculty by the building principal. From this questionnaire, information pertaining to the existing organizational climate of each school in the study was obtained.

Preparing the Data

Data used in the process of matching the open-area and traditional schools were contained in various official records of the District. These data were extracted, means were computed, and appropriate tables depicting the information obtained were established.

Achievement test and individualization of instruction data for most of the schools studied were on computer
tape in the District's data bank. Visits were made to individual schools to collect missing data. Through a remote terminal facility, the data were recalled and printed. It was then necessary to submit the data and a program designed to establish group means and standard deviations to the computer at the Skyline Computer Center. The data produced for each school in the study were then recorded on a user originated form for ease of handling and subsequent analysis. The $F$ test for homogeneity of variance was applied, and subsequent analysis was made as appropriate using the $t$-test for independent samples (2, p. 182).

Data related to the concept of positive actions toward the schools were manually retrieved, compiled for each school, and tested with the $t$-test for independent samples as in the above process.

The Organizational Climate Description Questionnaire instruments were collected from each school. The information was entered on an eighty-column form for the keypunch operator. A coding system was devised to assure systematic entry of the data into the proper column of the card. The data were then punched into the cards and submitted to Donald Croft at New Mexico State University for scoring and interpretation. After scoring, the data were returned in computer print-out form for subsequent analysis.
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CHAPTER IV

ANALYSIS OF THE DATA

The statistical analysis of the data is presented in two major sections in this chapter. The first section is an analysis of the data compiled in the process of matching the open-area and traditional schools, and the second section pertains to the testing of the hypotheses of the study.

The t-test for independent samples was used in the analysis of the data testing the hypotheses. The following assumptions must be made when using the t-test:

1. That the population from which each sample has been drawn is distributed in a normal fashion.
2. That each sample is representative of the population from which it is drawn.
3. That each sample was drawn in such a way as to assure independence within and between groups.
4. That the population variances are equal.

There has been a great deal of research conducted on the effect that failure to meet the above assumptions has on the level of significance obtained. Generally, the assumptions of normality and homogeneity of variance can be violated with little effect (1). This is
particularly true when the sample sizes are equal, as is the case in this study.

The assumption dealing with the representativeness of the sample is crucial. In generalizing about variable relationships that are suggested by statistical tests computed on sample data, the sample must be representative of the population under consideration. Steps must be taken to insure that the sample has not been drawn in such a fashion that it is a biased representation of the population under study. The first section of this chapter related to matching the schools establishes that fact.

The assumption dealing with independence within groups is also crucial. Since there was no guarantee that students within each school were independent, the school was used as the unit of analysis. Because there was independence between groups, the $t$-test for independent samples was used.

**Analysis of the Data Used to Match the Schools**

The two groups of subjects for this study were students and teachers of the Dallas Independent School District. A total of fourteen elementary schools was involved in the study with seven of the schools being of the open-area type of construction. The District has a total of nine open-area elementary schools, but
but two were deleted from the study because they had only been in operation for a short period of time. The seven open-area elementary schools selected were matched with seven traditionally-constructed elementary schools. The following criteria were used to match the schools:

1. Similarity of the basic instructional program,
2. Ethnicity of the student bodies,
3. Socioeconomic status of the school communities,
4. Certain characteristics of the faculties,
5. Classroom teacher allocation ratios,
6. Classroom teacher unit to pupil ratios, and
7. Salary expense per pupil data.

**Similarity of the Basic Instructional Program**

While the District has the individualization of instruction as one of its priority goals, all schools are committed to a basic instructional program. The two groups of schools in the study utilized this basic instructional program for the primary grades as outlined in the *Handbook for Primary Teachers* (3). All schools involved in the study used the *Houghton Mifflin* basal reading series as the key basal reading program with the Economy series as the co-basal reading program. The basal readers serve as the medium through which the basic reading skills such as word attack, phonetic analysis, structural analysis, comprehension, and listening are
taught. The *Handbook for Primary Teachers* (3), which provides detailed instructions for the teachers implementing this basal reading program, was utilized in all the schools. *New Directions in English*, which emphasizes discovery and inquiry in helping children to think for themselves, was the basal language textbook used. *Better Handwriting for You*, the state-adopted handwriting text was used in all of the schools involved in the study. *From Sounds to Words* was the basal spelling text used in grade one, while *Spelling Correctly* was used in grades two and three. Mathematics instruction centered around the state-adopted basal series, *Elementary School Mathematics*, books I, II, and III.

To assure proper implementation of this basic instructional program, the District specifies in the *Handbook for Primary Teachers* (3), in addition to the basal textbooks listed above, the instructional aids, permanent equipment, and consumable supplies necessary to successfully effect the program. The Operations Division then takes steps to ascertain that each school requisitions, receives, and properly uses the necessary items.

The instructional time schedules for all of the schools involved in the study were approved by the District and certified to meet the time requirements as required
by Bulletins 617 and 560 of the Texas Education Agency. The open-area and traditional schools had the necessary aids, equipment, and supplies and were conducting comparable instructional programs as directed by the policies and procedures of the school district and Texas Education Agency.

**Ethnicity of Student Bodies**

Enrollment information, compiled by the District's Pupil Accounting Department, was utilized to ascertain that the open-area and traditional schools did, in fact, have student bodies with similar ethnic composition.

Table II presents the ethnic composition of the individual schools comprising the two groups of schools studied. The data in Table II suggest that the ethnicity of the student body of the selected traditional schools closely resembled that of the open-area schools. Most of the schools were predominantly black in racial composition with the Anglo population exceeding the Mexican-American population.

**Socioeconomic Status of the School Communities**

Researchers in the field of education have long been aware of the positive correlation that exists, in most cases, between socioeconomic status and measured academic ability and achievement. Mendro (5) found the
TABLE II
STUDENT BODY ETHNICITY*

<table>
<thead>
<tr>
<th>Schools</th>
<th>% Black</th>
<th>% Anglo</th>
<th>% Mexican-American</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-Area Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>98.82</td>
<td>1.18</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
<td>41.21</td>
<td>58.66</td>
<td>0.13</td>
</tr>
<tr>
<td>3</td>
<td>97.82</td>
<td>0.15</td>
<td>2.03</td>
</tr>
<tr>
<td>4</td>
<td>99.13</td>
<td>0.87</td>
<td>0.00</td>
</tr>
<tr>
<td>5</td>
<td>89.41</td>
<td>2.12</td>
<td>8.47</td>
</tr>
<tr>
<td>6</td>
<td>99.49</td>
<td>0.51</td>
<td>0.00</td>
</tr>
<tr>
<td>7</td>
<td>96.28</td>
<td>1.08</td>
<td>2.64</td>
</tr>
<tr>
<td>Mean</td>
<td>88.88</td>
<td>9.23</td>
<td>1.89</td>
</tr>
<tr>
<td>Traditional Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>98.83</td>
<td>1.17</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td>14.29</td>
<td>73.21</td>
<td>12.50</td>
</tr>
<tr>
<td>10</td>
<td>88.81</td>
<td>3.07</td>
<td>8.12</td>
</tr>
<tr>
<td>11</td>
<td>99.91</td>
<td>0.09</td>
<td>0.00</td>
</tr>
<tr>
<td>12</td>
<td>100.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>13</td>
<td>97.99</td>
<td>0.27</td>
<td>1.74</td>
</tr>
<tr>
<td>14</td>
<td>97.64</td>
<td>0.32</td>
<td>2.04</td>
</tr>
<tr>
<td>Mean</td>
<td>85.36</td>
<td>11.16</td>
<td>3.48</td>
</tr>
</tbody>
</table>


