A COMPARISON OF THE EFFECTS OF NONGRADED, MULTI-AGE, TEAM TEACHING VS. THE MODIFIED SELF-CONTAINED CLASS-ROOM AT THE ELEMENTARY SCHOOL LEVEL

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ABSTRACT

A COMPARISON OF THE EFFECTS OF NONGRADED, MULTI-AGE, TEAM TEACHING VS. THE MODIFIED SELF-CONTAINED CLASSROOM AT THE ELEMENTARY SCHOOL LEVEL

By

James A. Burchyett

Introduction

The purpose of the study was to investigate the academic achievement of students in grades three, four and five resulting from their participation in a nongraded, multi-age, team teaching organization (NGMATT) as contrasted with the academic achievement of students at similar grade levels assigned to the self-contained classroom organization. Related purposes of the study were to evaluate the attitudes of the students' parents and teachers as a result of participation in the NGMATT program; and to contrast the performance of NGMATT students with those in the self-contained organization on tests of creativity, motivation and self-concept.

Some of the operational hypotheses proposed were concerned with a comparison of student academic achievement obtained as a result of the application of a NGMATT

plan of organization and the self-contained classroom organization. Academic areas investigated corresponding to the operational hypotheses developed were: reading, science, mathematics and social studies. In addition to comparisons in academic achievement, comparison of student performance on tests of creativity, motivation and self-concept were made.

Additional hypotheses proffered to support the related purpose of the study were concerned with the attitudes of the parents of students and their teachers resulting from participation in the project.

Sources of Data and Data Analysis

One experimental and one control school were employed in the present study. Two variables (factors of school and grade) were incorporated in an analysis of covariance design. Standardized instruments were utilized to obtain pupil achievement, creativity, motivation and self-concept data. An analysis of covariance grid was prepared for each achievement test separately and total grades assigned to each cell in the grid, thus accounting for a total of 332 experimental subjects and 203 control subjects for the three grade levels investigated, for a total N of 535 subjects.

Academic achievement data were collected in the Fall and Spring of the "study year." The design employed in the study made possible an adjustment of

initial achievement differences between the experimental and control group data. Final results were derived by an inspection of adjusted group means by employing a formula specifically for this purpose.

Conclusions

Children participating in the self-contained classroom organization excelled in mathematics at the fourth-grade level and in social studies at the fifth-grade level. In all other academic areas there was no significant difference in the achievement of students.

The findings of the present study do not appear to represent a significant trend favoring either school's academic achievement. At best, it can be stated that students attending either the experimental school or the control school can be expected to achieve academically in reading, mathematics, social studies and science as well in one as in the other.

Children in the nongraded, multi-age, team teaching organization excelled in creative thinking when compared to children in the self-contained classroom. This statement is supported by the fact that in six of twenty-one areas measured, experimental school students produced scores that were statistically significant; in addition, a pattern of superior performance was noted in the areas of verbal flexibility and verbal originality for grades three, four and five.

Self-concept test results of the third- and fourth-grade levels favored the self-contained classroom organization (control). However, the consistency of scores for children in the nongraded, multi-age, team teaching (experimental) organization across the three grades represents a more positive value. Consequently, neither organizational approach clearly excelled over the other.

Children in the nongraded, multi-age, team teaching (experimental) school exhibited a consistently significant advantage over children in the self-contained classroom (control) school in motivation at grades three and four.

Parent attitude was not found to favor either the nongraded, multi-age, team teaching or the self-contained classroom pattern as a means of conducting elementary education for pupils at grades three, four and five.

Teacher attitudes generally favored the non-graded, multi-age, team teaching concept over the self-contained classroom in Grand Blanc at the time of the study.

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For many, the designing, conducting and completion of educational research is a formidable task requiring unusual patience, determination and a spirit of eternal optimism. I consider myself no exception to these observations. Since I have been emotionally and intellectually committed to the task of completion of a dissertation over a period of some eleven years, it is most gratifying to experience the termination of such effort.

The successful completion of all dissertations is an outgrowth of the guidance, cooperation, stimulation and compassion of a number of individuals. My profound feelings of gratitude are extended to many.

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CHAPTER I

INTRODUCTION

Background and Need

Contemporary education theories and practices have spawned various approaches to the organization and instructional process of the public elementary school. Each approach reported in the literature emphasizes certain themes, which according to advocates of the particular approach, characterize its significant strength.

The most common basis for organizing instruction in the elementary school in the United States is the self-contained classroom. According to Dean,[1] over 75 per cent of the elementary schools employ only the self-contained classroom.

Those who favor the self-contained classroom claim that the one-teacher plan should be used with

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[1]Stuart A. Dean, Elementary School Administration and Organization, USOE Bulletin No. 11 HEW, 1960.

young children to assure proper correlation of curricular materials and to meet their social and emotional needs, Snyder.[2]

Those who oppose the self-contained classroom, represented by Stoddard,[3] believe that one teacher cannot offer knowledgeable and inspirational instruction in all curricular areas. Further they claim that grade-level curriculum and grade-level grouping fail to provide for individual differences among children of a given age.

The departmental organization is another widely used organizational plan at the elementary level. It usually involves the upper elementary age students (grades 4 to 6 or 4 to 8) and its proponents claim its major strength is in the provision for specialist teachers in the major curricular areas.

Between 1900 and 1930 departmentalization became a common practice in elementary schools in the United States. Otto[4] found that in 1929 some variety of departmental organization existed in 84 per cent of eight-year elementary schools and in 37 per cent of

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[2]Edith R. Snyder, ed., The Self-Contained Classroom (ASCD, 1960), p. 88.

[3]George D. Stoddard, The Dual Progress Plan (Harper, 1961), p. 225.

[4]Henry J. Otto, Current Practices in the Organization of Elementary Schools (Northwestern University Press, 1932).

six-year elementary schools. The practice declined thereafter in favor of the self-contained classroom until 1955 when a trend began toward the use of departmentalization. A survey of elementary principals by the National Education Association[5] showed that 20 per cent of the respondents reported that there had been some departmentalization in their schools in 1956. In 1961, 36 per cent of the principals reported some departmentalization and 49 per cent predicted that their schools would have some in 1966.

In many departmental programs the only observable differences from the self-contained classroom involve moving from room to room and teacher to teacher; student grouping remains unchanged and no major changes can be observed in the content or method of instruction. Rouse[6] found few differences in classroom practices in an observational study of departmentalized and nondepartmentalized programs in the elementary school. Gibb and Matala[7] and Heathers[8] have shown that elementary teachers

[5]National Education Association, The Principals Look at the Schools (NEA, 1962), p. 75.

[6]Margaret R. Rouse, "A Comparative Study of Departmentalization," Elementary School Journal, XLVII (1946).

[7]Glenadine E. Gibb and Dorothy L. Matala, "Study on the Use of Special Teachers of Science and Mathematics in Grades 5 and 6," School Science Math, LXII (1962), 565-85.

[8]Glen Heathers, Organizing Schools Through the Dual Progress Plan (Interstate, 1967), p. 228.

assigned as specialists in science, mathematics, English or social studies often had few more content or methods courses in their specialty than the average among general elementary teachers.

Authorities such as Goodlad, Anderson, Goodlad and Anderson and Brown[9] have proposed team teaching and nongraded organization as possible organizational alternatives. Nongrading refers to any approach that breaks away from conventional grade-level instruction and enables students to advance in all curricular areas at a rate commensurate with their ability.

Proponents of nongrading believe that learning effectiveness, motivation, creativity and mental health will be improved by gearing the student's advancement in the curriculum commensurate with his learning rate.

The conflicting evidence in support of the various organization patterns has resulted in a dilemma for Boards of Education and school administrators.

Although the most prevalent organizational pattern at the elementary school level is the self-contained

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[9]John I. Goodlad, "News and Comment," The Elementary School Journal (October, 1958), 1-17; Robert H. Anderson, "Team Teaching," NEA Journal (March, 1961), 52-54; John I. Goodlad and Robert H. Anderson, The Nongraded Elementary School (rev. ed.; New York: Harcourt, 1963), p. 248; Frank B. Brown, The Nongraded High School (New York: Prentice-Hall, 1963), p. 216.

classroom, an increasing level of doubt with respect to its efficacy is reflected in the literature.

It is most appropriate that comparative studies contrast the effects of the self-contained classroom with other approaches to school organization. In addition, there is a need for more research in the area of the nongraded, multi-age, team teaching arrangement as related to its general effectiveness in an elementary school setting in terms of student achievement, student attitude, teacher attitude, parent attitude and general community reaction.

Purpose of the Study

It is the purpose of the present study to compare the results of a nongraded, multi-age, team teaching arrangement with the self-contained classroom.

Specifically, the study is concerned with the academic achievement of students in grades three, four and five in the subject areas of reading, mathematics, social studies and science. The level of creative abilities of students at these same grades will be measured as well. A related purpose of the study is to evaluate the attitudes of students toward their in-school experience and the attitudes of their teachers and their parents as a result of participating in the experimental project.

The Setting

The setting for the investigation is a public school system located in Grand Blanc, Michigan.

The Grand Blanc Community School District, a modern suburban residential-industrial-agricultural area of approximately forty square miles, is situated just two miles south of the industrial city of Flint, Michigan and forty miles northwest of Detroit.

Included in the District are the city of Grand Blanc and portions of Grand Blanc, Mundy, Burton and Atlas Townships in Genesee County and Holly Township in Oakland County.

Considered one of the preferred residential areas of Genesee County, the District, with its hilly terrain, provides highly desirable living conditions within fifteen minutes commuting time of Flint's business, industrial and cultural centers.

A survey completed by school district officials in 1969 revealed the employment distribution of school district population to be approximately as follows:

Professional, Technical and Teaching	15.6%
Management and Proprietorship	18.8%
Labor - Skilled	29.5%
Clerical	11.8%
Salesmen	8.2%
Labor - Semi-Skilled	15.4%
Agricultural	0.7%

The survey further revealed that almost 76 per cent of the employed population work outside the District, primarily in the neighboring area of Flint.

Higher educational facilities in Flint, within short commuting distance, include the Genesee Area Community College, a branch of the University of Michigan, and the General Motors Institute of Technology.

The population of the Grand Blanc area increased 93 per cent from 1950 to 1960 (5,685 to 10,983) and 110 per cent from 1960 to 1970 (10,983 to 23,045).

During the same period of years, 1950-1970, the enrollment of the school district increased 114 per cent from 1950 to 1960 (1,950 to 3,534) and 128 per cent from 1960 to 1970 (3,534 to 8,064).

The community supports a public school system of nine school buildings, a faculty of 400 teachers and administrators and is attended by a student population of 8,064. The six elementary schools range in size from 365 children and 13 teachers to 645 children and 22 teachers. A full-time principal and office secretary are assigned to each elementary school.

Examination of the above data reveals the number of pupils attending school has nearly quadrupled (388%) in a period of twenty years. The Board of Education, School Administration, and citizens have demonstrated their interest in meeting the situation through numerous

building programs and the passing of operational millage necessary to maintain an over-all pupil-teacher ratio of 29 to 1 at the elementary school level for the past twenty years. Currently, the ratio is 26.5 to 1.

The Grand Blanc School District is a fourth-class school district administered by a Board of Education which is composed of seven elected members, serving without compensation, for staggered four-year terms. The board is responsible for determining the educational philosophy of the district and serving as a policy-making body. To put these responsibilities into practice, the board employs a Superintendent of Schools.

The superintendent makes recommendations to the board concerning the educational program, personnel, land, buildings, operating budget and the borrowing of money. His staff consists of a Deputy Superintendent in charge of curriculum and instruction who supervises the work of all building principals and all other administrative specialists in the areas of curriculum, personnel and instruction, and an Assistant Superintendent in charge of finance and administrative services.

By local board policy, a child must be five years of age by December 1 in order to enroll in school.

In general terms, the schools are operated on a ten-month year. By State law, each student in the district must receive a minimum of 180 days of instruction.

On the elementary school level, the curriculum of the Grand Blanc schools is designed primarily to teach the student the basic skills and understanding of communication, mathematics, social studies and science. These skills are further extended at the Junior High School and at that time, the child is provided opportunity to explore additional fields for new interests. At the high school level, the required work is designed to provide a background of general education, with elective courses to be chosen on the basis of post-graduate plans. The opportunity for students to gain more competence in vocational areas is provided by an area vocational center. About 55 per cent of the high school graduates enroll in various colleges, universities and technical schools. There is continual study of the curriculum by committees composed of teachers and administrators.

Throughout all grades, opportunities are provided students for creative expression in art, vocal and instrumental music and physical education.

Grand Blanc High School is accredited by the North Central Association of Colleges and Secondary Schools and by the State of Michigan through the University of Michigan.

The school health program is carried out by two nurses. They provide health services to the schools and

complement the instructional program in health education. In addition to the nurses the special services staff includes three speech correctionists who serve all schools; four school social workers who work with any level student who is having difficulty adjusting in school or the community; two teacher counselors for the physically handicapped who work with any student who has a physical problem which interferes with his or her learning, and a diagnostician who is employed to administer psychological tests. All special services personnel are directly supervised by the Coordinator of Special Services, a school psychologist.

The junior and senior high schools have central libraries and professional librarians. The elementary libraries are provided services of three professional librarians who are scheduled on an equalized basis. The elementary libraries are operated by full-time lay librarians whose activities are directed by the professional librarians. Teachers may obtain supplementary educational material such as audio-visual equipment, visual aids, and additional reference books at a central materials center.

All of the schools have outside recreation areas and a gymnasium. The high school has a swimming pool.

Free textbooks are provided all children. In addition, instructional supplies and materials are provided to the extent the budget will permit.

The money to build new school buildings comes entirely from the local real estate tax. The school building program is financed by bond issues for which all the property in the school district is taxed at the same rate, with values set by state equalized figures.

School district operating funds come from two sources, local property tax and state (per pupil) aid.

Significance of Study

This study will have particular significance for the Grand Blanc Community Schools to the extent that it will be a form of "before" and "after" experiment in an educational setting from which further hypotheses may be advanced. Other avenues of investigation may be identified and in general provide a sound base for launching additional studies into the many ramifications of team teaching and multi-age, nongraded patterns at the elementary school level.

The study should be significant for teacher training institutions and to the curriculum setup of those institutions engaged in the preparation of elementary school teachers.

Study findings should also be of significance to school districts located in communities similar to Grand Blanc.

Hypotheses of Study

Features of the nongraded, multi-age, team teaching plan have been identified which are presumed to result in educational outcomes superior to those achieved within the conventional self-contained classroom plan. These presumed superior outcomes are stated in the form of research hypotheses as follows:

Hypothesis 1:

Nongraded, multi-age, team teaching (NGMATT) makes possible higher levels of pupil academic achievement and creative activity than does the self-contained classroom (SCC) at grades three, four and five.

Hypothesis 2:

NGMATT encourages more favorable pupil attitudes toward school and learning than does the SCC at grades three, four and five.

Hypothesis 3:

NGMATT promotes more favorable teacher attitudes toward teaching at grades three, four and five than does the SCC type of organization.

Hypothesis 4:

NGMATT fosters more favorable parent attitudes toward the child's school experience at grades three, four and five than does the SCC type of organization.

The research hypotheses are expanded to the following operational hypotheses:

Hypothesis 1:

Pupil achievement in social studies in the NGMATT plan, as measured on the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC plan.

Hypothesis 2:

Pupil achievement in science in the NGMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 3:

Pupil achievement in reading in the NGMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 4:

Pupil achievement in mathematics in the NGMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 5:

Pupils in the NGMATT plan will demonstrate higher levels of creative thinking ability, as measured by the Torrance Tests of Creative Thinking, than will pupils who have been taught by a single teacher in the SCC plan.