higher the socioeconomic level, the higher the student aptitude and achievement scores. Havighurst and Breese (4), Sexton (7), and Curry (2) all documented similar
findings in related studies. Such research emphasized the necessity of carefully matching the open-area and traditionally-constructed schools in order to ascertain that the children involved in the study had comparable environmental backgrounds. Table III presents the median

**TABLE III**

**MEDIAN FAMILY INCOME AND EDUCATION BY SCHOOL COMMUNITY**

<table>
<thead>
<tr>
<th>Schools</th>
<th>Income</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-Area Schools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>$11,800</td>
<td>10.7</td>
</tr>
<tr>
<td>2</td>
<td>8,975</td>
<td>10.2</td>
</tr>
<tr>
<td>3</td>
<td>8,771</td>
<td>11.8</td>
</tr>
<tr>
<td>4</td>
<td>7,374</td>
<td>10.9</td>
</tr>
<tr>
<td>5</td>
<td>7,374</td>
<td>10.9</td>
</tr>
<tr>
<td>6</td>
<td>7,333</td>
<td>10.7</td>
</tr>
<tr>
<td>7</td>
<td>4,488</td>
<td>8.6</td>
</tr>
<tr>
<td>Mean</td>
<td>$8,016</td>
<td>10.5</td>
</tr>
</tbody>
</table>

| Traditional Schools |          |           |
| 8          | $11,593  | 12.4      |
| 9          | 9,184    | 9.7       |
| 10         | 7,933    | 11.1      |
| 11         | 7,820    | 11.4      |
| 12         | 7,874    | 11.7      |
| 13         | 7,838    | 11.3      |
| 14         | 4,488    | 8.6       |
| Mean       | $8,104   | 10.8      |
family income and median years of education for each of the school communities involved in the study. The data in Table III suggest that the mean family income and mean educational level of the two groups of schools were similar. All of the school communities had mean family incomes less than $9,000 per year. Parents residing in twelve of the fourteen school communities had attended high school.

**Characteristics of the School Faculties**

Teacher characteristics were a key criterion in the matching of the open-area elementary schools and traditionally-constructed elementary schools. Official certified records, data, and information of the Dallas Independent School District were used to select a group of traditional schools whose faculties possessed similar characteristics to those of the open-area schools. The teacher characteristics considered were sex, ethnicity, educational degree level, certification, experience, and age. Tables IV, V, VI, VII, and VIII present appropriate data related to these characteristics.

Table IV presents the ethnicity of the faculties of the two groups of schools in the study. The data in Table IV reveal that faculty ethnicity was approximately the same for both groups of schools. Open-area schools
### TABLE IV
**FACULTY ETHNICITY**

<table>
<thead>
<tr>
<th>Schools</th>
<th>% Anglo</th>
<th>% Black</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open-Area Schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>64.0</td>
<td>36.0</td>
</tr>
<tr>
<td>2</td>
<td>78.0</td>
<td>22.0</td>
</tr>
<tr>
<td>3</td>
<td>69.0</td>
<td>31.0</td>
</tr>
<tr>
<td>4</td>
<td>71.0</td>
<td>29.0</td>
</tr>
<tr>
<td>5</td>
<td>65.0</td>
<td>35.0</td>
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<tr>
<td>6</td>
<td>65.0</td>
<td>35.0</td>
</tr>
<tr>
<td>7</td>
<td>70.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Mean</td>
<td>68.8</td>
<td>31.2</td>
</tr>
<tr>
<td><strong>Traditional Schools</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>75.0</td>
<td>25.0</td>
</tr>
<tr>
<td>9</td>
<td>75.0</td>
<td>25.0</td>
</tr>
<tr>
<td>10</td>
<td>68.0</td>
<td>32.0</td>
</tr>
<tr>
<td>11</td>
<td>75.0</td>
<td>25.0</td>
</tr>
<tr>
<td>12</td>
<td>70.0</td>
<td>30.0</td>
</tr>
<tr>
<td>13</td>
<td>67.0</td>
<td>35.0</td>
</tr>
<tr>
<td>14</td>
<td>65.0</td>
<td>35.0</td>
</tr>
<tr>
<td>Mean</td>
<td>70.7</td>
<td>29.3</td>
</tr>
</tbody>
</table>

had a mean of 68.8 percent Anglo and 31.2 percent black teachers. Traditionally-constructed schools had a mean of 70.7 percent Anglo and 29.3 percent black teachers.

Tables V and VI present the sex, educational degree level, and certification percentages of the faculties of the two groups of schools in the study.
TABLE V
SEX, EDUCATIONAL DEGREE LEVEL, AND CERTIFICATION
OF FACULTIES IN OPEN-AREA SCHOOLS