Hypothesis 6:

Pupils in the NGMATT plan will exhibit more positive feelings about self and demonstrate higher levels of motivation for learning, as measured by the Self-Concept and Motivation Inventory, than will pupils who have been taught by a single teacher in the SCC plan.

Hypothesis 7:

Teachers in the NGMATT plan will report a more favorable attitude toward their job, as measured by a locally prepared instrument, than teachers who teach in a SCC plan.

Hypothesis 8:

Teachers in the NGMATT plan will reflect more progressive and fewer traditional attitudes toward teaching and education generally, as measured by the Education Scale, than teachers who teach in a SCC plan.

Hypothesis 9:

Parents of children in the NGMATT plan will report a more favorable attitude toward their children's school experience, as measured by a locally prepared instrument, than will parents of children taught by a teacher in the SCC plan.

Assumptions Underlying Study

Some basic assumptions have been advanced in connection with the present research plan. These are:

1. The measuring instruments used in the study are of sufficient reliability and validity to yield data satisfactory for the purposes of the study.
2. Respondents will answer items contained in the locally prepared questionnaires honestly and without being under duress or pressure of administrative desire or fiat.
3. Attitudes of teachers, parents and children are important to the learning environment.

4. The conventional self-contained classroom type of organization at grades three, four and five offers many advantages to children.

Definition of Terms

Language Arts.--The language arts are those verbal skills commonly used in the communication of ideas among humans. These four skills are either expressive in nature--speaking and writing--or receptive--listening and reading. They comprise the chief methods used by man in his interchange of ideas.

Social Studies.--Those portions of the subject matter of the social sciences, particularly history, economics, political sciences, sociology and geography which are developed into courses of study suitable for the elementary school.

Interest.--a. The preference displayed when choices are offered; b. A feeling which accompanies special attention to some content; c. An attitude characterized by focusing attention upon certain cognitive data.

Attitude.--a. A mental set to respond to a situation with a prepared reaction, whereas sets may be a temporary matter; b. A persistent mental state

of readiness to react to a certain object or class of objects, not as they are, but as they are conceived to be.

Nongraded, multi-age, team teaching.--a. Nongraded--A method of grouping students for instruction in which grade labels are not applied to students; instruction is given on an individual basis to students from a wide range of ages and abilities; b. Multi-age--An organizational pattern of assigning students for instructional purposes with a chronological age range of two to three years; c. Team teaching--The sharing in planning and conducting instruction offered to the same group of students by two or more teachers.

Instructional Organization.--The pattern or plan whereby pupils, teachers and the curriculum are brought together for fostering the objectives of the school.

Elementary School.--A public school having a curriculum offering instruction to children from age four or five (kindergarten) through age ten or eleven (fifth year).

Self-Concept.--Those parts of the phenomenal field which the individual has differentiated as relatively stable and definite parts or characteristics of himself.

Creativity.--A quality thought to be composed of broad continua upon which all members of the population may be placed in different degrees; the factors of creativity are tentatively described as associative and ideational fluency, originality, adaptive and spontaneous flexibility and ability to make logical evaluation.

Self-Contained Classroom.--A classroom in which one teacher instructs all the subjects, with the exception of such specializations as art, music and physical education.

With the background, purpose, significance, hypotheses, assumptions and definition of terms established, an investigation of related literature is now possible. This investigation is discussed in Chapter II.

Chapter III will present the general experimental design of the study, source of data, the sample of the study, data collection procedures including test instruments and a rationale for the usage of the statistical analyses to be employed in the study.

Chapter IV will present an analysis of the data obtained as well as the findings of the study. The nine operational hypotheses will be supported or rejected as a result of data analysis.

Finally, in Chapter V there will be a presentation of the summary and conclusions of the study plus implications for future research.

CHAPTER II

RELATED LITERATURE

Although as suggested in Chapter I, there exist many references in the professional literature to team teaching, the self-contained classroom, departmentalization, semi-departmentalization and various nongraded organizational patterns at the elementary school level, none have been discovered that deal specifically with the type of organizational arrangement which is the subject and major variable of the present study. Therefore it will not be possible to make direct contrasts from the available research in the field with the organizational features which characterize the aspects under investigation in the present study. Rather an attempt will be made to present and review various research findings associated with studies contrasting alternative organizational arrangements with the so-called self-contained classroom at the elementary school level. Certain analogies can be advanced on this basis and these will be presented in order to establish a general conceptual background of evidence to support the design of this particular research effort.

In their 1968 study entitled "Pupil Attitudes, Achievement and Behavior in a Multi-Age Nongraded School," Vogel and Bowers[1] reported that the effect of school organization on pupil attitudes, achievement, conceptual maturity and classroom behavior reflected a positive correlation. Ten teachers in each of three groups in a midwestern school district were selected and 707 pupils enrolled in their classes which comprise the sample of the study. An experimental group was placed in a non-graded form of organization. The pupils in all groups were subdivided into three age groups; normal age, under age and over age. The results of tests administered to the students suggested the following conclusions:

1. The nongraded form of organization encouraged pupil development and conceptual maturity and participation in group activities.
2. Teachers in the nongraded school were more tolerant of disorderly pupil behavior than were teachers in the graded schools.
3. The graded form of organization encouraged pupil development in achievement, attitude toward school and contributing activities during usual teaching episodes.

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[1]Francis X. Vogel and Norman D. Bowers, Pupil Attitudes, Achievement and Behavior in a Multi-Age Non-graded School. Final Report. (Northwestern University Press, 1968).

4. The differences among the age groups were generally as expected.

5. The behavior of the pupils identified as under age, normal age and over age, supported the multi-age nongraded plan of organization.

The study reviewed differed from the present study in that the feature of team teaching was not present in the organizational pattern employed. The features of nongradedness and multi-age do represent similarities with the organizational arrangement under the present study.

In another study, again by Vogel and Bowers,[2] the theory that the nongraded form of organization at the elementary school level is superior to the traditional graded form of organization as related to superior outcomes in pupil classroom behavior, attitudes and achievement was tested. The research design of this study involved the multivariate analysis of covariance, which was performed on one nongraded experimental group of 224 pupils and 2 traditional graded control groups totaling 483 pupils, all from the K-6 age range and divided into normal age, under age and over age groups for purposes of analysis.

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[2]Francis X. Vogel and Norman D. Bowers, "The Relationship of Form of School Organization to Pupil Behavior," (paper presented at the Annual Meeting of the American Research Association, Los Angeles, California, February 7, 1969).

Results of this study indicated that:

1. The nongraded form of organization encouraged development of conceptual maturity and participation in school activities.
2. Teachers in nongraded schools tended to be more accepting of disorderly pupil behavior as was reported in the prior study.
3. Graded organization appeared to encourage pupil development in achievement, attitude toward school and contributing activities during teacher episodes.
4. That over-age pupils in the nongraded school seem to be more contributing members of their classes than over-age pupils in graded schools.
5. Under-age pupils generally scored highest and over age lowest on the measures used.

Again as indicated in the prior study previously reviewed, the major difference between the research design employed in the study just presented differs from the subject of the present research project in that the feature of team teaching was not employed.

In 1963 Sister Mary Paul Hickey[3] reported the findings of a study entitled "An Analysis and Evaluation

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[3]Sister Mary Paul Hickey, "An Analysis and Evaluation of the Ungraded Primary Program in the Diocese of Pittsburg" (unpublished dissertation, Fordham University, 1963).

of the Ungraded Primary Program in the Diocese of Pittsburg." The purpose of this study was to analyze and evaluate the ungraded primary program of the Diocese of Pittsburg. The data were attained from four graded and four ungraded schools in Pittsburg, involving 745 ungraded and 603 graded students. The research evidence cited by the author indicated that the nongraded students scored significantly higher in reading achievement, arithmetic computation and problem solving. Secondly, high intellectual ability students benefited most in arithmetic in the nongraded organization. Third, consistently higher correlations between achievement and I.Q. were found in association with the ungraded students. Fourth, the results produced no significant difference in personal adjustment and fifth, large numbers of teachers expressed preference for teaching in the ungraded programs.

On the basis of her findings, the author advanced the following generalizations:

1. Ungraded pupils achieved better scholastically.
2. Capabilities of every individual were better provided for in the graded setup.
3. Personal adjustment was not affected by the organizational arrangements employed.

4. The teachers of students in the ungraded organizational arrangement reported that their students achieved more than those in the graded schools.

5. Parents believed that the ungraded schools were superior to the graded schools.[4]

In a study reported by Buffie,[5] designed to determine whether significant differences in mental health and academic achievement, as measured by the tests employed, between the control groups, which were graded and the experimental groups which were ungraded, the following findings were reported:

1. In all eleven areas of mental health and academic achievement tested, results favored ungraded.

2. In three areas there were significant differences in academic achievement at the .01 level; in two areas of mental health there were significant differences at .05 level.

In this study Buffie proposed the following additional generalizations:

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[4] Ibid.

[5] Edward George Buffie, "A Comparison of Mental Health and Academic Achievement: The Ungraded Versus the Graded School" (unpublished dissertation, Indiana University, 1963).

1. Evidence supported claims by proponents of the nongraded system as to academic achievement and general adjustment.

2. Children attending under the rationale of the nongraded primary arrangement appeared to be clearly superior in areas of language and work study skills as well as in over-all academic composite score.

3. There was a trend toward better adjustment in the nongraded primary arrangement.

4. No claim was made for having established causal effects.[6]

In 1967, Heathers[7] reported the results obtained from a five-year demonstration test (1958-63) of the Dual Progress Plan, which was conducted in grades three through six of the nine elementary schools and grades seven and eight of the junior high schools in Long Beach, New York and Ossining, New York. Related tryouts of the plan were reportedly made in fourteen other school systems across the country. The plan involves nongraded curricular sequences, employment of full-time specialist

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[6] Ibid.

[7] Glen Heathers, Organizing Schools Through the Dual Progress Plan--Tryouts of a New Plan for Elementary and Middle Schools (Danville, Ill.: Interstate Printers and Publishers, Inc., 1967).

teachers, and elimination of the self-contained general purpose classroom in favor of special laboratory classrooms, each equipped for instruction in one or two curricular areas. Objectives include mastery of communication skills and a knowledge of the nation's traditions and social behavior patterns, adaption of instruction to the individual student, improvement of instructional quality and stabilization of the student's emotional-social relationships by a half day in classes with his age-mates and core teacher.

The study concluded that:

1. The dual progress plan did not accomplish any major improvements in instructional quality.
2. Students, parents and teachers generally endorsed specialist teaching in changing classes.
3. Ability grouping appeared to have some harmful effects on both the academic achievement and the emotional-social adjustment of low-ability students.[8]

In 1969, Otto[9] reported an investigation in the area of nongradedness. In this study a comparative

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[8] Ibid.

[9] Henry J. Otto, et al., "Nongradedness: An Elementary School Evaluation," Bureau of Laboratory Schools Monograph No. 21 (Austin: The University of Texas Press, 1969).

evaluation of a nongraded school organization was made within a specific elementary school district in Austin, Texas. Grades one through six were studied. The six major hypotheses tested were that there are important differences and similarities between experimental (nongraded) and control (graded) classes in: one, the distribution of teachers' instructional time; two, the scope of instructional resources used in reading, spelling and arithmetic; three, the formation, number, size and achievement range of subgroups; four, pupils' use of the centralized library; five, children's school and anxiety and six, children's achievement. The results were mixed, although the data related to the fifth hypothesis did not verify the expectation of less anxiety; instead, anxiety appeared to increase over the school year in the nongraded program as reported in the study.

In 1964, Lambert[10] explored teaching and learning relationships or forms of classroom interaction in a team teaching arrangement and the differences between these and traditional classroom interactions with respect to student adjustment and student achievement. An attempt was made to improve the sophistication of

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[10]Philip Lambert, et al., Classroom Interaction, Pupil Achievement and Adjustment in Team Teaching as Compared with the Self-Contained Classroom (Madison: University of Wisconsin, 1964).

educational research instruments. A two-year, team teaching program involving an entire elementary school formed the basis of the study. Conclusions reported that significant differences in classroom interaction and student achievement existed between the team and self-contained class organizations favoring the team teaching setup, but no significant differences were found in personal and social adjustment, in teacher awareness of student characteristics, in absenteeism, in the frequency of discipline for infractions and in changes in the social structure within the classes organized on a team-teaching basis and those organized on a self-contained basis.

In another study by Lambert, Goodwin and Wiersma,[11] the effects of team teaching and the self-contained classroom setup on pupil adjustment were compared again. The study was conducted over a period of two years. The sample was composed of elementary pupils from two schools in an economically depressed area. Pupils were randomly assigned at one school either to a team organization or a self-contained classroom approach. The second control was included to detect possible contamination of variables and to lend greater

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[11]Philip Lambert, William L. Goodwin, and William Wiersma, "A Comparison of Pupil Adjustment in Team and Self-Contained Organizations," The Journal of Educational Research (March, 1965).

power to the statistical analysis. The two different classroom organizations produced only minor differences in adjustment. In the first year the group in team teaching made lower gains in adjustment than the groups in the self-contained classrooms. This difference did not persist in the second year.

It was concluded that either there were no organizational effects on pupil adjustment or the personality scales of the measuring instrument were not sensitive to such differences in adjustment. The February, 1963 edition of The Journal of Experimental Education reported a study conducted by Halliwell on "A Comparison of Pupil Achievement in Graded and Nongraded Primary Programs."[12] The purpose of the study was to determine whether there would be a significant gain in achievement of primary age level students after a variation of the nongraded primary unit was adopted and the comparison here was an achievement of reading and spelling after one year under nongraded with students in graded classes. The subjects for the study numbered 146 primary students who had been in the nongraded organization for one year and 149 students of the same age level from the more conventional graded setup.

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[12]Joseph W. Halliwell, "A Comparison of Pupil Achievement in Graded and Nongraded Primary Rooms," The Journal of Experimental Education (February, 1963).

The authors reported that nongraded pupils in the first grade obtained higher achievement scores in word knowledge and reading comprehension on the California Achievement test which were significant at the 1 per cent level of confidence.

At the second-grade level only in arithmetic was the difference found to be statistically significant. The findings favored the nongraded plan (at the 1% level) in arithmetic computation and spelling. In arithmetic problem solving, the difference was significant at the 5 per cent level. All of the differences in the study reported favored those youngsters assigned to the nongraded organization.

Some of the generalizations advanced by the author indicated that although the nongraded arrangement was used only in reading and spelling the gains in arithmetic were as great, or greater. Concomitant changes in methods, materials and attitudes occurred in addition to organizational change.

The author concluded that nongraded teaching of reading and spelling proved quite effective and therefore worthy of further investigation.

In 1962, Suttle[13] reported the following conclusions in his article on the nongraded elementary school:

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[13]John E. Suttle, "The Non-Graded Elementary School," Curriculum Bulletin, XVIII (1962), 12-19.

1. The nongraded type of school has emerged as a form believed to be more consistent with findings related to pupil variations; a form in which continuous progress may take place.
2. An increasing number of elementary schools are switching to a nongraded form of organization as of the date of the study.
3. Survey results reported in the study showed:
   a. The primary unit, so named by U.S. Office of Education, is being used by almost one-fifth of urban districts in the country.
   b. The most prevalent pattern of organization was determined to be either K-3 or 1-3 in the nongraded arrangement.
   c. Thirteen per cent of urban places not using the form indicated its possible future adoption.
   d. Exploration has been limited almost entirely to grades below the fourth.
4. Not enough research is available to make conclusive comparison of the graded versus nongraded as of the date of the study.
5. Advocates of the nongraded plan agree that much has yet to be learned regarding the way in which the increased flexibility can best be utilized.

In 1952, Dunn[14] reported the results of a survey type study designed to determine how the needs of children could best be served through various organizations of instruction. The results obtained and reported indicated:

1. The one-teacher (self-contained) classroom organization was predominant throughout the thirty-year period (1920-1950) and it gained popularity in the decade 1940-1950.
2. During the 1920's experimentation in search for solutions to over-crowding gave a better case for platoon schools and departmentalization. Achievement and subject matter ranked high in the minds of educators.
3. In the decade of the 30's, conflicting contentions prevailed. Advocates of both self-contained and departmental plans claimed the same advantages.
4. The 1940's saw an emphasis on total child growth and development and a gain in support for the self-contained classroom.

The generalization advanced by the author as a result of the survey indicated that opposing parties,

[14]Mary Dunn, "Should There Be Any Set Type of Elementary School Organization?" Elementary School Journal, LIII (December, 1952), 199-206.

self-contained advocates versus the departmentalized advocates, both claimed better discipline, fixed teacher responsibility and better learning experiences for children.

In 1968, McLoughlin[15] reported in the Phi Delta Kappan that he had identified thirty-three empirical studies which were concerned with the influence of non-grading on reading achievement, arithmetic performance, development in language arts, total achievement scores and other areas. In this group, fifteen studies were concerned with the influence of nongrading on the general reading achievement of children and in this category seven of the fifteen reported no significant difference between children from graded and nongraded classes. In this same category, six demonstrated the attainments of those in nongraded classes to be superior and two demonstrated that children in graded classes outscored the others. Similar outcomes were attained when the reading subskills of comprehension and vocabulary development were examined. The major finding of fourteen studies of the fifteen was that no marked differences in the accomplishments of children were found, regardless of the type of organizational arrangement in which they learned to read.

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[15]William P. McLoughlin, "The Phantom Nongraded School," The Education Digest, March, 1968.

McLoughlin also reported that in eleven other studies, general arithmetic achievement was considered. Of the eleven studies, three reported differences favoring children from nongraded classes, five reported differences favoring children from graded classes and three demonstrated no difference. Further, when the arithmetic subskills of reasoning and knowledge of fundamentals were examined, different outcomes occurred.

Of the twelve published studies examined in these areas of the curriculum, six reported differences favoring children from nongraded classes, one reported differences favoring those from graded classes and five demonstrated no actual difference.

In the language arts area, seven of ten studies examined demonstrated no real differences in the skills developed by children from graded and nongraded classes. One study reported the achievement test scores of children from graded classes as superior and two demonstrated differences in achievement of children from nongraded classes to be significantly different and superior.

In the area of total achievement test scores or composite scores, the author reported generally no difference. Half of the eight studies using total scores to measure the efficacy of the nongraded school demonstrated no significant differences in achievement of

children from the graded and the nongraded classes. The author reported that the outcomes of the remaining studies were also equally divided.

The reporting of research results in the areas just enumerated are relevant to the present study in that the emphasis of comparison was between the conventional self-contained classroom and the so-called nongraded organization.

In his article McLoughlin speculates that frequently, on close inspection, schools credited with operating nongraded programs are not nongraded at all, but that homogeneous grouping and semi-departmentalization of instruction in reading and arithmetic are frequently passed off as nongraded programs. The author maintains that these techniques must be recognized for what they are: administrative expediencies developed to make the graded school work.

In the present study the feature of nongrading is coupled with the features of team teaching and multi-age grouping. Thus the element of a different instructional pattern, as perceived and practiced by the teacher, suggests a significant difference from the research studies associated exclusively with the nongraded arrangement. Therefore, although in the present chapter a reporting of the findings in the nongraded area does not appear to have direct bearing on the

present study, relevance is established because non-grading is one of the organizational features associated with the study design.

In the area of team teaching, the National Education Association project on the instructional program of the public schools[16] reported a small increase since 1956 in team teaching in elementary and a slightly larger increase in secondary schools with more teachers in teams in elementary schools than in high schools. Lambert[17] stated that no valid scientific study had been made of team teaching as a whole and predicted that there would be no such study in the next ten or fifteen years. Shaplin and Olds[18] supported this view and described projects of team teaching as demonstrations of preferred educational practices without research design.

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[16]National Education Association, The Principals Look at the Schools (NEA, 1962), p. 75.

[17]Philip Lambert, "Team Teaching for Today's World," Teachers College Record, LXIV (March, 1963), 480-86.

[18]Judson T. Shaplin, "Toward A Theoretical Rationale for Team Teaching," in Team Teaching, Chapter 3 (New York: Harper & Row, 1964), pp. 57-98. (Hereinafter referred to as Team Teaching.); Henry F. Olds, "A Taxonomy for Team Teaching," in Team Teaching, Chapter 4 (New York: Harper & Row, 1964), pp. 99-122. (Hereinafter referred to as Team Teaching.)

Brownell and Taylor[19] advised closer examination of assumptions, formulation of more explicit models, use of improved research design and more penetrating evaluation of team experimentation. Genther and Shrover[20] reported that teacher enthusiasm and pupil interest provided support to team teaching. Johnson and Lobb[21] and Shoresman[22] reported that teacher prestige, morale and adaptability were enhanced by relieving teachers of routine chores and by increasing their status. Davis[23] indicated that certain categories of teachers react negatively to their roles as team members. Shaplin

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[19]John A. Brownell and Hannis A. Taylor, "Theoretical Perspectives for Teaching Teams," Phi Delta Kappan, XLIII (January, 1962), 150-57.

[20]John R. Ginther and William A. Shrover, "Team Teaching in English and History at the Eleventh-Grade Level," School Review, LXX (Autumn, 1962), 303-13.

[21]R. H. Johnson and M. D. Lobb, "Jefferson County, Colorado, Completes Three Year Study of Staffing, Changing Class Size, Programming, and Scheduling," National Association of Secondary School Principals Bulletin, XLV (January, 1961), 57-78.

[22]Peter B. Shoresman, "A Comparative Study of the Effectiveness of Science Instruction in the Fifth and Sixth Grades Under Two Different Patterns of Teacher Utilization and Pupil Deployment" (unpublished Ph.D. dissertation, Harvard University, 1963).

[23]Harold S. Davis, "The Effect of Team Teaching on Teachers" (unpublished Ph.D. dissertation, Wayne State University, 1963).

and Olds[24] felt that a major problem is defining new roles and training experienced teachers to fill team positions.

In concluding the discussion of related literature it should be noted that Goodlad and Anderson[25] related nongradedness to flexible scheduling, cooperative teaching and flexible grouping practices. These relationships were supported by Brown[26] in the first full-length book devoted to nongraded secondary schools. Goodlad and Anderson urged consideration of multi-age and multi-grade grouping patterns and suggested justifications resulting in both social and academic benefits to pupils when such patterns are employed. It is the purpose of the present study to make this type of comparison, that is, the conventional self-contained classroom and its effects upon students in grades three through five versus the effects of multi-age nongraded cooperative or team teaching arrangements. The results of these comparisons will be presented and discussed at length in Chapter IV.

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[24]Shaplin, Team Teaching and Olds, Team Teaching.

[25]John I. Goodlad and Robert H. Anderson, The Nongraded Elementary School (rev. ed.; New York: Harcourt, 1963).

[26]Frank B. Brown, The Nongraded High School (New York: Prentice-Hall, 1963).

CHAPTER III

DESIGN AND PROCEDURES OF STUDY

The general experimental design of the study, source of data, the sample of the study, data collection procedures including test instruments and a rationale for the usage of the statistical analysis to be employed in the study are presented in Chapter III.

Source of Data

The samples employed in the present study were drawn from a population of third, fourth, and fifth grade students of two public elementary schools in the Grand Blanc Community Schools, Grand Blanc, Michigan. The two schools selected for this study were Indian Hill Elementary and Cook Elementary. The Indian Hill School was selected as the control school for purposes of comparison in the present study on the basis of the contention that the population and the socio-economic environment is comparable to the conditions at the Cook School. In addition the principal of Indian Hill School expressed an interest and willingness to participate in

the study. The two schools were organized to house and carry out the formal education of children in grades kindergarten through five.

At the time of the study the present investigator was serving as superintendent of the Grand Blanc Community Schools. The investigator and the deputy superintendent introduced the concept of nongraded, multi-aged, team teaching (NGMATT) in the district with the enthusiastic approval of the Board of Education. NGMATT was employed in the Cook Elementary School while Indian Hill Elementary employed the self-contained classroom plan of organization. The willingness and support of the Board to invest financially in the research effort served as the basis for selecting Grand Blanc as the study site.

Sample for Data Collection

Three teams of four teachers--each serving grades three, four and five for a total of twelve teachers--were involved in the test setting. The control group teachers consisted of seven in number. It is of importance to point out again that the NGMATT organization was introduced in the grades designated as "experimental" two years prior to the data-gathering year. This circumstance provided two years of experience with the NGMATT techniques for participating teachers. The primary

purpose of this kind of teacher and administrator pre-training was an attempt to offset for the so-called "Hawthorne effect."

In addition, it should be noted that initially the introduction of the NGMATT plan took into account the element of teacher readiness. Generally, the major aspects of building flexibility and resulting varieties of grouping techniques were informally practiced at the Reid and Indian Hill Schools over a period of three years prior to the establishment of the program at Cook School. In the original and subsequent staffing of positions at Cook School, attempts have been made to secure from within the existing elementary staff in the district, teachers who were ready and interested in participating in the NGMATT program at Cook. All new staff members assigned as replacements at Cook have been specifically screened and selected for the assignment.

The study sample of students was selected from a pool of 535 available third-, fourth- and fifth-grade pupils to fill a grid designed specifically to coincide with an analysis of covariance design. A statistical program was set up to properly test the null hypotheses as indicated by such a design.

The final breakdown of total N for each variable and for individual experimental and control school as

represented by cells in the grid may be seen in the example covariance grid-social studies STEP test, Appendix A, Exhibit A. Similar grids were prepared for each experimental test separately. Thus, individual grids were prepared for the following tests: (1) STEP - Social Studies; (2) STEP - Science; (3) STEP - Mathematics and (4) STEP - Reading. All subjects from the experimental group were compared with all subjects from the control group.

Each cell in the grid contained pre- and post-test scores for all subjects at each grade level, thus accounting for a total of 332 experimental and 203 control subjects for a grand total of 535 cases. The following variables were set as criteria for purposes of comparison: (1) grade (grades three, four and five); (2) school (experimental, Cook; and control, Indian Hill) and (3) subject area (science, mathematics, reading and social studies). Since subjects cannot be selected at random--in the classical manner--and it is necessary to assign experimental conditions to intact classes, the analysis of covariance design was regarded best suited for purposes of the present study. As is the case in many education experiments, intact classes were used, thus taking into account the initial differences between the experimental and control groups. In reality, this type of design presumes to test the significance of

differences between the experimental and control groups. In reality, this type of design presumes to test the significance of differences between means of the final experimental data by taking into account and adjusting initial differences in the data. In effect, the analysis of covariance statistically matches subjects for the investigator.

Instrumentation

The measures employed in the present study are as follows:

1. Standardized Tests

   (1) STEP Level Four - Reading Forms 4A, 4B
   STEP Level Four - Social Studies Forms 4A, 4B
   STEP Level Four - Science Forms 4A, 4B
   STEP Level Four - Mathematics Forms 4A, 4B

   (2) Torrance Tests of Creative Thinking

   (3) Self-Concept and Motivation Inventory

2. Teacher Questionnaire--This instrument was locally prepared and designed to solicit an expression of the teacher's opinion and attitude toward certain characteristics of their teaching assignments and the general plan of school organization at the elementary level. A pilot run to validate the questionnaire was made to

eliminate as much as possible, ambiguity of interpretation by the respondents.

3. Parent Questionnaire--This instrument was locally prepared and designed to solicit the parents' feelings concerning the inschool experience of their child. A pilot run to validate this questionnaire was also made.

The STEP tests were selected to measure academic achievement and concept formation in the broad curriculum areas of science, reading, social studies and mathematics. Results can be obtained in raw scores and percentile bands. For purposes of the present study, the results are reported in raw score units. More specifically, the STEP tests were designed to measure the outcomes of total educational experiences both formal and informal from elementary school to college. In constructing the tests, it was the intention of the authors of the test to emphasize the utilization of learned skills in solving new problems encountered by the subject being tested. The objectives of the tests are considered as being sufficiently general to be considered attainable by a vast variety of teaching procedures and materials. Thus, the tests were regarded to be the most suitable from among the tests available for purposes of the present study.

The Torrance Tests of Creative Thinking represent the culmination of nearly nine years' research by their author, Dr. E. Paul Torrance, and his colleagues into the nature of creative thinking and its assessment. They also represent a pioneering venture in making available to the research and educational community instruments designed to detect and measure, in a useful and functional fashion, creative thinking potential in children, adolescents and adults.

Both the publisher, Personnel Press, Inc. and the author are aware that this publishing step is being taken while knowledge and understanding about creative thinking are yet in a relatively underdeveloped state. Under these conditions, assessment cannot have reached the level of technical excellence that is eventually desired for it. On the other hand, publication of creative thinking tests in their present condition should encourage research, facilitate data gathering and accomplish the very widening of knowledge in this area that is so urgently needed.

Even at their present stage of development, these tests, according to their author, are considered ready for use in certain kinds of applications. These uses are described in the introductory chapter of the test manual. From the manual the following suggested uses have relevance to the present study:

(1) Studies designed to discover effective bases for individualizing instruction;

(2) Assessing the differential effects of various kinds of experimental programs, new curricular arrangements, or materials, organizational arrangements, teaching procedures and the like.

(3) As a means of becoming aware of potentialities that might otherwise go unnoticed.

Since any measuring instrument should be evaluated in terms of the definition of the phenomena it is designed to assess and since its results should be interpreted in terms of this definition, an attempt will be made to summarize the author's definition of creativity. It is generally held that if creativity is to be viewed scientifically, it must be defined in a way that permits objective observation and measurement and is compatible with common and historical usage. At the time the author began a program of research concerned with factors affecting creative growth, he was unable to find such a definition for which there was consensus.

On the basis of an analysis of the diverse ways of defining creativity and the requirements of a definition for keeping a program of research focused on factors affecting creative growth in context, the

author defined creativity as a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on: identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies; testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results.

The academic Self-Concept and Motivation Inventory (SCAMIN) profile consists of four scores: Goal and Achievement Needs, Failure Avoidance, Role Expectations and Self-Adequacy.

The following are definitions and elements of the Self-Concept and Motivation Inventory (SCAMIN):

Definition of Self-Concept.--The Academic Self-Concept is how a child views his role as a learner in school. It is the student's sum of experiences, perceptions, attitudes and feelings about school and schoolwork.

Definition of Motivation.--Academic Motivation is the expressed need of a child to achieve a goal in school, and the moderate avoidance of the child toward failure in school--avoidance below the point of anxiety. Motivation has a strong element of cooperative adjustment toward school.

Elements of Self-Concept.--Self-Concept is made up of Role Expectations and Self-Adequacy: Role Expectations is the positive acceptance of the aspirations and demands that the student thinks others--significant others--expect of him; Self-Adequacy is the positive regard with which a student views his present and future probabilities of success.