<table>
<thead>
<tr>
<th>Open-Area Schools</th>
<th>Sex</th>
<th>N</th>
<th>%</th>
<th>Educational Degree Level</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BA (%)</td>
<td>MA (%)</td>
</tr>
<tr>
<td>1</td>
<td>M</td>
<td>1</td>
<td>7.0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>14</td>
<td>93.0</td>
<td>86</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>9</td>
<td>100.0</td>
<td>89</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>1</td>
<td>4.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>96.0</td>
<td>83</td>
<td>17</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>17</td>
<td>100.0</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>1</td>
<td>4.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>96.0</td>
<td>83</td>
<td>17</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>100.0</td>
<td>83</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>100.0</td>
<td>87</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
<td>3</td>
<td>2.2</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>142</td>
<td>97.8</td>
<td>84</td>
<td>16</td>
</tr>
<tr>
<td>Traditional Schools</td>
<td>Sex</td>
<td>N</td>
<td>%</td>
<td>Educational Degree Level</td>
<td>Certification</td>
</tr>
<tr>
<td>---------------------</td>
<td>-----</td>
<td>----</td>
<td>----</td>
<td>--------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BA (%)</td>
<td>MA (%)</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>2</td>
<td>9.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>21</td>
<td>91.0</td>
<td>86</td>
<td>14</td>
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<tr>
<td>9</td>
<td>M</td>
<td>2</td>
<td>7.0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>28</td>
<td>93.0</td>
<td>79</td>
<td>21</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>2</td>
<td>4.0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>44</td>
<td>96.0</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>6</td>
<td>16.0</td>
<td>83</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>31</td>
<td>84.0</td>
<td>97</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
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<td>5.0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>36</td>
<td>95.0</td>
<td>83</td>
<td>17</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>6</td>
<td>10.0</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>52</td>
<td>90.0</td>
<td>87</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>3</td>
<td>9.0</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>32</td>
<td>91.0</td>
<td>84</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
<td>23</td>
<td>8.6</td>
<td>56</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>244</td>
<td>91.4</td>
<td>82</td>
<td>18</td>
</tr>
</tbody>
</table>
Tables V and VI suggest that the educational level of the two groups of female teachers was similar, with an average of 84 percent of the open-area group holding a bachelor's degree compared to an average of 82 percent for the traditionally-constructed group. Accordingly, the average figures for the master's degree were 16 percent for the open-area group and 18 percent for the traditionally-constructed group. The data revealed that an average of 67 percent of the male teachers in the open-area schools possessed bachelor's degrees, with an average of 33 percent holding master's degrees. Respective figures for the males in the traditional schools were 56 percent and 44 percent. In the open-area schools, all of the male teachers had permanent certification compared to an average of 96 percent in the traditionally-constructed schools. In the open-area schools, an average of 86 percent of the female teachers had permanent certificates, while an average of 91 percent of the traditionally-constructed school female teachers held permanent certificates. The data clearly indicated that the majority of teachers in the schools studied were female. Males comprised 2.2 percent of the open-area school faculties and 8.6 percent of the traditionally-constructed school faculties.

Tables VII and VIII depict the age and experience of the faculties of the schools involved in the study.
## TABLE VII

YEARS OF EXPERIENCE AND AGE OF FACULTIES IN OPEN-AREA SCHOOLS

<table>
<thead>
<tr>
<th>Open-Area Schools</th>
<th>Sex</th>
<th>N</th>
<th>%</th>
<th>Years Experience</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>0-5 (%)</td>
</tr>
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<td>1</td>
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</tr>
<tr>
<td></td>
<td>F</td>
<td>14</td>
<td>93.0</td>
<td>57</td>
</tr>
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<td>M</td>
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<td>0.0</td>
<td>0</td>
</tr>
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<td></td>
<td>F</td>
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<td>100.0</td>
<td>56</td>
</tr>
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<td>F</td>
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<td>4</td>
<td>M</td>
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</tr>
<tr>
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<td>F</td>
<td>17</td>
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<td>71</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>1</td>
<td>4.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>96.0</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
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<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>23</td>
<td>100.0</td>
<td>57</td>
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<tr>
<td>7</td>
<td>M</td>
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<td></td>
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<tr>
<td>Total</td>
<td>M</td>
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<td>2.2</td>
<td>67</td>
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<td></td>
<td>F</td>
<td>142</td>
<td>97.8</td>
<td>60</td>
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</table>
TABLE VII--Continued

<table>
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<tr>
<th>Age</th>
<th>26-35 (%)</th>
<th>36-45 (%)</th>
<th>46-55 (%)</th>
<th>56-65 (%)</th>
<th>65 and Over (%)</th>
</tr>
</thead>
<tbody>
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<td>Under 26 (%)</td>
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<td>21</td>
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<tr>
<td>0</td>
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</tr>
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<td>33</td>
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<td>0</td>
</tr>
<tr>
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<td>20</td>
<td>25</td>
<td>10</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
### TABLE VIII
YEARS OF EXPERIENCE AND AGE OF FACULTIES IN TRADITIONAL SCHOOLS

<table>
<thead>
<tr>
<th>Traditional Schools</th>
<th>Sex</th>
<th>N</th>
<th>%</th>
<th>Years Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-5 (%)</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>2</td>
<td>9.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>21</td>
<td>91.0</td>
<td>48</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
<td>2</td>
<td>7.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>28</td>
<td>93.0</td>
<td>25</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>2</td>
<td>4.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>44</td>
<td>96.0</td>
<td>43</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>6</td>
<td>16.0</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>31</td>
<td>84.0</td>
<td>74</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>2</td>
<td>5.0</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>36</td>
<td>95.0</td>
<td>50</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>6</td>
<td>10.0</td>
<td>17</td>
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<tr>
<td></td>
<td>F</td>
<td>52</td>
<td>90.0</td>
<td>56</td>
</tr>
<tr>
<td>14</td>
<td>M</td>
<td>3</td>
<td>9.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>32</td>
<td>91.0</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
<td>23</td>
<td>8.6</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>244</td>
<td>91.4</td>
<td>49</td>
</tr>
<tr>
<td>Under 26 (%)</td>
<td>26-35 (%)</td>
<td>36-45 (%)</td>
<td>46-55 (%)</td>
<td>56-65 (%)</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>0</td>
<td>50</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>33</td>
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<td>10</td>
<td>10</td>
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<td>50</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
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<td>43</td>
<td>14</td>
<td>7</td>
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<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>0</td>
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<td>29</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>33</td>
<td>17</td>
<td>17</td>
<td>33</td>
<td>0</td>
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<tr>
<td>58</td>
<td>23</td>
<td>10</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>0</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>36</td>
<td>22</td>
<td>25</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>0</td>
<td>17</td>
<td>50</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>40</td>
<td>23</td>
<td>17</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>0</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td>25</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>35</td>
<td>22</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>34</td>
<td>29</td>
<td>22</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>
Tables VII and VIII suggest that the two groups of schools studied had similar female teacher characteristics in terms of years of experience and distribution of age. In the open-area schools, 80 percent of the female teachers had 0-10 years of experience with a corresponding figure of 75 percent for the traditionally-constructed schools. In the open-area schools, 45 percent of the female teachers were in the 26-45 category, while in the traditionally-constructed schools, 51 percent were in the 26-45 age range. Data for the male teachers, who comprised a low percentage of the total faculty, were not so similar. The open-area school data for males indicated 100 percent had 0-10 years of experience, while only 34 percent of the males in the traditionally-constructed schools had similar experience. In the open-area schools, 67 percent of the male teachers were in the 26-45 age group with 57 percent being a corresponding figure for the traditionally-constructed schools.

**Classroom Teacher Allocation Ratio**

This ratio indicates the number of teachers allocated to each elementary campus for a given number of students. Only regular classroom teachers are considered in determining this ratio. Librarians, nurses, counselors, administrators, and other support personnel are not included in the computation.
Classroom Teacher Unit to Pupil Ratio

As indicated in the previous section, each school is allocated teachers on a ratio basis. The management team of the school then organizes and groups students for instruction. The resulting classroom teacher unit to pupil ratio was a criterion for matching the schools, since educators are much concerned about the effects of class size on pupil achievement.

Salary Expense Per Pupil

The two groups of schools were also compared for similarity in the amount of money expended for teacher salaries. This criterion used for further matching the two groups of schools is a common factor in reports of various state and federal agencies.

Table IX presents the classroom teacher allocation ratio, the resulting classroom teacher unit to pupil ratio, and the salary expense per student for each of the schools comprising the two groups of schools studied. The data in Table IX reveal that in both the open-area and traditional schools, the ratio of one teacher for each twenty-seven students prevailed, and therefore no discrepancy was found to exist in this criterion for matching. Further examination of the table indicates a variation of 0.2 in the resulting classroom teacher unit to pupil ratio, revealing that the two groups of schools were
<table>
<thead>
<tr>
<th>Schools</th>
<th>Allocation Ratio</th>
<th>Classroom Teacher Unit To Pupil Ratio</th>
<th>Salary Expense Per Pupil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open-Area Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>27:1</td>
<td>24.1:1</td>
<td>$312.00</td>
</tr>
<tr>
<td>2</td>
<td>27:1</td>
<td>27.1:1</td>
<td>294.00</td>
</tr>
<tr>
<td>3</td>
<td>27:1</td>
<td>26.4:1</td>
<td>265.00</td>
</tr>
<tr>
<td>4</td>
<td>27:1</td>
<td>25.7:1</td>
<td>247.00</td>
</tr>
<tr>
<td>5</td>
<td>27:1</td>
<td>28.8:1</td>
<td>225.00</td>
</tr>
<tr>
<td>6</td>
<td>27:1</td>
<td>26.6:1</td>
<td>283.00</td>
</tr>
<tr>
<td>7</td>
<td>27:1</td>
<td>28.8:1</td>
<td>254.00</td>
</tr>
<tr>
<td>Total</td>
<td>27:1</td>
<td>26.8:1</td>
<td>$268.00</td>
</tr>
<tr>
<td>Traditional Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>27:1</td>
<td>28.6:1</td>
<td>$219.00</td>
</tr>
<tr>
<td>9</td>
<td>27:1</td>
<td>23.6:1</td>
<td>288.00</td>
</tr>
<tr>
<td>10</td>
<td>27:1</td>
<td>28.6:1</td>
<td>290.00</td>
</tr>
<tr>
<td>11</td>
<td>27:1</td>
<td>28.0:1</td>
<td>224.00</td>
</tr>
<tr>
<td>12</td>
<td>27:1</td>
<td>24.5:1</td>
<td>271.00</td>
</tr>
<tr>
<td>13</td>
<td>27:1</td>
<td>26.3:1</td>
<td>234.00</td>
</tr>
<tr>
<td>14</td>
<td>27:1</td>
<td>26.6:1</td>
<td>257.00</td>
</tr>
<tr>
<td>Total</td>
<td>27:1</td>
<td>26.6:1</td>
<td>$255.00</td>
</tr>
</tbody>
</table>

*Source: Dallas Independent School District ESEA Title I Comparability Report (1973).*
comparable in terms of mean class size in grades one, two, and three. Amount of money expended for teacher salaries was found to be only $13.00 per pupil more in the open-area schools.

Analysis of the data for matching the open-area schools with the traditional schools revealed that the two groups of schools were comparable. Both groups of schools subscribed to the District's basic instructional program and utilized the uniform allocation of textbooks, aids, materials, and supplies. The ethnicity of the faculties and student bodies, as revealed in Tables II and IV, was similar. Also, the two groups of schools were found to have children from families with comparable environmental backgrounds. Both groups of schools had faculties with closely-matched characteristics. The teacher allocation ratio was the same for both groups of schools, with the resulting CTU-Pupil ratio varying by only 0.2. Educational degree level, certification, experience, age, and salary expenditure per pupil were found to be closely matched. Male teachers in the two groups of schools did have varying characteristics, but this was offset by the fact that only 8.6 percent of the teachers in the traditionally-constructed schools and only 2.2 percent in the open-area schools were males.
Analysis of the Tests of the Hypotheses

Achievement Scores

It was hypothesized that there would be no significant differences in the mean achievement scores in reading, language, and mathematics of students attending open-area elementary schools as compared to similar students attending traditionally-constructed elementary schools after one, two, and three years of instruction.

Table X displays the results of the t-test for independent samples on achievement in reading, language, and mathematics after one year of instruction. The data displayed suggest that there were no significant differences between the achievement of students in open-area elementary schools versus those in traditionally-constructed elementary schools.

**TABLE X**

**ACHIEVEMENT LEVELS AFTER ONE YEAR OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Open-Area</th>
<th>Traditional</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
<td>$n$</td>
<td>$\bar{X}$</td>
</tr>
<tr>
<td>Reading</td>
<td>58.71</td>
<td>10.21</td>
<td>7</td>
<td>65.43</td>
</tr>
<tr>
<td>Language</td>
<td>37.14</td>
<td>7.38</td>
<td>7</td>
<td>48.36</td>
</tr>
<tr>
<td>Mathematics</td>
<td>21.37</td>
<td>6.04</td>
<td>7</td>
<td>25.40</td>
</tr>
</tbody>
</table>
Table X suggests that none of the test statistics yielded significant results; that is, none of the observed sample differences were sufficiently large to conclude that they represented true differences in population means.

Table XI displays the results of the $t$-test for independent samples on achievement in reading, language, and mathematics after two years of instruction. The data displayed suggest that there were no significant differences between the achievement of students in open-area elementary schools versus those in traditionally-constructed elementary schools.

**TABLE XI**

ACHIEVEMENT LEVELS AFTER TWO YEARS OF INSTRUCTION

<table>
<thead>
<tr>
<th>Subject</th>
<th>Open-Area</th>
<th></th>
<th>Traditional</th>
<th></th>
<th>$t$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>s</td>
<td>n</td>
<td>$\bar{x}$</td>
<td>s</td>
<td>n</td>
</tr>
<tr>
<td>Reading</td>
<td>23.71</td>
<td>3.64</td>
<td>7</td>
<td>26.71</td>
<td>4.64</td>
<td>7</td>
</tr>
<tr>
<td>Language</td>
<td>21.57</td>
<td>5.35</td>
<td>7</td>
<td>25.86</td>
<td>5.01</td>
<td>7</td>
</tr>
<tr>
<td>Mathematics</td>
<td>30.14</td>
<td>4.30</td>
<td>7</td>
<td>32.17</td>
<td>4.54</td>
<td>7</td>
</tr>
</tbody>
</table>

Table XI suggests that none of the test statistics yielded significant results; that is, none of the observed sample differences were sufficiently large to conclude,
with a significant degree of confidence, that they represented true differences in population means.

Table XII displays the results of the t-test for independent samples on achievement in reading, language, and mathematics after three years of instruction. The data displayed suggest that there were no significant differences between the achievement of students in open-area elementary schools versus those in traditionally-constructed elementary schools.