Elements of Motivation.--Motivation is made up of Goal and Achievement Needs and Failure Avoidance: Goal and Achievement Needs is the positive regard with which a student perceives the intrinsic and extrinsic rewards of learning and performing in school. Failure Avoidance is the awareness and concern toward shunning the embarrassment and sanctions which are associated with failure in school. When Failure Avoidance is extremely high without support from the self-concept, realistic avoidance becomes anxious fear. Anxious fear or Failure Anxiety stifles achievement.

Significant Others.--Significant Others refers to parents, siblings, peers, teachers, and sometimes to the counselors, neighbors, adult relatives and friends of the family which have an impact in the child's life. The student views his significant others as models for his behavior. They confer the approval and disapproval that seems to matter. Significant others tell the

student in many ways what he is and how he is expected to act. They establish a climate which threatens or supports.

Intrinsic and Immediate Orientation.--The Immediate and Intrinsic Orientation (Secondary Form only) describes activity which favors: Evaluated Competition, Tasks and Projects, Discovery and Creativity and the development and growth of Skills.

Fulfillment Orientation.--The Fulfillment Orientation (Secondary Form only) reflects behavior which strives to fulfill roles. The roles of Aspiration, Cooperation and Conformity, Responsibility and Acceptance and Praise are extrinsic from the activities from which they derive.

The Self.--Some expectations, standards, needs and fears become internalized so that their source of support seems to be part of the conscience, super-ego, or self. Academic Self and the Physical and Social Self (the latter on the Secondary Form) imply the judgment of an ideal self as a significant other.

Academic Activity and School Climates.--Climates refer to a multitude of needs and "press" (demands) which cluster around the student's relationship toward people, institutions and activities. The Academic

Activity Climate is the positive association toward doing schoolwork. The School Climate is the nonacademic and extracurricular milieu of the school as the student perceives it.

Procedures

The principal data-gathering instruments used in this project were standardized tests, previously enumerated and locally prepared and validated opinion and attitude inventories.

A. Pre- and post-achievement, self-concept and creativity testing of students was accomplished in December, 1969, and May, 1970, respectively.

B. Teacher and parent attitude toward the elementary school program was solicited in the school year 1970-71. A means for preserving anonymity of each respondent was devised.

The standardized tests, which comprised the bulk of the data-gathering instruments were administered by the individual school principals. The principals for the Cook and the Indian Hill Schools administered the standardized tests to their respective participating classes. Each participating classroom teacher assisted his principal and acted as testing proctor. Prior to administering the tests, both principals met with the Deputy Superintendent to discuss the uniformity of test

administration procedures, and particularly, to arrive at standard directions to be employed in the testing procedures. All standardized tests were administered to all participating students within a period of one week in both the "pre-test" and "post-test" situations. The "pre-test" period occurred during the month of December, while the "post-test" period took place during the month of May for both groups of students alike. Entire grade levels were tested at the same time. Following the administration of the standardized tests, the results were forwarded by each principal to the Deputy Superintendent who in turn forwarded the results to the Oakland Intermediate School District for scoring and analysis.

Statistical Analysis

One of the major difficulties of educational and sociological research is that the investigator is unable to set up experimental and control groups. The investigator in such cases must use classes intact; that is he frequently must study groups as they are. Subjects cannot be matched or assigned at random. Through the analysis of covariance, it is possible to control class or other group differences statistically. In such a situation, the random assignment of subjects may not be possible, but we must keep in mind that it is possible to use intact classes, therefore, experimental conditions

can be assigned to the intact classes at random. More cogently put, the analysis of covariance would then analyze the differences between experimental groups on variable Y after taking into account either initial differences in the Y measures or differences in some pertinent independent variable. The analysis of covariance is a form of analysis of variance that tests the significance of the differences between means of final experimental data by taking into account and adjusting initial differences in the data. In effect, the analysis of covariance statistically matches subjects in a difficult situation such as being forced to take intact classes, the investigator gets the advantage of random assignment and the benefits of matching without the inherent difficulties of arranging the matching. In the case of a pre-test, post-test design, the analysis of covariance would be used to analyze the final measures for significant differences between the groups. As Tate puts it: "It is also possible to introduce control in two or more classes of experimental data by making allowance for initial differences among the classes which may have prejudiced the results of the treatment."[1]

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[1]Merle W. Tate, Statistics in Education (New York: The Macmillan Company, 1955).

Basically, covariance may be defined as the average of the cross products of the deviation scores of two variables X and Y (a deviation score is defined, e.g., $x = X - M_x$; or $y = Y - M_y$). When a given number of subjects have X scores and Y scores, we then have a set of ordered pairs, with the X score occurring first in all the pairs. If these raw scores are reduced to deviations scores, x and y, we then have another set of ordered pairs. When the x's and the y's are multiplied, the cross products are summed and we have a measure which is analogous to the sum of squares of the analysis of variance. In the analysis of covariance, the cross products summed are referred to as "the sum of cross products" and this is conventionally written, e.g., $\Sigma x\ y$. Just as the analysis of variance works with sums of squares and variances, the analysis of covariances works with the sums of cross products and covariances, as well as with the sum of squares.

The final outcome of the procedure explained above is an analysis of covariance table that tests for significance of the differences of the Y means of the experimental groups after adjustment of the Y sums of squares. This adjustment removes from the Y variable sum of squares that part due to the relation between the X variable and Y variable. What usually emerges for a final analysis of covariance table are the

adjusted total between groups, and within groups sums of squares. Ordinarily, variance (Means squares) and the F-ratio are computed from these adjusted measures. In the case of pre-post-test designs, the difference scores are analyzed (post-test-pre-test scores) by using a "t" test.

In this chapter the design of the study and the procedures employed have been described. Further, the source of the data, the sample of the study, the data collection and the rationale for the usage of the analysis of covariance statistic have been presented. We are now ready to present the analysis of the data and the findings of this study in Chapter IV.

CHAPTER IV

ANALYSIS OF DATA AND FINDINGS

Sorting and Classifying the Data

The data employed in the study are of two types: (1) those of the nominal scale of measurement (e.g., questionnaire data), and (2) those of the interval scale of measurement, i.e., data produced by the standardized tests utilized in the study. Although these two types of data are both essential to the study findings, the type of data considered most important to the study effort are those of the interval scale of measurement.

Since nonparametric statistical techniques are the appropriate ones for the analysis of data of the nominal level of measurement, while parametric tests are the most efficient approaches to analyzing data of the interval level of measurement, one of the early problems of the study was that associated with deciding upon which of the nonparametric and the parametric statistical tests to employ in the analysis of the data. After considerable deliberation it was decided that the data of the nominal level of measurement could be utilized as

descriptive or classificatory information, and therefore the need for an appropriate nonparametric statistical inference test was eliminated. Thus, much of the data produced by the questionnaires employed in the study were used to describe the relationships of attitudes investigated and the factors employed in the factorial analysis of the data of an interval level of measurement.

The parametric statistical test considered to be the most efficient analytical technique for the purposes of the study was that of the analysis of covariance. How this technique was employed in the study will now be presented.

Analytical Techniques

The analysis of covariance is a technique that can be used efficiently and effectively in analyzing data produced by "before and after" types of experiments or research studies. Since the present study is of the "before and after" type, the analysis of covariance technique designed to test for significant differences between adjusted group means was the one that was employed.

Since a full discussion of the analysis of covariance technique was presented in Chapter III, it will not be repeated here (see pages -).

At this point, some technical factors should be mentioned relative to the statistical analysis employed

in conjunction with the analysis of covariance design. Since the F ratios were obtained by computing adjusted mean squares, comparison of means were made where significant "F" ratios were obtained. These comparisons were made on the basis of inspecting adjusted means. The adjustment of the means was accomplished by employing the following formula:

$$\bar{Y}_k = \hat{Y}_k - b\ (\bar{X}_k - \bar{X})$$

where $\bar{Y}_k$ is the adjusted mean; $\hat{Y}_k$ the group's post test score mean; b the coefficient of regression ($b = \frac{\varepsilon xy}{\varepsilon x^2}$ for the error term only) $\bar{X}_k$ the mean of the group for the pre-test score; and $\bar{X}$ the grand mean for all subjects of both the experimental and control groups for post-test scores only. An Analysis of Covariance Table precedes each discussion of individual achievement test results. These tables provide convenient sources of reference to results as depicted by observed and critical F-ratios in relation to the adjusted mean score.

In referring to the Analysis of Covariance Table the reader may identify significant differences by comparing the Observed F-Ratio at the .05 level, and to determine which group the significant differences favored, the reader must visually compare the adjusted means of the experimental and control groups. An added feature of the table will provide a column which

will indicate the rejection or nonrejection of individual null hypotheses associated with each factor investigated in the present study.

In order to adequately investigate the nine operational hypotheses listed in Chapter I, a plan was devised which supports the statistical procedure of analysis of covariance to test the null hypotheses associated with each of the standardized tests selected as criterion measures. The standardized tests were analyzed separately with emphasis on the null hypotheses.

The statistical model utilized in the design of the present study provides for the testing of four research hypotheses associated with the operational hypotheses stated in Chapter I. The procedure adopted for reporting of results associated with the achievement test findings will include a statement of the null hypothesis, a tabular presentation of data and a discussion of results as they relate to the appropriate operational hypothesis.

Achievement Test Results

For the student achievement area of social studies, the null hypothesis stated:

> There are no differences in the adjusted mean score of the experimental and control groups.

Tables 1, 2 and 3 depict the analysis of covariance results with adjusted group means for the experimental and control groups and a column showing the rejection or nonrejection of the null hypothesis for the social studies STEP test.

TABLE 1.--Analysis of covariance table for the social studies STEP test

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 74 S.D. 9.78 $\bar{X}$ 29.14	N 44 S.D. 8.45 $\bar{X}$ 26.09	2.95	3.92	
Post-Test Score	N 74 S.D. 9.46 $\bar{X}$ 30.46	N 44 S.D. 9.83 $\bar{X}$ 26.61	4.43	3.92	
Adjusted Mean Score	$\bar{X}$ 29.74	$\bar{X}$ 27.82	1.72	3.92	Non-Reject

It is noted in Table 1 that the null hypothesis of no difference was nonrejected on the basis that the adjusted mean score was not found statistically significant at or beyond the .05 alpha level.

An inspection of the adjusted means shows that the nonsignificant difference between the experimental and control groups does not suggest support for either approach in the area of social studies for third-grade children.

TABLE 2.--Analysis of covariance table for the social studies STEP test

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio at .05 Level	Null Hypothesis (Ho)
Pre-Test Score	N 80 S.D. 9.93 $\bar{X}$ 33.49	N 61 S.D. 11.68 $\bar{X}$ 36.77	3.25	3.84	
Post-Test Score	N 80 S.D. 11.65 $\bar{X}$ 35.66	N 61 S.D. 12.76 $\bar{X}$ 38.05	1.34	3.84	
Adjusted Mean Score	$\bar{X}$ 36.98	$\bar{X}$ 36.32	0.29	3.84	Non-Reject

TABLE 3.--Analysis of covariance table for the social studies STEP test

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 89 S.D. 11.97 $\bar{X}$ 38.01	N 57 S.D. 12.61 $\bar{X}$ 43.07	5.95	3.84	
Post-Test Score	N 89 S.D. 12.85 $\bar{X}$ 37.02	N 57 S.D. 13.39 $\bar{X}$ 45.82	15.78	3.84	
Adjusted Mean Score	$\bar{X}$ 38.71	$\bar{X}$ 43.19	10.82	3.84 (.05) 6.63 (.01)	Reject

A review of Table 2 will reveal that the "no difference" null form of the hypothesis was nonrejected as a result of the lack of statistical significance at the specified alpha level.

Here, as in the prior instance, the adjusted mean score produces no evidence that lends support to the approach of either the SCC or the NGMATT in the area of social studies for children in the fourth grade.

In Table 3 the null hypothesis can be rejected in as much as the adjusted means for the experimental and control groups demonstrate statistical significance beyond the .05 level. More specifically the findings of statistical significance exceed the .01 alpha level $F\ (1,143) = 6.63$, $p < .01$. Support appears to be found in this case favoring the SCC control approach in the social studies area of the curriculum for fifth-grade boys and girls.

Thus, the statistical results discussed regarding social studies achievement do not indicate support for operational Hypothesis 1 which states:

> Hypothesis 1:
>
> Pupil achievement in social studies in the non-graded, multi-age, team teaching plan as measured on the STEP test, level four, will be greater than the achievement of pupils taught by a single teacher in the self-contained classroom.

The adjusted means obtained in the social studies tests showed that the SCC organization and approach excelled over the NGMATT plan for fifth graders as measured by the STEP test in this area of the school's curriculum.

At the third- and fourth-grade levels respectively, neither the NGMATT plan nor the SCC manifested superiority as measured by the same instrumentalities.

In the curricular area of science, the null hypothesis stated:

Null Hypothesis:

There are no differences in the adjusted mean score of the experimental (NGMATT) and control (SCC) groups.

In the next series of data, Tables 4, 5 and 6 will be presented in the identical format previously introduced; that is the analysis of covariance results with adjusted group means for both groups and a separate column designating the rejection or the nonrejection of the null hypothesis for, in this case, the science STEP test.

Table 4 affords a visual representation of the analysis of covariance data information for the science STEP test results.

TABLE 4.--Analysis of covariance table for the science STEP test

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 74 S.D. 9.61 $\bar{X}$ 23.62	N 44 S.D. 8.08 $\bar{X}$ 21.09	2.15	3.92	
Post-Test Score	N 74 S.D. 9.13 $\bar{X}$ 28.11	N 44 S.D. 9.15 $\bar{X}$ 24.75	3.73	3.92	
Adjusted Mean Score	$\bar{X}$ 27.39	$\bar{X}$ 25.95	1.54	3.92	Non-Reject

TABLE 5.--Analysis of covariance table for the science STEP test

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 80 S.D. 9.87 $\bar{X}$ 30.02	N 61 S.D. 10.72 $\bar{X}$ 30.57	0.10	3.84	
Post-Test Score	N 80 S.D. 9.07 $\bar{X}$ 33.13	N 61 S.D. 11.27 $\bar{X}$ 33.43	0.03	3.84	
Adjusted Mean Score	$\bar{X}$ 33.30	$\bar{X}$ 33.19	0.01	3.84	Non-Reject

TABLE 6.--Analysis of covariance table for the science STEP test

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 89 S.D. 9.60 $\bar{X}$ 34.29	N 57 S.D. 10.00 $\bar{X}$ 37.42	3.57	3.84	
Post-Test Score	N 89 S.D. 10.23 $\bar{X}$ 34.45	N 57 S.D. 9.23 $\bar{X}$ 38.89	7.07	6.63	
Adjusted Mean Score	$\bar{X}$ 35.44	$\bar{X}$ 37.34	3.56	3.84	Non-Reject

The null hypothesis is clearly nonrejected as the adjusted mean scores of the study groups fail to achieve differences that are statistically significant at the .05 level.

This condition does not therefore indicate superiority for either the NGMATT or the SCC approach in the area of science for third-grade students.

As may be seen in Table 5, the effects of NGMATT and SCC were not found to be statistically significant, thus the null hypothesis associated with these factors could not be rejected at the .05 level of confidence.

Again, in reality, these results seem to indicate that neither children working in the SCC organization nor

children working in the NGMATT plan at the fourth-grade level benefited more in the academic area of science under one approach than in the other.

With reference to Table 6 it is noted again, that here also, in the area of science for fifth graders the null hypothesis was not rejected.