**TABLE XII**

**ACHIEVEMENT LEVELS AFTER THREE YEARS OF INSTRUCTION**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Open-Area</th>
<th>Traditional</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
<td>$n$</td>
<td>$\bar{X}$</td>
</tr>
<tr>
<td>Reading</td>
<td>23.57</td>
<td>2.57</td>
<td>7</td>
<td>26.43</td>
</tr>
<tr>
<td>Language</td>
<td>23.57</td>
<td>3.36</td>
<td>7</td>
<td>24.43</td>
</tr>
<tr>
<td>Mathematics</td>
<td>28.92</td>
<td>4.46</td>
<td>7</td>
<td>28.75</td>
</tr>
</tbody>
</table>

Table XII suggests that none of the test statistics yielded significant results; that is, none of the observed sample differences were large enough to conclude that they represented true differences in population means.

In summary, the data displayed in Tables X, XI, and XII suggest that there were no significant differences in
student achievement in reading, language, and mathematics in open-area elementary schools versus traditionally-constructed elementary schools after one, two, and three years of instruction. Therefore, the respective null hypotheses were retained.

**Individualization of Instruction**

It was hypothesized that there would be a significantly greater degree of individualization of instruction in the open-area elementary schools than in the traditionally-constructed elementary schools. In operationalizing individualization, five distinct dimensions were identified. Those five dimensions were differential assignments, interclass groupings, variety of materials, pupil autonomy, and tutoring. Each of the aforementioned dimensions was tested. The data displayed in Table XIII suggest that there was a significant difference on four of the five dimensions of individualization of instruction in open-area elementary schools versus that found in traditionally-constructed elementary schools. The data in Table XIII suggest that the extent of individualization of instruction differed significantly on four of the five dimensions in open-area elementary schools versus traditionally-constructed elementary schools. The four dimensions found to be significant were differential assignments, interclass groupings, use of a variety of materials, and tutoring.
TABLE XIII
EXTENT OF INDIVIDUALIZATION OF INSTRUCTION

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Open-Area</th>
<th></th>
<th></th>
<th>Traditional</th>
<th></th>
<th></th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>s</td>
<td>n</td>
<td>X</td>
<td>s</td>
<td>n</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Assignments</td>
<td>18.83</td>
<td>1.07</td>
<td>6</td>
<td>17.15</td>
<td>0.88</td>
<td>6</td>
<td>*3.44</td>
<td>10</td>
</tr>
<tr>
<td>Groupings</td>
<td>20.02</td>
<td>1.97</td>
<td>6</td>
<td>18.43</td>
<td>1.62</td>
<td>6</td>
<td>*2.21</td>
<td>10</td>
</tr>
<tr>
<td>Materials</td>
<td>18.87</td>
<td>1.87</td>
<td>6</td>
<td>17.13</td>
<td>1.74</td>
<td>6</td>
<td>*2.41</td>
<td>10</td>
</tr>
<tr>
<td>Autonomy</td>
<td>17.05</td>
<td>1.15</td>
<td>6</td>
<td>17.18</td>
<td>1.10</td>
<td>6</td>
<td>0.18</td>
<td>10</td>
</tr>
<tr>
<td>Tutoring</td>
<td>14.07</td>
<td>1.41</td>
<td>6</td>
<td>12.58</td>
<td>0.81</td>
<td>6</td>
<td>*3.24</td>
<td>10</td>
</tr>
</tbody>
</table>

*p .05.

There was a significantly greater degree of individualization of instruction in the open-area elementary schools than in the traditionally-constructed elementary schools.

Actions Toward Schools

It was hypothesized that students attending open-area elementary schools would evidence a significantly greater number of positive actions toward school than would similar students of traditionally-constructed elementary schools, as indicated by a higher rate of daily attendance, fewer acts of vandalism, and fewer suspensions from school.

Table XIV displays the results of the t-test for independent samples on rate of daily attendance, number
of acts of vandalism, and number of suspensions from school. The data displayed suggest that there was no significant difference in rate of daily attendance for the two groups of schools. Significant differences were found to exist in the number of acts of vandalism and the number of suspensions from school in open-area elementary schools versus traditionally-constructed schools.

TABLE XIV

ACTIONS TOWARD SCHOOL

<table>
<thead>
<tr>
<th>Action</th>
<th>Open-Area</th>
<th></th>
<th>Traditional</th>
<th></th>
<th></th>
<th></th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{X}$</td>
<td>$s$</td>
<td>$n$</td>
<td>$\bar{X}$</td>
<td>$s$</td>
<td>$n$</td>
<td>$t$</td>
</tr>
<tr>
<td>Attendance</td>
<td>89.24</td>
<td>2.88</td>
<td>7</td>
<td>90.36</td>
<td>3.27</td>
<td>7</td>
<td>-0.068</td>
</tr>
<tr>
<td>Vandalism</td>
<td>2.57</td>
<td>1.64</td>
<td>7</td>
<td>6.14</td>
<td>3.60</td>
<td>7</td>
<td>*-2.400</td>
</tr>
<tr>
<td>Suspensions</td>
<td>0.86</td>
<td>1.46</td>
<td>7</td>
<td>5.71</td>
<td>5.02</td>
<td>7</td>
<td>*-2.450</td>
</tr>
</tbody>
</table>

*p *0.05.

Table XIV suggests that the test statistics revealed no significant difference in daily rate of attendance in open-area elementary schools versus traditionally-constructed elementary schools. The results obtained from the analysis of the tests relative to the number of acts of vandalism and number of suspensions from school suggested that open-area elementary schools experienced
a significantly lower number of acts of vandalism and number of suspensions from school than did traditionally-constructed elementary schools. In summary, the data displayed in Table XIV suggest that the null hypothesis should be retained in the case of the daily rate of attendance and rejected relative to the number of acts of vandalism and number of suspensions from school.

**Organizational Climate**

It was hypothesized that the organizational climate of open-area elementary schools would be more open than that existing in traditionally-constructed elementary schools. The data displayed in Table XV suggest that there was no significant difference in the degree of openness in the open-area elementary schools versus that found in traditionally-constructed elementary schools.

**TABLE XV**

**ORGANIZATIONAL CLIMATE**

<table>
<thead>
<tr>
<th>Climate</th>
<th>Open-Area</th>
<th>Traditional</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\bar{x}$</td>
<td>s</td>
<td>n</td>
<td>$\bar{x}$</td>
</tr>
<tr>
<td>Openness</td>
<td>35.57</td>
<td>11.72</td>
<td>7</td>
<td>28.00</td>
</tr>
</tbody>
</table>

Table XV suggests that the degree of openness did not differ significantly in open-area elementary schools versus
that found in traditionally-constructed elementary schools. Therefore, the null hypothesis was accepted.