Similarly, in this condition, youngsters at the fifth-grade level did not appear to benefit academically more under one plan than the other as measured by the instrumentations employed for purposes of the present study.

A review of the statistical results presented therefore lend no support for operational Hypothesis 2; stated as follows:

> Hypothesis 2:
>
> Pupil achievement in science in the MGMATT plan, as measured by the STEP test, level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

In summary, the adjusted mean scores derived from science achievement test results lend no support for an assumption of superiority associated with either the NGMATT nor the SCC approach for pupils working at the third-, fourth- and fifth-grade levels of the elementary school under the conditions of the present study effort.

In the curricular area of reading achievement for third-grade pupils the null hypothesis states:

Null Hypothesis:

There are no differences in the adjusted means of the experimental and control groups.

An examination of Table 7 indicates no statistical significance in the adjusted mean scores of the groups employed in the present study. It is on this basis that the null form of the hypothesis is not rejected.

TABLE 7.--Analysis of covariance table for the reading STEP test

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 74 S.D. 12.09 $\bar{X}$ 32.28	N 44 S.D. 9.72 $\bar{X}$ 29.30	1.94	3.92	
Post-Test Score	N 74 S.D. 13.75 $\bar{X}$ 33.66	N 44 S.D. 15.20 $\bar{X}$ 32.95	0.07	3.92	
Adjusted Mean Score	$\bar{X}$ 32.71	$\bar{X}$ 34.56	0.82	3.92	Non-Reject

Table 8 presents the results obtained for the academic achievement area of fourth-grade reading. The adjusted mean score presented does not reflect a statistically significant difference at the specified alpha

level. Therefore the null hypothesis of no difference between groups in the reading curriculum of fourth-grade children is nonrejected.

TABLE 8.--Analysis of covariance table for the reading STEP test

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 80 S.D. 11.51 $\bar{X}$ 37.99	N 61 S.D. 13.38 $\bar{X}$ 39.52	0.54	3.84	
Post-Test Score	N 80 S.D. 13.00 $\bar{X}$ 40.21	N 61 S.D. 15.04 $\bar{X}$ 41.95	0.54	3.84	
Adjusted Mean Score	$\bar{X}$ 40.83	$\bar{X}$ 41.14	0.05	3.84	Non-Reject

As noted in Table 9 the adjusted mean score for fifth-grade reading achievement does not demonstrate an advantage that is statistically significant for either the NGMATT children or their SCC peers. The null hypothesis is thus not rejected.

In conclusion for the reading achievement of pupils in the third, fourth and fifth grades, the obtained results suggest no statistically significant differences may be expected between children participating in a NGMATT organization and those assigned to a

SCC situation. Therefore, the results obtained in the present study in the curricular area of reading do not lend support to operational Hypothesis 3 which states:

Hypothesis 3:

Pupil achievement in reading in the NGMATT plan, as measured by the STEP test, level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

TABLE 9.--Analysis of covariance table for the reading STEP test

	Grade Five			
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 89 S.D. 13.14 $\bar{X}$ 42.87	N 57 S.D. 11.04 $\bar{X}$ 46.14	2.44	3.84	
Post-Test Score	N 89 S.D. 14.25 $\bar{X}$ 44.26	N 57 S.D. 12.95 $\bar{X}$ 47.70	2.18	3.84	
Adjusted Mean Score	$\bar{X}$ 45.45	$\bar{X}$ 45.85	0.09	3.84	Non-Reject

The achievement of third-grade students in the area of mathematics is depicted in Table 10 as manifesting no statistically significant advantage to either the NGMATT plan nor the SCC set-up. This assertion is borne out by the comparison of adjusted mean scores which does not reflect the statistical requirement of the .05 level.

TABLE 10.--Analysis of covariance table for the mathematics STEP test

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 74 S.D. 6.32 $\bar{X}$ 18.27	N 44 S.D. 6.19 $\bar{X}$ 16.27	2.80	3.92	
Post-Test Score	N 74 S.D. 6.72 $\bar{X}$ 18.73	N 44 S.D. 5.41 $\bar{X}$ 16.66	3.01	3.92	
Adjusted Mean Score	$\bar{X}$ 18.28	$\bar{X}$ 17.41	0.80	3.92	Non-Reject

In Table 11 it is noted that the null hypothesis of no difference between NGMATT and the SCC was statistically significant beyond the .01 level $F(1,138) = 6.63$, $p < .01$. Support, as reflected by the data of Table 11 appears to favor fourth-grade children assigned to the SCC in the area of mathematics. As indicated in the table the null hypothesis is rejected in this particular case.

A visual inspection of the "Null (Ho)" column in Table 12 indicates that the factor of adjusted mean score failed to reach a level of statistical significance required for rejection of this hypothesis. The condition noted suggests that no significant difference was obtained between the SCC and the NGMATT groups for

TABLE 11.--Analysis of covariance table for the mathematics STEP test

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 80 S.D. 6.70 $\bar{X}$ 21.86	N 61 S.D. 7.99 $\bar{X}$ 21.92	0.00	3.84	
Post-Test Score	N 80 S.D. 7.64 $\bar{X}$ 21.30	N 61 S.D. 8.77 $\bar{X}$ 23.85	3.40	3.84	
Adjusted Mean Score	$\bar{X}$ 21.32	$\bar{X}$ 23.83	7.91	3.84 (.05) 6.63 (.01)	Reject

TABLE 12.--Analysis of covariance table for the mathematics STEP test

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 89 S.D. 7.50 $\bar{X}$ 24.93	N 57 S.D. 8.05 $\bar{X}$ 27.46	3.72	3.84	
Post-Test Score	N 89 S.D. 8.23 $\bar{X}$ 26.15	N 57 S.D. 8.75 $\bar{X}$ 29.74	6.30	3.84	
Adjusted Mean Score	$\bar{X}$ 26.99	$\bar{X}$ 28.42	2.50	3.84	Non-Reject

fifth-grade mathematics achievement as measured by the STEP test level four. These results imply that neither the experimental nor the control group performed significantly better with respect to this particular area of educational achievement.

Operational Hypothesis 4 indicates:

Hypothesis 4:

> Pupil achievement in mathematics in the NGMATT plan, as measured by the STEP test, level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

The achievement results obtained in the area of mathematics for third-, fourth- and fifth-grade students and presented in Tables 10, 11 and 12 respectively, do not support operational Hypothesis 4. Furthermore, the data obtained suggest an advantage accruing to fourth graders assigned to the SCC type of organization in the area of mathematics. At the third- and fifth-grade levels achievement test results do not reflect advantage for either the NGMATT nor the SCC form of organization.

Summary Academic Achievement Results

The results presented in Tables 1 through 12, respectively, indicate that pupil growth in the four academic areas of achievement examined (social studies, science, reading and mathematics) was statistically the same for the two groups of third-grade students.

The growth was the same for the fourth-grade students with the exception of mathematics. In this area of investigation the control group gained more than the experimental group. The growth between the experimental and control groups was the same for the fifth-grade students with the exception of social studies. In this case, again, the control students exceeded the experimental students.

Inspection and study of Tables 1 through 12 do not appear to represent a significant trend favoring either the NGMATT nor the SCC approach to academic achievement. At best, it appears, that students assigned to either type of organization can be expected to achieve academically in the conventional areas of the elementary school curriculum as well in one form of organization as in the other.

Creativity Test Results (Torrance)

Tables 13 through 24 represent the analysis of covariance scores for the area of creative thinking for the third-, fourth- and fifth-grade student study sample as measured by the Torrance Tests of Creative Thinking. Administration of the Torrance Tests of Creative Thinking produces scores in seven areas: Verbal Fluency, Verbal Flexibility, Verbal Originality, Figural Fluency, Figural Flexibility, Figural Originality and Figural Elaboration. Each table presented will feature a column indicating

the rejection or nonrejection of the null hypothesis in accordance with the experimental condition investigated in the present study. The adjusted group means for the experimental and control groups will be included in each table as well as a column indicating observed and critical "F" ratios.

An examination of Table 13 reveals that there is no significant difference between third-grade students in the control (Indian Hill) and experimental (Cook) schools in the area of verbal fluency. According to the author of the test, verbal fluency scores reflect the person's ability to produce a large number of ideas with words.

TABLE 13.--Analysis of covariance table for verbal fluency; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 10.06 $\bar{X}$ 38.00	N 11 S.D. 9.58 $\bar{X}$ 37.73	0.00		
Post-Test Score	N 10 S.D. 5.89 $\bar{X}$ 37.50	N 11 S.D. 6.11 $\bar{X}$ 34.55	1.27		
Adjusted Mean Score	$\bar{X}$ 37.10	$\bar{X}$ 34.91	0.84	4.41	Non-Reject

Table 14, the analysis of covariance table for verbal flexibility, likewise shows no significant difference between students instructed in the NGMATT or in the SCC plan. The null hypothesis is therefore non-rejected since the adjusted mean scores produce an observed "F" ratio below the alpha level of significance. Verbal flexibility scores represent a person's ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies.

TABLE 14.--Analysis of covariance table for verbal flexibility; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 10.06 $\bar{X}$ 38.00	N 11 S.D. 9.58 $\bar{X}$ 37.73	0.00		
Post-Test Score	N 10 S.D. 10.27 $\bar{X}$ 45.00	N 11 S.D. 9.86 $\bar{X}$ 40.45	1.07		
Adjusted Mean Score	$\bar{X}$ 44.91	$\bar{X}$ 40.54	1.52	4.41	Non-Reject

In Table 15, the third-grade scores are presented for the control and experimental school students for verbal originality. Verbal originality is the individual's ability to produce ideas that are away from

the obvious, commonplace, banal or the established. Here as in the previous two tests of creative thinking for third-grade students the null hypothesis was nonrejected because the adjusted mean scores did not produce a statistically significant difference between the groups.

TABLE 15.--Analysis of covariance table for verbal originality; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 5.16 $\bar{X}$ 39.00	N 11 S.D. 3.44 $\bar{X}$ 37.27	0.83		
Post-Test Score	N 10 S.D. 6.67 $\bar{X}$ 45.00	N 11 S.D. 6.36 $\bar{X}$ 41.36	1.64		
Adjusted Mean Score	$\bar{X}$ 44.52	$\bar{X}$ 41.80	0.95	4.41	Non-Reject

Table 16, the analysis of covariance table for the figural fluency portion of the Torrance Tests of Creative Thinking for third-grade students in the two schools compared in this study, is the first of two tests at the third-grade level that produced a statistically significant difference. As can be seen by an examination of the table, the Cook School students were

favored over the Indian Hill students, F (1,18) = 4.41, $p < .05$. Figural fluency is the person's ability to produce a large number of ideas with figures.

TABLE 16.--Analysis of covariance table for figural fluency; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 8.76 $\bar{X}$ 41.00	N 11 S.D. 7.69 $\bar{X}$ 39.09	0.28		
Post-Test Score	N 10 S.D. 5.87 $\bar{X}$ 42.00	N 11 S.D. 7.89 $\bar{X}$ 34.55	5.93		
Adjusted Mean Score	$\bar{X}$ 41.55	$\bar{X}$ 34.95	6.00	4.41	Reject

The third-grade tests for figural flexibility reflect no difference between the NGMATT and SCC plan of instruction when the analysis of covariance statistic is applied. Figural flexibility is the same as verbal flexibility (see Table 14) except that the concern is with figural rather than verbal modes of thinking.

Table 18 presents the mean scores on the pre- and post-test for figural originality on the Torrance Test of Creative Thinking for third-grade students from Cook and Indian Hill Schools and also the mean scores

TABLE 17.--Analysis of covariance table for figural flexibility; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 8.56 $\bar{X}$ 43.00	N 11 S.D. 7.83 $\bar{X}$ 43.18	0.00		
Post-Test Score	N 10 S.D. 9.14 $\bar{X}$ 46.50	N 11 S.D. 9.07 $\bar{X}$ 40.45	2.31		
Adjusted Mean Score	$\bar{X}$ 46.56	$\bar{X}$ 40.40	3.39	4.41	Non-Reject

TABLE 18.--Analysis of covariance table for figural originality; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 7.98 $\bar{X}$ 45.50	N 11 S.D. 10.00 $\bar{X}$ 45.00	0.02		
Post-Test Score	N 10 S.D. 18.07 $\bar{X}$ 51.00	N 11 S.D. 14.72 $\bar{X}$ 57.73	0.88		
Adjusted Mean Score	$\bar{X}$ 50.77	$\bar{X}$ 57.94	1.25	4.41	Non-Reject

as adjusted by the use of the analysis of covariance statistic. An examination of the table reveals an "F" ratio of 1.25 which is less than the "F" ratio necessary for significance at the .05 alfa level. Therefore, the null hypothesis is nonrejected. Figural Originality is the same as verbal originality except that the content is figural rather than verbal.

Table 19 is the second of seven sub-tests of the Torrance Tests of Creative Thinking for third-grade students that proved a statistically significant difference between Cook School and Indian Hill School students. The sub-test was for figural elaboration and the results again favored the Cook Students, $F\ (1,18) = 4.41\ (.05)$, $8.29\ (.01)$, $p < .01$. The figural elaboration score reflects the subject's ability to develop, embroider, embellish, carryout or elaborate ideas.

Table 20 is the first of seven tables that present the analysis of covariance sub-test results for fourth-grade students in the NGMATT and SCC plans on the Torrance Tests of Creative Thinking. The results of the verbal fluency sub-test presented in Table 20 is no difference between the two plans. The null hypothesis is therefore nonrejected. Verbal fluency is the ability to produce a large number of ideas with words.

A statistical comparison of the scores obtained by Cook and Indian Hill fourth-grade students for verbal

TABLE 19.--Analysis of covariance table for figural elaboration; Torrance Tests of Creative Thinking

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 10 S.D. 16.12 $\bar{X}$ 56.00	N 11 S.D. 12.06 $\bar{X}$ 58.64	0.18		
Post-Test Score	N 10 S.D. 5.37 $\bar{X}$ 48.00	N 11 S.D. 5.05 $\bar{X}$ 41.36	8.52		
Adjusted Mean Score	$\bar{X}$ 48.21	$\bar{X}$ 41.17	10.97	4.41(.05) 8.29(.01)	Reject

TABLE 20.--Analysis of covariance table for verbal fluency; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 3.78 $\bar{X}$ 32.50	N 8 S.D. 5.94 $\bar{X}$ 35.67	1.85		
Post-Test Score	N 15 S.D. 3.78 $\bar{X}$ 37.50	N 8 S.D. 4.58 $\bar{X}$ 37.33	0.01		
Adjusted Mean Score	$\bar{X}$ 38.29	$\bar{X}$ 36.91	0.59	4.35	Non-Reject

flexibility on the Torrance Tests of Creative Thinking reveals no significant difference. This means that the fourth-grade students from Cook School and the fourth-grade students from Indian Hill School performed equally well in the ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies. The null hypothesis is therefore nonrejected.

Results obtained on the sub-test for fourth-grade students from Indian Hill and Cook School for verbal originality, Torrance Tests of Creative Thinking are presented in Table 21. Verbal originality is the subject's ability to produce ideas that are away from the obvious, commonplace, banal, or the established. A review of Table 22 shows that the null hypothesis is non-rejected since the observed "F" ratio is below the alpha level of significance.

Table 23 is the analysis of covariance table for figural fluency, Torrance Test of Creative Thinking for fourth-grade students at Cook and Indian Hill elementary schools. The figural fluency score reflects the person's ability to produce a large number of ideas with figures. A review of the results of this sub-test shows that the Cook students were superior to the Indian Hill students, $F\ (1,20) = 4.35$, $p < .05$; the null hypothesis is therefore rejected.