Table XVI displays in summary form the hypothesis tested and indicates the results of the \( t \)-tests for independent samples.

**TABLE XVI**

**SUMMARY OF RESULTS**

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement--1 year</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Achievement--2 years</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Achievement--3 years</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Individualization of Instruction</td>
<td><em>Significant difference (greater degree of individualization of instruction in open-area schools)</em></td>
</tr>
<tr>
<td>Attendance</td>
<td>No significant difference</td>
</tr>
<tr>
<td>Vandalism</td>
<td><em>Significant difference (fewer acts of vandalism in open-area schools)</em></td>
</tr>
<tr>
<td>Suspensions</td>
<td><em>Significant difference (fewer suspensions from school in open-area schools)</em></td>
</tr>
<tr>
<td>Organizational climate</td>
<td>No significant difference</td>
</tr>
<tr>
<td></td>
<td>*( p \leq .05 ).</td>
</tr>
</tbody>
</table>

Table XVI suggests that significant differences were found for the hypotheses pertaining to the degree of individualization of instruction, number of acts of vandalism, and number of suspensions from school. The
open-area elementary schools evidenced a greater degree of individualization of instruction, fewer acts of vandalism, and fewer suspensions from school than did the traditionally-constructed elementary schools. No significant differences were found for the remainder of the hypotheses.
CHAPTER BIBLIOGRAPHY


CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND
RECOMMENDATIONS

Summary

During the past decades, the nation's educational leaders faced many challenges. The student population increase coupled with a rapidly changing, highly technical society prompted many changes in education. School architecture has been the focal point of much of this change. This study was designed to assess and compare selected student and environmental variables in open-area and traditionally-constructed elementary schools. Seven open-area elementary schools were matched with seven traditionally-constructed elementary schools.

Hypotheses were formulated to carry out the following four purposes of the study:

1. To determine the differences between the achievement test scores in reading, language, and mathematics of students attending open-area elementary schools and scores of similar students attending traditionally-constructed elementary schools as measured by the California Achievement Test and the Comprehensive
Test of Basic Skills administered in grades one, two, and three.

2. To determine if there was greater individualization of instruction in open-area elementary schools as measured by the Individualization of Instruction Inventory.

3. To determine if students attending open-area elementary schools evidenced a greater number of positive actions toward school as indicated by attendance, number of acts of vandalism, and number of suspensions from school as revealed in official records of the school district.

4. To determine if the organizational climate of the open-area elementary schools was significantly different as evidenced by Halpin and Croft's Organizational Climate Description Questionnaire.

The t-test for independent samples was used to test the hypotheses. Open-area elementary schools were found to experience a greater degree of individualization of instruction and fewer number of acts of vandalism and suspensions from school. No significant differences were found to exist for the remainder of the hypotheses.
Findings

Statistical analysis of the data used to test the hypotheses resulted in the following findings:

1. There was no significant difference in the mean achievement scores of students attending open-area elementary schools as compared to similar students attending traditionally-constructed elementary schools at the end of one year of instruction in reading, language, and mathematics.

2. There was no significant difference in the mean achievement scores of students attending open-area elementary schools as compared to similar students attending traditionally-constructed elementary schools at the end of two years of instruction in reading, language, and mathematics.

3. There was no significant difference in the mean achievement scores of students attending open-area elementary schools as compared to similar students attending traditionally-constructed elementary schools at the end of three years of instruction in reading, language, and mathematics.

4. There was a significant difference in the degree of individualization of instruction in open-area
elementary schools as compared to that found in traditionally-constructed elementary schools.

5. There was no significant difference between the rate of daily attendance for the students of the open-area and the traditionally-constructed elementary schools.

6. The number of acts of vandalism was significantly lower in the open-area elementary schools than in the traditionally-constructed elementary schools.

7. The number of suspensions from school was significantly lower in the open-area elementary schools than in the traditionally-constructed elementary schools.

8. There was no significant difference in the organizational climate of the open-area schools compared to the organizational climate of the traditionally-constructed elementary schools.

Conclusions

Based upon the findings of the study and the review of the literature, the following conclusions may be drawn:

1. It appears that one type of school building construction is not superior to another in terms of
producing significant differences in mean achievement test scores.

2. It appears that the open-area facility more adequately promotes the deployment of pupils into special instructional sub-groups within the class setting than does the traditionally-constructed elementary facility.

3. It appears that the open-area facility more adequately encourages the use of a variety of instructional materials and types of equipment than does the traditionally-constructed facility.

4. It appears that in the open-area school more pupils receive differentiated lesson assignments tailored to their unique educational needs than do students in traditionally-constructed elementary schools.

5. It appears that the open-area facility does not result in any greater use of procedures that give students more freedom and responsibility for learning than does the traditionally-constructed elementary facility.

6. It appears that the open-area school more adequately fosters the use of tutorial techniques of various kinds within the class setting than does the traditionally-constructed elementary school.
7. It appears that the open-area school is designed to better accommodate the concepts of individualization of instruction, flexible scheduling, non-grading, multi-aging, team teaching, and other less traditional approaches to teaching and learning than is the traditionally-constructed elementary school.

8. It appears that the uniqueness of the open-area school, coupled with its interior and exterior attractiveness and lesser amounts of exposed exterior glass, results in less physical damage to the facility, as is evident by fewer acts of vandalism occurring in open-area schools.

9. It appears that the traditionally-constructed school, with its constraints of space, higher degree of confinement, and tendency to accentuate noise and movement, experiences a greater number of serious discipline problems as is evident by a greater number of suspensions from school.

10. It appears that the type of facility does not guarantee a more desirable organizational climate.

11. It appears that the trend in school construction across the nation is to build new facilities featuring the open-space concept that will accommodate variations in the organization for and delivery of the curriculum.
12. It appears that the roles of the teacher and the principal in an open-area elementary school are somewhat different from the same positions in a traditional elementary school. This difference suggests an urgent need for extensive pre-service and in-service staff development.

Recommendations

Considering the findings of the study and the review of the literature, the following recommendations are made for administrative consideration or further research related to open-area elementary schools:

1. Architectural form should be based on educational function. Facility planning should include the development of extensive educational specifications to ascertain that the proposed new or remodeled facility will enhance the accomplishment of established educational objectives.

2. Administrators and teachers should be carefully selected and possess specific qualifications for an open-area elementary school position.

3. Well developed and carefully planned staff development programs, featuring the competencies of open-area teachers and administrators who are considered to be successful, should be implemented to prepare teachers and
administrators for the greatly different role to be encountered in the open-area school.

4. The leadership style of all school administrators should be explored and changes in style encouraged where deemed necessary to improve the organizational climate of the school.

5. Additional longitudinal research pertaining to the academic achievement of students in open-area schools is needed.

6. Additional research should focus upon the behavioral characteristics of students who have had experience in open-area schools.