TABLE 21.--Analysis of covariance table for verbal flexibility; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 7.53 $\bar{X}$ 38.13	N 8 S.D. 11.31 $\bar{X}$ 43.00	1.19		
Post-Test Score	N 15 S.D. 4.95 $\bar{X}$ 44.38	N 8 S.D. 7.76 $\bar{X}$ 44.33	0.00		
Adjusted Mean Score	$\bar{X}$ 45.46	$\bar{X}$ 43.76	0.38	4.35	Non-Reject

TABLE 22.--Analysis of covariance table for verbal originality; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 3.20 $\bar{X}$ 39.38	N 8 S.D. 3.27 $\bar{X}$ 40.00	0.19		
Post-Test Score	N 15 S.D. 3.54 $\bar{X}$ 43.75	N 8 S.D. 4.93 $\bar{X}$ 43.00	0.14		
Adjusted Mean Score	$\bar{X}$ 46.03	$\bar{X}$ 36.12	0.33	4.35	Non-Reject

TABLE 23.--Analysis of covariance table for figural fluency; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 4.96 $\bar{X}$ 34.38	N 8 S.D. 11.72 $\bar{X}$ 46.33	7.48		
Post-Test Score	N 15 S.D. 10.61 $\bar{X}$ 41.25	N 8 S.D. 10.77 $\bar{X}$ 38.67	0.30		
Adjusted Mean Score	$\bar{X}$ 46.03	$\bar{X}$ 36.12	4.65	4.35	Reject

Figural flexibility scores for fourth-grade test subjects in this study are presented in Table 24. As can be seen by analyzing the table, the null hypothesis of no difference cannot be rejected since the observed "F" ratio falls short of statistical significance at the .05 alpha level. The figural flexibility score represents a person's ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies.

In Table 25 it is noted that the null hypothesis of no difference between NGMATT and the SCC was statistically significant beyond the .05 level, $F(1,20) = 4.35$, $p < .05$. Support, as reflected by the data of Table 25 appears to favor fourth-grade children assigned to the

TABLE 24.--Analysis of covariance table for figural flexibility; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 5.35 $\bar{X}$ 40.00	N 8 S.D. 11.41 $\bar{X}$ 49.67	5.06		
Post-Test Score	N 15 S.D. 12.25 $\bar{X}$ 45.00	N 8 S.D. 10.86 $\bar{X}$ 45.00	0.00		
Adjusted Mean Score	$\bar{X}$ 48.51	$\bar{X}$ 43.13	1.17	4.35	Non-Reject

TABLE 25.--Analysis of covariance table for figural originality; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 5.63 $\bar{X}$ 35.62	N 8 S.D. 12.65 $\bar{X}$ 53.00	13.44		
Post-Test Score	N 15 S.D. 21.70 $\bar{X}$ 61.88	N 8 S.D. 11.93 $\bar{X}$ 49.33	3.26		
Adjusted Mean Score	$\bar{X}$ 67.61	$\bar{X}$ 46.28	6.21	4.35	Reject

NGMATT in the area of figural originality. As indicated in the table, the null hypothesis is rejected in this particular case. It will be recalled that figural originality is the same as verbal originality except that the content is figural rather than verbal.

Table 26 presents the data obtained from the fourth grade test subjects in the sub-test area of figural elaboration; Torrance Test of Creative Thinking. Figural elaboration is the subject's ability to develop, embroider, embellish, carry out or elaborate ideas. A review of Table 26 reveals no statistical difference between the two groups of test subjects and thus the null hypothesis is not rejected.

TABLE 26.--Analysis of covariance table for figural elaboration; Torrance Tests of Creative Thinking

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 15 S.D. 6.78 $\bar{X}$ 60.63	N 8 S.D. 11.16 $\bar{X}$ 52.67	3.36		
Post-Test Score	N 15 S.D. 3.78 $\bar{X}$ 45.00	N 8 S.D. 7.02 $\bar{X}$ 42.00	1.25		
Adjusted Mean Score	$\bar{X}$ 43.88	$\bar{X}$ 42.60	0.21	4.35	Non-Reject

Table 27 is the first of seven tables which present data obtained from the administration of the complete battery of the Torrance Tests of Creative Thinking to a random sampling of the fifth-grade test subjects. In the area of verbal fluency, the ability to produce a large number of ideas with words, Table 27 shows no significant difference between test subjects. Therefore, the null hypothesis is nonrejected.

TABLE 27.--Analysis of covariance table for verbal fluency; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 7.15 $\bar{X}$ 42.00	N 10 S.D. 4.83 $\bar{X}$ 36.25	5.04		
Post-Test Score	N 12 S.D. 6.43 $\bar{X}$ 44.50	N 10 S.D. 5.44 $\bar{X}$ 37.50	7.66		
Adjusted Mean Score	$\bar{X}$ 42.10	$\bar{X}$ 39.50	2.01	4.38	Non-Reject

Table 28 presents the results obtained for the creative thinking area of verbal flexibility. The adjusted mean score presented reflects a statistically significant difference in favor of the experimental school fifth-grade students at the .05 alpha level. It

appears from the data, therefore, that students in the NGMATT program are superior to SCC students in their ability to produce a variety of kinds of ideas, to shift from one approach to another, or to use a variety of strategies.

TABLE 28.--Analysis of covariance table for verbal flexibility; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 9.37 $\bar{X}$ 51.00	N 10 S.D. 7.11 $\bar{X}$ 46.25	1.83		
Post-Test Score	N 12 S.D. 8.96 $\bar{X}$ 54.50	N 10 S.D. 10.97 $\bar{X}$ 42.08	8.22		
Adjusted Mean Score	$\bar{X}$ 52.72	$\bar{X}$ 43.56	5.64	4.38	Reject

Again in Table 29 the null hypothesis must be rejected since a statistical difference in test scores between a sample of fifth-grade children from Cook School and Indian Hill School was obtained. In this instance, the results are highly significant, $F(1,19) = 4.38$ (.05), 8.18 (.01), $P < .01$. The results of this subtest for verbal originality tends to support the conclusion that Cook School fifth-grade subjects are

superior to Indian Hill fifth-grade subjects in the ability to produce ideas that are away from the obvious, commonplace, banal or established.

TABLE 29.--Analysis of covariance table for verbal originality; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 2.42 $\bar{X}$ 41.50	N 10 S.D. 5.64 $\bar{X}$ 45.00	3.32		
Post-Test Score	N 12 S.D. 7.98 $\bar{X}$ 50.50	N 10 S.D. 6.89 $\bar{X}$ 42.08	7.05		
Adjusted Mean Score	$\bar{X}$ 51.41	$\bar{X}$ 41.32	9.02	4.38(.05) 8.18(.01)	Reject

A review of Table 30 will reveal that the "no difference" null form of the hypothesis was nonrejected as a result of the lack of statistical significance at the specified alpha level. Here, the adjusted mean score produces no evidence that lends support to the approach of either the NGMATT or the SCC in the area of figural fluency for children in the fifth grade.

Table 31 affords a visual representation of the analysis of covariance data information for the figural flexibility test results; Torrance Tests of Creative Thinking.

TABLE 30.--Analysis of covariance table for figural fluency; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 6.24 $\bar{X}$ 45.00	N 10 S.D. 7.53 $\bar{X}$ 45.42	0.02		
Post-Test Score	N 12 S.D. 3.54 $\bar{X}$ 42.50	N 10 S.D. 8.91 $\bar{X}$ 40.42	0.48		
Adjusted Mean Score	$\bar{X}$ 42.61	$\bar{X}$ 40.32	0.72	4.38	Non-Reject

TABLE 31.--Analysis of covariance table for figural flexibility; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 7.45 $\bar{X}$ 50.00	N 10 S.D. 8.21 $\bar{X}$ 50.83	0.06	4.38	
Post-Test Score	N 12 S.D. 4.83 $\bar{X}$ 48.00	N 10 S.D. 7.53 $\bar{X}$ 44.58	1.53		
Adjusted Mean Score	$\bar{X}$ 48.11	$\bar{X}$ 44.49	1.79	4.38	Non-Reject

The null hypothesis is clearly nonrejected as the adjusted mean scores of the study groups fail to achieve differences that are statistically significant at the .05 level.

This condition does not therefore indicate superiority for either the NGMATT or the SCC approach in the area of figural flexibility for fifth-grade students.

In Table 32 as in the previous table results obtained do not reflect a difference that is statistically significant.

TABLE 32.--Analysis of covariance table for figural originality; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 8.64 $\bar{X}$ 50.50	N 10 S.D. 10.94 $\bar{X}$ 46.67	0.81		
Post-Test Score	N 12 S.D. 18.11 $\bar{X}$ 66.50	N 10 S.D. 15.57 $\bar{X}$ 56.67	1.88		
Adjusted Mean Score	$\bar{X}$ 65.62	$\bar{X}$ 57.40	1.28	4.38	Non-Reject

The conclusion is therefore reached that neither the fifth-grade students from the NGMATT or SCC approach

is superior to the other in the ability to produce ideas that are away from the obvious, commonplace, banal or the established.

The null hypothesis is nonrejected in this instance.

Table 33 presents the data of scores obtained for students in the two schools used in this study.

TABLE 33.--Analysis of covariance table for figural elaboration; Torrance Tests of Creative Thinking

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 12 S.D. 15.99 $\bar{X}$ 63.50	N 10 S.D. 11.57 $\bar{X}$ 57.92	0.90		
Post-Test Score	N 12 S.D. 10.59 $\bar{X}$ 47.00	N 10 S.D. 8.12 $\bar{X}$ 47.50	0.02		
Adjusted Mean Score	$\bar{X}$ 45.84	$\bar{X}$ 48.47	0.58	4.38	Non-Reject

It is noted that here again, no difference between the test scores of fifth graders is obtained when the analysis of covariance statistic is applied.

The null hypothesis is therefore nonrejected since neither fifth-grade group scores demonstrated a

superiority in the ability to develop, embroider, embellish, carry out or elaborate ideas.

Summary of Data for the Torrance Tests of Creative Thinking of Third-, Fourth- and Fifth-Grade Student Study Sample

The results for the third, fourth and fifth grades on the creative thinking tests tended to favor the experimental school. This statement is supported by the fact that in six of the twenty-one areas reported, experimental school students produced scores that were statistically significant; in addition, a pattern of superior performance can be seen in the areas of verbal flexibility and verbal originality from grade three through grade five.

The results of the Torrance Tests of Creative Thinking suggests support for Hypothesis 5 which states:

Hypothesis 5:

> Pupils in the NGMATT plan will demonstrate higher levels of creative thinking ability, as measured by the Torrance Tests of Creative Thinking, than will pupils who have been taught by a single teacher in the SCC plan.

Self-Concept and Motivation Inventory (Scamin) Results

Tables 35 through 47 and Figures 1 and 2 represent the analysis of covariance scores for the areas of the self-concept and motivation for the third-, fourth- and fifth-grade student study sample as measured by the

TABLE 34.--Adapted analysis of covariance table for the Torrance Tests of Creative Thinking

		Grades Three, Four, Five					
		Grade 3		Grade 4		Grade 5	
Verbal Fluency	Ex.	37.1	N.S.	38.3	N.S.	42.1	N.S.
	Con.	34.9		36.9		39.5	
Verbal Flexibility	Ex.	44.9	N.S.	45.5	N.S.	52.7	.05
	Con.	40.5		43.8		43.6	
Verbal Originality	Ex.	44.5	N.S.	44.0	N.S.	51.4	.01
	Con.	41.8		42.9		41.3	
Figural Fluency	Ex.	41.6	.05	46.0	.05	42.6	N.S.
	Con.	35.0		36.1		40.3	
Figural Flexibility	Ex.	46.6	N.S.	48.5	N.S.	48.1	N.S.
	Con.	40.4		43.1		44.5	
Figural Originality	Ex.	50.8	N.S.	67.6	.05	65.6	N.S.
	Con.	57.9		46.3		57.4	
Figural Elaboration	Ex.	48.2	.05	43.9	N.S.	45.8	N.S.
	Con.	41.2		42.6		48.5	

N.S. = Not Significant; .05 = Significant; .01 = Highly Significant

SCAMIN. Administration of the SCAMIN profile produces scores in four areas: Goal and Achievement Needs, Failure Avoidance, Role Expectations and Self-Adequacy. Each table presented will feature a column indicating the rejection or nonrejection of the null hypothesis in accordance with the experimental condition investigated in the present study. The adjusted group means for the experimental and control groups will be included in each table as well as columns indicating observed and critical "F" ratios.

Table 35 depicts the goal/achievement needs for third graders as measured by the "Motivation" section of the SCAMIN profile.

The null (Ho) column in Table 35 indicates that the effect of the experimental condition investigated in the present study was nonrejected at the .05 level of significance. The adjusted mean score for the experimental group is 50.98 and for the control group it is 51.18.

In the sub-category of motivation described as "Failure Avoidance," the statistical condition reflected by Table 36 indicates a rejection of the no difference null hypothesis associated with the experimental variable investigated. The adjusted mean score of 47.83 for the experimental Cook School students reflects support for the NGMATT approach in the area of motivation for learning of third-grade students.

TABLE 35.--Analysis of covariance table for goal/achievement needs; self-concept and motivation inventory (SCAMIN)

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 86 S.D. 5.26 $\bar{X}$ 50.88	N 64 S.D. 4.11 $\bar{X}$ 53.81	13.62		
Post-Test Score	N 86 S.D. 5.12 $\bar{X}$ 50.34	N 64 S.D. 4.03 $\bar{X}$ 52.05	4.88		
Adjusted Mean Score	$\bar{X}$ 50.98	$\bar{X}$ 51.18	0.09	3.84	Non-Reject

TABLE 36.--Analysis of covariance table for failure avoidance self-concept and motivation inventory (SCAMIN)

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Scores	N 86 S.D. 5.02 $\bar{X}$ 48.49	N 64 S.D. 5.57 $\bar{X}$ 46.55	5.00		
Post-Test Scores	N 86 S.D. 4.75 $\bar{X}$ 48.24	N 64 S.D. 5.55 $\bar{X}$ 45.78	8.53		
Adjusted Mean Scores	$\bar{X}$ 47.83	$\bar{X}$ 46.34	4.10	3.84	Reject

In the area of the self-concept the SCAMIN profile is sub-divided in two sections: role expectations and self-adequacy. Table 37 presents the data obtained from the sub-section of role expectations for third-grade students.

TABLE 37.--Analysis of covariance table for role expectations; self-concept and motivation inventory (SCAMIN)

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 86 S.D. 6.21 $\bar{X}$ 46.44	N 64 S.D. 5.28 $\bar{X}$ 47.56	1.35		
Post-Test Score	N 86 S.D. 6.37 $\bar{X}$ 43.80	N 64 S.D. 4.68 $\bar{X}$ 47.95	19.39		
Adjusted Mean Score	$\bar{X}$ 43.98	$\bar{X}$ 47.72	18.02	3.84(.05) 6.63(.01)	Reject

It is noted in Table 37 that a comparison of the adjusted mean scores of experimental and control groups indicate a statistical advantage favoring the control Indian Hill students beyond the .01 level of confidence. Thus the null hypothesis stating that no difference will prevail between groups is rejected.

The statistical condition described in connection with the previous Table 37 again prevails in the case of

Table 38. That is the null hypothesis of no difference between experimental third graders and control group children in the sub-category of "Self-Adequacy" is rejected in the area of the self-concept. The adjusted mean score of 44.05 reflects superiority for the SCC approach in this category of assessment.

TABLE 38.--Analysis of covariance table for self-adequacy; self-concept and motivation inventory (SCAMIN)

	Grade Three				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 86 S.D. 6.07 $\bar{X}$ 42.02	N 64 S.D. 6.30 $\bar{X}$ 43.77	2.92		
Post-Test Score	N 86 S.D. 7.36 $\bar{X}$ 41.52	N 64 S.D. 5.55 $\bar{X}$ 44.59	7.83		
Adjusted Mean Score	$\bar{X}$ 41.93	$\bar{X}$ 44.05	4.89	3.84	Reject

The goal/achievement needs between experimental fourth-grade students and control-group students do not appear to differ in a manner that is statistically significant as demonstrated by data in Table 39. It follows then that the null hypothesis stating: There are no differences in the adjusted mean score of the NGMATT and SCC groups, is nonrejected.

TABLE 39.--Analysis of covariance table for goal/achievement needs; self-concept and motivation inventory (SCAMIN)

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 96 S.D. 4.64 $\bar{X}$ 49.33	N 61 S.D. 5.08 $\bar{X}$ 51.25	5.89		
Post-Test Score	N 96 S.D. 4.88 $\bar{X}$ 48.15	N 61 S.D. 6.36 $\bar{X}$ 50.46	6.59		
Adjusted Mean Score	$\bar{X}$ 48.60	$\bar{X}$ 49.74	2.15	3.84	Non-Reject

Data presented in Table 40 depict a statistically significant superiority for children in the fourth grade and assigned to NGMATT in the motivation sub-category of failure avoidance. The rejection of the no difference null hypothesis is based upon a relationship of the adjusted mean scores that exceeds a level of confidence of .01.

In the self-concept sub-category of role expectations control group students responded to the test instrument in a manner that demonstrated a statistical advantage for the SCC arrangement. In this case the null hypothesis was rejected at a level beyond the .01 element of confidence.

TABLE 40.--Analysis of covariance table for failure avoidance; self-concept and motivation inventory (SCAMIN)

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 96 S.D. 4.53 $\bar{X}$ 46.05	N 61 S.D. 5.17 $\bar{X}$ 46.18	0.03		
Post-Test Score	N 96 S.D. 6.25 $\bar{X}$ 46.41	N 61 S.D. 6.45 $\bar{X}$ 43.82	6.24		
Adjusted Mean Score	$\bar{X}$ 46.43	$\bar{X}$ 43.78	8.04	3.84(.05) 6.63(.01)	Reject

Fourth graders' feelings of self-adequacy were not found to differ in a manner that was statistically significant between the NGMATT and SCC groups. Thus it appears that each approach tends to enhance feelings of personal worth equally well.

In Table 43 it is noted that the null hypothesis of no difference between experimental and control group fifth graders is not rejected in the category of goal/ achievement needs.

The adjusted mean scores for NGMATT and SCC fifth-grade students fail to reach a level of difference that is statistically significant at the .05 alpha requirement. It is noted in Table 44 that the null hypothesis is not rejected as was the case in Table 43. Thus in the

TABLE 41.--Analysis of covariance table for role expectations; self-concept and motivation inventory (SCAMIN)

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 96 S.D. 4.81 $\bar{X}$ 44.68	N 61 S.D. 5.01 $\bar{X}$ 46.39	4.60		
Post-Test Score	N 96 S.D. 5.27 $\bar{X}$ 42.96	N 61 S.D. 6.01 $\bar{X}$ 46.31	13.53		
Adjusted Mean Score	$\bar{X}$ 43.34	$\bar{X}$ 45.71	8.74	3.84(.05) 6.63(.01)	Reject

TABLE 42.--Analysis of covariance table for self-adequacy; self-concept and motivation inventory (SCAMIN)

	Grade Four				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 96 S.D. 4.48 $\bar{X}$ 40.91	N 61 S.D. 5.31 $\bar{X}$ 43.70	12.57		
Post-Test Score	N 96 S.D. 5.32 $\bar{X}$ 40.27	N 61 S.D. 6.01 $\bar{X}$ 43.34	11.24		
Adjusted Mean Score	$\bar{X}$ 41.01	$\bar{X}$ 42.17	2.25	3.84	Non-Reject

TABLE 43.--Analysis of covariance table for goal/achievement needs; self-concept and motivation inventory (SCAMIN)

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 108 S.D. 5.39 $\bar{X}$ 48.27	N 64 S.D. 4.47 $\bar{X}$ 49.95	4.44		
Post-Test Score	N 108 S.D. 6.05 $\bar{X}$ 46.59	N 64 S.D. 6.22 $\bar{X}$ 47.55	0.98		
Adjusted Mean Score	$\bar{X}$ 47.06	$\bar{X}$ 46.76	0.14	3.84	Non-Reject

TABLE 44.--Analysis of covariance table for failure avoidance; self-concept and motivation inventory (SCAMIN)

	Grade Five				
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 108 S.D. 5.76 $\bar{X}$ 47.22	N 64 S.D. 4.34 $\bar{X}$ 45.03	6.92		
Post-Test Score	N 108 S.D. 7.35 $\bar{X}$ 45.99	N 64 S.D. 6.07 $\bar{X}$ 43.62	4.72		
Adjusted Mean Score	$\bar{X}$ 45.46	$\bar{X}$ 44.52	0.95	3.84	Non-Reject

general category of fifth-grade motivation for learning, it appears that no statistical advantage can be established as a rationale favoring either the NGMATT plan nor the SCC approach.

The role expectations of fifth-grade students, as measured by the SCAMIN do not provide data that results in differences of adjusted mean scores that are statistically significant. Thus as presented in Table 45 the null hypothesis associated with this sub-category of the self-concept is not rejected.

TABLE 45.--Analysis of covariance table for role expectations; self-concept and motivation inventory (SCAMIN)

	Grade Five				
	Cook School	Indian Hill School	Adjusted "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 108 S.D. 5.49 $\bar{X}$ 43.03	N 64 S.D. 4.82 $\bar{X}$ 46.28	15.43		
Post-Test Score	N 108 S.D. 5.13 $\bar{X}$ 42.26	N 64 S.D. 6.10 $\bar{X}$ 43.69	2.70		
Adjusted Mean Score	$\bar{X}$ 42.97	$\bar{X}$ 42.49	0.41	3.84	Non-Reject

As described in connection with the previous Table 45 data presented in Table 46 suggests no superiority for either the NGMATT nor the SCC approach for fostering

TABLE 46.--Analysis of covariance table for self-adequacy; self-concept and motivation inventory (SCAMIN)

	Grade Five					
	Cook School	Indian Hill School	Observed "F" Ratio	Critical "F" Ratio	Null Hypothesis (Ho)
Pre-Test Score	N 108 S.D. 5.31 $\bar{X}$ 40.56	N 64 S.D. 4.84 $\bar{X}$ 43.25	11.03		
Post-Test Score	N 108 S.D. 6.19 $\bar{X}$ 40.41	N 64 S.D. 6.03 $\bar{X}$ 42.17	3.33		
Adjusted Mean Score	$\bar{X}$ 41.09	$\bar{X}$ 41.03	0.00	3.84	Non-Reject

greater feelings of self-adequacy on the part of fifth-grade students. The null hypothesis is not rejected on the basis of the data reflected in Table 46.

Summary of Data for the Self-Concept and Motivation of Third-, Fourth- and Fifth-Grade Student Study Sample

As indicated in Table 47, the students assigned to the experimental NGMATT plan exhibited a consistently significant advantage over the control group students in the sub-category of failure avoidance (Motivation, Part II).

The source of the previously noted difference was derived from test items describing the avoidance of failure, the students' acknowledging of their responsibility for academic achievement, and their personal

TABLE 47.--Adapted analysis of covariance table for the self-concept and motivation inventory

Grades	School	Motivation		Self-Concept	
		Part I	Part II	Part III	Part IV
Third	Non-graded	51.0	47.8[a]	44.0	41.9
	Control	51.2	46.3	47.7[b]	44.1[a]
Fourth	Non-graded	48.6	46.4[b]	43.3	41.1
	Control	49.7	43.8	45.7[b]	42.2
Fifth	Non-graded	47.1	45.5	43.0	41.1
	Control	46.8	44.5	42.5	41.0

[a]Significant at .05 level

[b]Significant at .01 level

Scores over 40 are normatively considered to be positive for self-concept. Over 44 is positive for motivation.

academic investment ("It matters!"). According to the authors of SCAMIN, Part II of the instrument is the most predictive factor of academic success in all of the SCAMIN studies they have conducted.

Figure 1 represents an extraction of the data from Table 47 dealing only with the self-concept (Role expectations). The data are presented in the form of a graph to illustrate more clearly the phenomenon to be noted.

Although the scores of third grade, 47.7, and fourth grade, 45.7, are both statistically significant in favor of the control students represented by the dotted line in Figure 1, the consistency of the solid

line scores across the three grades for experimental school students represents a more positive value. It is observed in Figure 1 that at the fifth grade the declining score in role expectations for control students is surpassed by the more constant scores of the experimental school students by grade five.

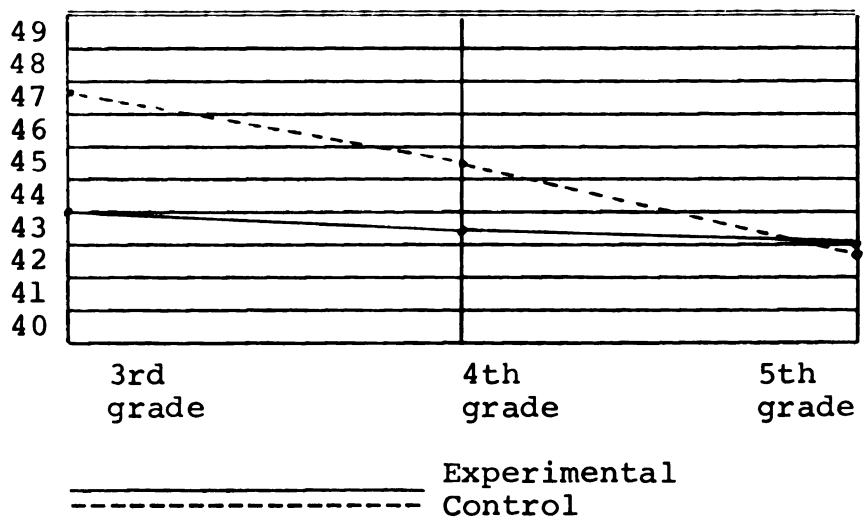

Figure 1.--Self-concept--Part III (Role Expectations).

Figure 2 represents an extraction of the data from Table 47 dealing only with the self-adequacy (Part IV) part of the self-concept.

As noted in Figure 2, a national pattern of a drop in self-adequacy is reflected by the dotted line scores of the control students. This decline in self-adequacy is not present in the more constant solid line scores for the experimental school students. Self-adequacy is the positive regard with which a student

views his present and future probabilities of success. It is observed from Figure 2 that the experimental school students were stable on the "I can do" self-adequacy factor across grade levels and this was not the case in the control scores.

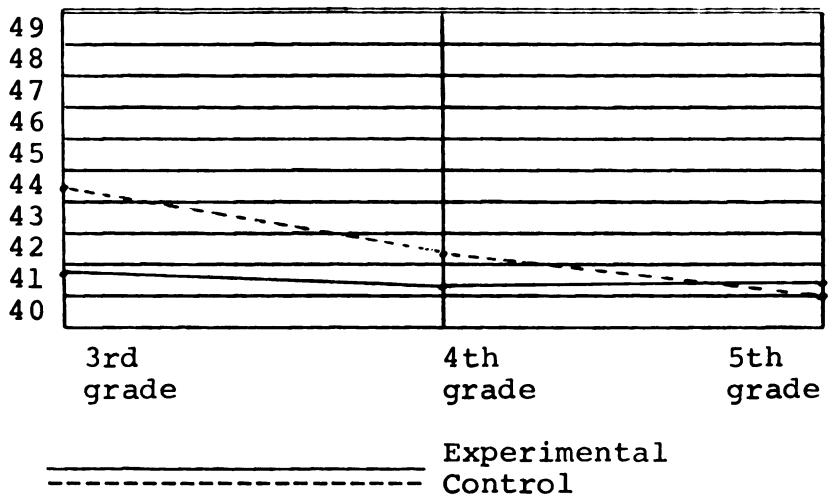

Figure 2.--Self-concept--Part IV (Self-Adequacy).

It is noted in both Figures 1 and 2 that the self-concepts were positive for both the experimental and control students. (Scores of forty are considered to be positive in the area of the self-concept.)

An interpretation of the data derived from the section, "Erratic Profile Types" in the SCAMIN Manual of Interpretation suggests that: In a relatively short period of time the important motivational investment of students in the NGMATT plan became more positive than that of the students in the SCC organization. The

self-concept, although positive and more stable for the experimental group, showed a higher roll expectations score (Table 47, Part III, Self-Concept) for the middle grades of the control school. No evidence of unhealthy anxiety was found for either the NGMATT students nor the SCC students inventoried.

Although the statistical results obtained from the SCAMIN do not lend support for operational Hypothesis 6, neither do the results lend support for rejecting this hypothesis which states:

Hypothesis 6:

> Pupils in the NGMATT plan will exhibit more positive feelings about self and demonstrate higher levels of motivation for learning, as measured by the Self-Concept and Motivation Inventory, than will pupils who have been taught by a single teacher in the SCC plan.

Rather, the interpretation of the inter-related association of the data obtained by the SCAMIN suggests the tendency to lend support to the NGMATT program in the category of the self-concept.

Attitude Survey Results

As was suggested in Chapter I of the present study, one of the original purposes of the study was to evaluate the attitudes of the teachers and the parents of students participating in the NGMATT and SCC forms of school organization.

To achieve this objective, a bank of attitude data was obtained by employing instruments designed for this purpose. An education scale for teachers, a teacher attitude scale and a parent attitude scale were used as the instruments for gathering attitudinal data. In Chapter IV the attitude data employed will be related to the specific operational hypothesis presented in Chapter I of the present study.

Teacher Attitude Scale

Operational Hypothesis 7 states that:

Hypothesis 7:

Teachers in the NGMATT plan will report a more favorable attitude toward their job, as measured by a locally prepared instrument, than teachers who teach in a SCC plan.

Apparent support for the hypothesis may be identified in the response of experimental and control group teachers to specific questions illustrated in Table 48.

The response to question number one in Table 48 indicates that the experimental school teachers are extremely familiar with the NGMATT Plan since 96 per cent of them understood the plan either "quite fully" or "fairly well," however, only 31 per cent of the control school teachers know the NGMATT Plan "fairly well" and 38 per cent "know it partially." The

TABLE 48.--Teacher attitude scale (percentage of responses in individual categories; control N = 13; experimental N = 24)

Question 1					
Your attitudes about the Non-Graded Multi-Age Team Teaching Plan (NGMATT) may be uncertain because you don't know all the details of the plan. Check below how well you feel you know the plan.	Know It Quite Fully	Know It Fairly Well	Know It Partially	Much I Don't Know About I	Know Very Little About It
Teachers in SCC Plan	-	31	38	23	8
Teachers in NGMATT Plan	79	17	4		
Question 2					
Indicate your overall reaction to your present teaching assignment as a way of conducting elementary education.	Strongly Opposed	Moderately Opposed	Don't Care Either Way	Moderately In Favor	Strongly In Favor
Teachers in SCC Plan	15			38	46
Teachers in NGMATT Plan					100
Question 3					
Indicate your feelings about the amount of emphasis that current teaching in your school assignment places on each of the following subjects. Check opposite each subject.	Far Too Much	Somewhat Too Much	About Right	Somewhat Too Little	Far Too Little

TABLE 48.--Continued.