7. Additional research is needed to establish the concomitants of individualized instruction and the capability of the open-area school to facilitate the process.

8. Additional research related to program operation and initial cost should be conducted assessing the cost effectiveness of open-area facilities.

Due to a nationwide effort to improve the educational product, extensive change has occurred in school architecture, and as a result a majority of the nation's schools are now being constructed as open-area facilities. Not many comprehensive studies exist, but those that have been made generally indicate that the type of construction is
not likely to have any real effect on pupil achievement. However, the open-area building is highly flexible and readily accommodates variations in educational programming. Based on this fact and other information cited in this study, it is recommended that school districts continue to construct open-area elementary schools. More knowledge is needed and hopefully more studies on the topic will be made in the future.
APPENDIX A

LETTER OF PERMISSION
May 14, 1973

Mr. Joe M. Pitts
Dallas Independent School District
3700 Ross Avenue
Dallas, Texas 75204

Dear Mr. Pitts:

Re: Your letter dated May 11th.

You may have our permission to use, in the English language only, the Organizational Climate Description Questionnaire from THEORY AND RESEARCH IN ADMINISTRATION by Andrew W. Halpin, subject to the following limitations:

Permission is granted for usage of the material in the manner and for the purpose as specified in your letter. Note: If your doctoral dissertation is published (other than University Microfilms) it is necessary to reapply for permission;

Permission is granted for a fee of $35.00. This fee is payable upon signing.

Full credit must be given on every copy reproduced as follows:


If you are in agreement, please sign both copies of this letter in the space provided below and return one copy and your remittance to this department.

Thank you.

Sincerely,

MACMILLAN PUBLISHING CO., INC.

(Mrs.) Agnes Moran
Permissions Manager

AGREED TO:

Joe M. Pitts
Appendix B

Organization Climate Description Questionnaire

Name of School
Type of Facility:
____ Open-Area Construction
____ Traditional Construction

Choose one of these categories to tell how you think each statement applies to your school. Write its number in the space to the left of the statement number:

1. Rarely Occurs
2. Sometimes Occurs
3. Often Occurs
4. Very Frequently Occurs

1. Teachers' closest friends are other faculty members at this school.
2. The mannerisms of teachers at this school are annoying.
3. Teachers spend time after school with students who have individual problems.
4. Instructions for the operation of teaching aids are available.
5. Teachers invite other faculty members to visit them at home.
6. There is a minority group of teachers who always oppose the majority.
7. Extra books are available for classroom use.
8. Sufficient time is given to preparing administrative reports.
9. Teachers exert group pressure on nonconforming faculty members.
10. Teachers know the family background of other faculty members.
11. In faculty meetings, there is the feeling of "let's get things done."
12. Administrative paper work is burdensome at this school.
13. Teachers talk about their personal life to other faculty members.
14. Teachers seek special favors from the principal.
15. School supplies are readily available for use in classwork.
16. Student progress reports require too much work.
17. Teachers have fun socializing together during school time.
18. Most of the teachers here accept the faults of their colleagues.
19. Teachers interrupt other faculty members who are talking in staff meetings.
20. Teachers have too many committee requirements.
21. There is considerable laughter when teachers gather informally.
22. Teachers ask nonsensical questions in faculty meetings.
23. Custodial service is available when needed.
24. Routine duties interfere with the job of teaching.
25. Teachers prepare administrative reports by themselves.
26. Teachers ramble when they talk in faculty meetings.
27. Teachers at this school show much school spirit.
28. The principal goes out of his way to help teachers.
29. The principal helps teachers solve personal problems.
30. Teachers at this school stay by themselves.
31. The teachers accomplish their work with great vim, vigor, and pleasure.
32. The principal sets an example by working hard himself.
33. The principal does personal favors for teachers.
34. Teachers eat lunch by themselves in their own classrooms.
35. The morale of the teachers is high.
36. The principal uses constructive criticism.
37. The principal stays after school to help teachers finish their work.
38. Teachers socialize together in small groups.
39. The principal makes all class-scheduling decisions.
40. Teachers are contacted by the principal each day.
41. The principal is well prepared when he speaks at school functions.
42. The principal helps staff members settle minor differences.
43. The principal schedules the work for the teachers.
44. Teachers leave the grounds during the school day.
45. The principal criticizes a specific act rather than a staff member.
46. Teachers help select which courses will be taught.
47. The principal corrects teachers' mistakes.
48. The principal talks a great deal.
49. The principal explains his reasons for criticism to teachers.
50. The principal tries to get better salaries for teachers.
51. Extra duty for teachers is posted conspicuously.
52. The rules set by the principal are never questioned.
53. The principal looks out for the personal welfare of teachers.
54. School secretarial service is available for teachers' use.
55. The principal runs the faculty meeting like a business conference.
56. The principal is in the building before teachers arrive.
57. Teachers work together preparing administrative reports.
58. Faculty meetings are organized according to a tight agenda.
59. Faculty meetings are mainly principal-report meetings.
60. The principal tells teachers of new ideas he has run across.
61. Teachers talk about leaving the school system.
62. The principal checks the subject-matter ability of teachers.
63. The principal is easy to understand.
64. Teachers are informed of the results of a supervisor's visit.
65. Grading practices are standardized at this school.
66. The principal insures that teachers work to their full capacity.
67. Teachers leave the building as soon as possible at day's end.
68. The principal clarifies wrong ideas a teacher may have.
69. Schedule changes are posted conspicuously at this school.
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## APPENDIX C

### INDIVIDUALIZATION OF INSTRUCTION

### INVENTORY

#### DIRECTIONS

This inventory is intended to give a descriptive picture of your classroom situation. Each of the twenty-five items below describes an aspect of instruction. A five-point scale follows each one. Circle the number on each scale that best describes your classroom situation.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Pupils do advanced level or enrichment work</td>
<td>Nearly half of the pupils do obviously advanced level or enrichment work.</td>
<td>Several pupils do advanced level or enrichment work.</td>
<td>No pupil does advanced level or enrichment work.</td>
</tr>
<tr>
<td>2.</td>
<td>The arrangement of furniture promotes flexible groupings.</td>
<td>Desks and chairs are arranged in varying patterns for a variety of types of work.</td>
<td>At least one special arrangement is provided for group work.</td>
<td>All desks and chairs are arranged in rank-and-file or other uniform pattern.</td>
</tr>
<tr>
<td>3.</td>
<td>Materials used are at different levels of difficulty.</td>
<td>All pupils work with materials that reflect different levels of difficulty.</td>
<td>Nearly half the pupils use materials reflecting several different levels of difficulty.</td>
<td>All pupils use the same material.</td>
</tr>
<tr>
<td>4.</td>
<td>Pupils lead the class or groups within the class</td>
<td>Teacher arranges for one or more pupils to lead the class or a group for a substantial period of time.</td>
<td>One or more pupils are permitted to lead the class or a group but only for brief moments.</td>
<td>No pupil is permitted to lead the class or a group.</td>
</tr>
<tr>
<td>5.</td>
<td>A variety of assignments is made to individuals and small groups.</td>
<td>Identical assignments are given only to small groups.</td>
<td>Identical assignments are given to all of the class only occasionally.</td>
<td>All pupils are given identical assignments most of the time.</td>
</tr>
<tr>
<td>6.</td>
<td>Pupils work independently in intra-class groups.</td>
<td>Pupils work in small groups with little direction for prolonged periods of time.</td>
<td>Most pupils work independently in small groups for short periods of time.</td>
<td>Pupils work in small or large groups under the direction of the teacher at all times.</td>
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<tr>
<td>7.</td>
<td>A variety of reference material is in use by both the teacher and the pupil.</td>
<td>5</td>
<td>Encyclopedias, dictionaries, atlases, supplementary texts, etc., are used but in limited ways.</td>
<td>2</td>
</tr>
<tr>
<td>8.</td>
<td>Pupils help each other with their work.</td>
<td>5</td>
<td>Pupils help each other in constructive ways.</td>
<td>2</td>
</tr>
<tr>
<td>9.</td>
<td>Routine duties are being shared by pupils in a planned fashion.</td>
<td>5</td>
<td>Systematic procedures are employed to assure each student an opportunity to assume his share of responsibility.</td>
<td>2</td>
</tr>
<tr>
<td>10.</td>
<td>There is freedom of movement within the class.</td>
<td>5</td>
<td>Pupils are permitted to change work stations as needs arise.</td>
<td>2</td>
</tr>
<tr>
<td>11.</td>
<td>A wide variety of teacher-made materials such as work sheets, games, transparencies, charts, and other aids is in use.</td>
<td>5</td>
<td>These materials are used frequently and in great variety.</td>
<td>2</td>
</tr>
<tr>
<td>12.</td>
<td>Pupils are permitted to help in planning learning activities.</td>
<td>4</td>
<td>All pupils are actively involved in short- and long-range planning.</td>
<td>2</td>
</tr>
<tr>
<td>13.</td>
<td>Pupil participation is differentiated so as to be active, challenging, and purposeful to each individual.</td>
<td>5</td>
<td>All pupils participate actively with purposes that challenge their different abilities.</td>
<td>2</td>
</tr>
<tr>
<td>14.</td>
<td>Intra-class groups vary in size and number to reflect pupil needs.</td>
<td>5</td>
<td>Groups range from one person to as much as half the class.</td>
<td>2</td>
</tr>
<tr>
<td>15.</td>
<td>A variety of newspapers, pamphlets, and magazines is in use.</td>
<td>4</td>
<td>Pupils use a variety of newspapers and magazines as a regular part of their work.</td>
<td>2</td>
</tr>
</tbody>
</table>

54 Encyclopedias, dictionaries, atlases, supplementary texts, etc., are used but in limited ways.

54 Pupils help each other in constructive ways.

54 Systematic procedures are employed to assure each student an opportunity to assume his share of responsibility.

54 Pupils are permitted to change work stations as needs arise.

54 These materials are used frequently and in great variety.

54 All pupils are actively involved in short- and long-range planning.

54 All pupils participate actively with purposes that challenge their different abilities.

54 Groups range from one person to as much as half the class.

54 Pupils use a variety of newspapers and magazines as a regular part of their work.

54 Pupils allow little or no opportunity to help with planning.

54 Students have opportunities to share in assuming routine responsibilities, but this is not systematic but assured.

54 Teacher suggests or approves all changes that are made in work stations.

54 These materials are used periodically but only in limited variety.

54 Pupils are permitted to offer suggestions for teacher planning.

54 Pupils participate actively with purposes that challenge most.

54 Groups vary in size, but only two or three groups are employed.

54 Pupils use few newspapers and magazines occasionally.

108 Little or no reference material is being used.

1 Pupils help each other on occasion.

1 Pupils attend strictly to their own individual tasks at all times.

1 There is little or no pupil sharing of routine duties.

1 Pupils remain at work stations for nearly all activities.

1 These materials are used sparingly or not at all.

1 Pupils are permitted little or no opportunity to help with planning.

1 Pupils participate passively with purposes that challenge only a few.

1 No intra-class grouping is employed.

1 Pupils make little use of any newspapers or magazines.
16. Pupils find and correct their own errors.

17. Pupils reflect an interest in the class work.

18. Intra-class groupings are flexible and task-oriented.

19. A variety of library books is in use.

20. Pupils are held responsible for their own actions.

21. Regular teachers work with individual pupils.

22. Special teachers work with individual pupils.

23. All pupils serve as tutors of others.
24. Resource persons are used to assist individual pupils.

25. Tutorial arrangements are planned and coordinated.

5 A variety of resource people serve as tutors on a daily basis.

4 A few resource people serve as tutors on a fairly regular basis.

3 Most tutorial assignments are preplanned and coordinated, but some last-minute arrangements are observed.

2 Tutorial assignments are coordinated primarily by tutors themselves; preplanning is not clearly evident.

1 A few resource people serve as tutors on an occasional basis.
APPENDIX D

INSTRUMENTS

California Achievement Tests (CAT) -- 1970 Edition

Purpose: The CAT, 1970 edition, was designed for the measurement, evaluation, and analysis of school achievement. The emphasis is upon content and objectives in the basic curricular areas of reading, mathematics, and language. The intended measurement is one of performance in these curricular areas. The CAT is designed to measure the skill with which the student performs curricular tasks which are basic to learning progress.

Grades Given: One and two, Level 1, Forms A & B.

Description:

Reading

Vocabulary 30 minutes
Comprehension 16 minutes

Mathematics

Computation 14 minutes
Concepts and Problem 17 minutes
Total Time: One hour and 54 minutes.
Company: CTB. McGraw-Hill.

Comprehensive Tests of Basic Skills (CTBS)

Purpose: Measure the extent to which students have acquired skills that are required for effective use of language and numbers in everyday living and for further academic study.

Items were written by classroom teachers in conjunction with curriculum and test specialists.

Items were chosen for their content and intellectual process used.

The reading questions stress the ability to translate, to interpret, and to discover relationship.

Separate norm groups are presented for large districts and Catholic schools.

Grades Given: Three through eight.

Description:
Level 1--Grades 2-4
Level 2--Grades 4-6
Level 3--Grades 6-8
Level 4--Grades 8-10
Reading
Test 1--Vocabulary
Test 2--Comprehension

Language
Test 3--Mechanics
Test 4--Expression
Test 5--Spelling

Arithmetic
Test 6--Computation
Test 7--Concepts
Test 8--Applications

Study Skills
Test 9--Reference Materials
Test 10--Graphic Materials


Time: One hundred seventy minutes to 184 minutes according to level of tests.
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