Question 3	Far Too Much	Somewhat Too Much	About Right	Somewhat Too Little	Far Too Little
Teachers in SCC Plan			100		
Language Arts					
Teachers in NGMATT Plan			100		
Teachers in SCC Plan			100		
Mathematics					
Teachers in NGMATT Plan			92	8	
Teachers in SCC Plan			42	58	
Arts and Crafts					
Teachers in NGMATT Plan		13	70	17	
Teachers in SCC Plan			75	17	8
Physical Education					
Teachers in NGMATT Plan			83	13	4
Teachers in SCC Plan		8	50	42	
Science					
Teachers in NGMATT Plan			58	38	4
Teachers in SCC Plan			83	17	
Social Studies					
Teachers in NGMATT Plan	4		79	17	
Teachers in SCC Plan			83	17	
Music					
Teachers in NGMATT Plan			87	13	

TABLE 48.--Continued.

Question 4					
How well does teaching in your school assignment provide for academic learning by pupils of different levels of ability? Indicate your feelings by checking opposite each group of pupils.	Provides Excep-tionally Well	Provides Ade-quately	Provides Inade-quately	Provides Quite Poorly	Don't Know
Teachers in SCC Plan Gifted Pupils		77	15	8	
Teachers in NGMATT Plan	92	4	4		
Teachers in SCC Plan Average Pupils	31	69			
Teachers in NGMATT Plan	67	29	4		
Teachers in SCC Plan Slow Learners					
Teachers in NGMATT Plan	63	25	4	8	

Question 5					
Indicate how well you feel your present teaching assign-ment permits you to meet emotional needs of pupils generally.	Provides Very Well	Provides Well	Pupils Will Manage	Provides Poorly	Provides Very Badly
Teachers in SCC Plan	58	33	8		
Teachers in NGMATT Plan	38	54	8		

TABLE 48.--Continued.

Question 6					
Indicate how well you feel your school assignment provides for reporting to parents and for conferences with parents.	Provides Very Badly	Provides Poorly	Provides Acceptably	Provides Well	Provides Very Well
Teachers in SCC Plan		38	46	8	8
Teachers in NGMATT Plan	17	29	29	13	13
Question 7					
Check how well you feel your school assignment provides for conducting nonclassroom activities (assemblies, band, library, field trips, etc.)	Provides Very Well	Provides Well	Provides Acceptably	Provides Poorly	Provides Very Badly
Teachers in SCC Plan		38	46	15	
Teachers in NGMATT Plan	42	21	21	13	4
Question 8					
If you were to teach, or do teach, in the NGMATT Plan, indicate your feeling regarding teachers instructing children in all subject areas.	Strongly Opposed	Moderately Opposed	Don't Care Either Way	Moderately In Favor	Strongly In Favor
Teachers in the SCC Plan		25	17	42	17
Teachers in the NGMATT Plan			9	26	65

TABLE 48.--Continued.

Question 9					
Under present circumstances demands on teacher time and energy are:	Very Excessive	Somewhat Excessive	About Average	Less Than Usual	Much Less Than Usual
Teachers in the SCC Plan		15	69	15	
Teachers in the NGMATT Plan	33	46	21		
Question 10					
Indicate your feelings about taking part in this research project.	Strongly In Favor	Moderately In Favor	Don't Care Either Way	Moderately Opposed	Strongly Opposed
Teachers in the SCC Plan	23	31	23	8	15
Teachers in the NGMATT Plan	79	17	4		
Question 11					
What reactions do you have to your present teaching assignment as compared to previous years?	Much Better	Somewhat Better	About the Same	Not Quite As Well	Not Nearly As Well
Teachers in the SCC Plan	50	20	30		
Teachers in the NGMATT Plan	91	4	4		
Question 12					
How well does your teaching assignment provide opportunity for integration of subject matter teaching?	Very Poorly	Somewhat Poorly	Neither Poorly or Well	Fairly Well	Very Well

TABLE 48.--Continued.

Question 12	Very Poorly	Somewhat Poorly	Neither Poorly or Well	Fairly Well	Very Well
Teachers in the SCC Plan		8		62	31
Teachers in the NGMATT Plan				8	92
Question 13					
How well does your present teaching assignment provide for professional growth activities?	Very Well	Well Enough	Moderately	Poor	Very Poorly
Teachers in the SCC Plan	15	15	46	15	8
Teachers in the NGMATT Plan	38	4	33	13	13
Question 14					
How well do you feel the NGMATT Plan provides for meeting the emotional needs of the following groups of children?	Don't Know	Provides Quite Poorly	Provides Inade-quately	Provides Ade-quately	Provides Excep-tionally Well
Teachers in the SCC Plan Third Grade	69	0	8	15	8
Teachers in the NGMATT Plan	13	0	4	13	71
Teachers in the SCC Plan Fourth Grade	69	0	0	23	8
Teachers in the NGMATT Plan	8	0	0	21	71

TABLE 48.--Continued.

Question 14	Don't Know	Provides Quite Poorly	Provides Inade-quately	Provides Ade-quately	Provides Excep-tionally Well
Teachers in the SCC Plan Fifth Grade	69	8	0	15	8
Teachers in the NGMATT Plan	13	0	0	4	83
Question 15 (a)					
What effect do you feel teaching in the modified self-contained classroom has on the frequency of discipline problems? Please respond to 15a and 15b. Under this plan, such problems are:	Much Less Frequent	Somewhat Frequent	About As Frequent	Somewhat More Frequent	Much More Frequent
Teachers in the SCC Plan	30	20	50	0	0
Teachers in the NGMATT Plan	0	9	45	36	9
Question 15 (b)					
What effect do you feel teaching in the NGMATT Plan has on the frequency of discipline problems? Under this plan, such problems are:	Much Less Frequent	Somewhat Frequent	About As Frequent	Somewhat More Frequent	Much More Frequent
Teachers in the SCC Plan	10	0	50	20	20
Teachers in the NGMATT Plan	29	42	25	4	0

TABLE 48.--Continued.

Question 16 (a)		
If you were given the opportunity, would you prefer to teach in the self-contained classroom plan?	Yes	No
Teachers in the SCC Plan	82	18
Teachers in the NGMATT Plan	4	96
Question 16 (b)		
If you were given the opportunity, would you prefer to teach in the NGMATT Plan?	Yes	No
Teachers in the SCC Plan	60	40
Teachers in the NGMATT Plan	100	

relevance of these findings is to establish whether most teachers responding to the questionnaire items in the present study were reacting on the basis of a stated understanding of the NGMATT plan.

Fifteen per cent of the teachers assigned to the SCC plan responding to question number two indicated that they were "Strongly Opposed" to their present teaching assignment and another 38 per cent were "Moderately in Favor," while none of the teachers in the NGMATT plan indicated opposition in this category, 100 per cent were "Strongly in Favor."

The perceptions of both groups of teachers, as shown by their response to question three, seems to indicate that about the right amount of emphasis is being spent on the various school subjects in both schools. The one exception was in the area of arts and crafts. Many teachers in the SCC plan perceived somewhat too little emphasis in this subject.

When asked about their perceptions about the provision for "academic learning" of gifted, average, and slow learners, the teachers in the NGMATT plan responded more positively than those in the SCC plan. Ninety-six per cent of the experimental school teachers felt that the gifted pupil is either provided for "exceptionally well" or "adequately" while only 77 per cent of the control school teachers felt their

assignment provided "adequately" for the gifted. For the average pupil, 96 per cent of the experimental school teachers and 100 per cent of the control school teachers felt their teaching assignment provided either "exceptionally well" or "adequately." A closer examination of the responses, however, reveals that 77 per cent of the experimental school teachers compared to 31 per cent of the control school teachers felt the provision for average pupils was provided for "exceptionally well." In the instance of slow learners, 88 per cent of the experimental school teachers contrasted with 69 per cent of the control school teachers perceived their assignment either providing "exceptionally well" or "adequately" for their academic learning.

Teachers in both the control and experimental schools feel that their teaching assignment provides either "very well" or "well" for the emotional needs of pupils; 92 per cent of the control and 91 per cent of the experimental teachers responded in these two categories. Again, a closer examination of the responses would seem to indicate a more positive response from experimental school teachers since 58 per cent as contrasted with 38 per cent of the control school teachers felt emotional needs were provided for "very well."

Experimental school teachers tend to feel that their situation is better, when compared to control school teachers, for conducting nonclassroom activities. This conclusion is based upon the data obtained from teacher responses to question number seven.

In question eight, teachers in the present study were asked to express their feeling regarding teachers instructing children in all subject areas. Experimental school teachers tend to be more strongly in favor of instructing children in all subject areas with 65 per cent responding "strongly in favor" compared to only 17 per cent of the control school teachers.

Attitudes of both the control group and experimental group teachers toward their respective roles in the present study was obtained by response to question number ten. To this question, 96 per cent of the experimental school teachers indicated they were "strongly in favor," or "moderately in favor" of taking part in the research project. A combined percentage of 54 per cent of the control school teachers affirmed their interest as research project participants in identical categories. Results obtained indicate that slightly more than half the control, and nearly all of the experimental group teachers involved in the present study reflected a positive attitude toward their participation.

When queried about reactions to the teaching assignment at the time of the study effort in contrast to the assignment of prior years, results obtained represent a supportive pattern for operational Hypothesis 7. To question number eleven, 91 per cent of the experimental teachers indicated that their reactions to their present assignment as compared with previous years were "much better." This response is in contrast to 50 per cent of the control school teachers who felt the same way.

The provision for opportunity for integration of subject matter teaching was investigated in question number twelve. Ninety-two per cent of the experimental school teachers feel that their situation provides opportunity for integration of subject matter teaching "very well" compared to 31 per cent of the control school teachers. Eight per cent of the experimental and 62 per cent of the control school teachers responded "fairly well" on the same item.

Question fourteen asked teachers from the control and experimental school to state their views on how they felt the NGMATT plan provides for meeting the emotional needs of children at the third-, fourth- and fifth-grade levels. The vast majority of the experimental school teachers feel that the NGMATT plan meets the emotional needs of children regardless of

their grade level. The vast majority of the control school teachers did not know enough about NGMATT to respond to the item. The control school teachers who did, however, respond to the item, responded in a positive manner.

An examination of teacher responses to question number fifteen a and b seem to indicate that each group of teachers, control and experimental, perceives the other teaching situation as having more discipline problems. In other words, the experimental school teachers see more discipline problems in the SCC plan and less in their situation; while control school teachers see more discipline problems in the NGMATT plan and less in their own.

When queried about their preference for teaching in the SCC plan or the NGMATT Plan, the results of question sixteen seem to indicate that both groups of teachers prefer their present teaching situation. A majority of the control school teachers, however, would be willing to try the NGMATT Plan, but the experimental school teachers do not want a self-contained classroom.

Although results obtained in questions number six and thirteen are not supportive of operational Hypothesis 7, neither are they rejective.

To question six, opinions of teachers from the control and experimental school varied greatly. The

responses of the experimental school teachers cover all five categories from "very badly" to "very well" with 45 per cent feeling their assignment provides for reporting to parents and for conferences with parents "poorly" or "very badly" and 38 per cent of the control school teachers responded "poorly" on the same question. In the area of positive response to the same question, 55 per cent of the experimental and 62 per cent of the control school teachers responded either "acceptably," "well" or "very well."

An analysis of the responses to question number thirteen concerning the provision for professional growth activities in their assignment, both experimental and control school teachers responded in all categories from "very well" to "very poorly." More experimental school teachers (38%) than control school teachers (15%) answered "very well," however in the three positive categories of "very well," "well enough" and "moderately," a combined total of 76 per cent of the responses of control school teachers and 75 per cent of the experimental school teachers responses fell in these combined categories.

As was stated previously, questions six and thirteen do not support operational Hypothesis 7, neither are they rejective.

Question number nine is the only question of the sixteen on the Inquiry of Attitudes Toward Teaching Instrument that clearly did not support operational Hypothesis 7. Experimental school teachers when compared to control school teachers strongly feel that the time and energy demands upon them are excessive. Seventy-nine per cent of the experimental school teachers responded either "very excessive" or "somewhat excessive" contrasted to 15 per cent of the control school teachers who responded "somewhat excessive." None of the teachers in the experimental school contrasted with 15 per cent in the control school responded to "less than usual."

In summary, findings obtained by the teacher attitude instrument demonstrate support for operational Hypothesis 7 on the following basis:

A. When asked to indicate over-all reaction to respective teaching assignments as a means of conducting elementary education, 100 per cent of the experimental group reported they were strongly in favor of their assignment as contrasted with 46 per cent of the control group in favor of the self-contained classroom assignment at the time of the present study.

B. Ninety-one per cent of the experimental group teachers contrasted with 50 per cent of the

control group teachers expressed the idea that respective teaching assignments at the time of the present study were much better as compared with the previous year.

C. Over 90 per cent of experimental group teachers reported opinions that pupils' emotional needs were very well or well served in the nongraded, multi-age, team teaching organization.

D. NGMATT Plan teachers felt they were able to provide more adequately for gifted, average and slow students than did their self-contained counterparts.

E. Interest in teaching in a nongraded, multi-age, team teaching situation, if provided the opportunity, was expressed by 60 per cent of the self-contained classroom teachers. One hundred per cent of the NGMATT Plan teachers expressed satisfaction with respect to their teaching assignment.

Teacher Education Scale

Operational Hypothesis 8 states that:

Hypothesis 8:

Teachers in the NGMATT Plan will reflect more progressive and fewer traditional attitudes toward teaching and education generally, as measured by the Education Scale, than teachers who teach in a SCC Plan.

Evident support for the hypothesis may be derived from the response of experimental and control group teachers as illustrated in Table 49.

TABLE 49.--A comparison between experimental and control teachers on the education scale

	N	Mean	S.D.	t
Experimental	24	27.0	10.1	2.63[a]
Control	16	18.3	10.4	

[a] $p < .02$

Sixteen Control School teachers and twenty-four Experimental School teachers responded to the Education Scale in the Spring, 1971. This scale, which was developed by Kerlinger and Kaga, measures attitudes varying from very favorable toward progressive educational practices to very favorable toward traditional educational practices. One of the ten progressive items is: The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society. One of the ten traditional items is: The pupil-teacher relationship is the relationship between a child who needs direction, guidance and control and a teacher who is an expert supplying direction, guidance and control.

The teachers responded to each item according to a six-point scale which ran from agree very strongly to disagree very strongly. A person's total score is obtained by subtracting the score from the ten traditional items from the ten progressive scores. The two subscores can range from 10 - 70 and the total scale score from -60 to +60. A positive total score implies progressive attitudes and a negative total score implies traditional attitudes toward education.

Table 49 presents the results for experimental and control group teachers.

The results presented in Table 49 indicate that both groups of teachers are on the progressive side of the scale. The experimental teachers have, however, significantly more progressive attitudes toward education when compared to the control group teachers.

Parent Opinionnaire

Operational Hypothesis 9 states that:

Hypothesis 9:

> Parents of children in the NGMATT plan will report a more favorable attitude toward their children's school experience, as measured by a locally prepared instrument, than will parents of children taught by a teacher in the SCC plan.

An examination of Table 50 reveals only a partially supportive pattern with respect to operational Hypothesis 9. Supportive evidence can be found only

TABLE 50.--Parent questionnaire--(percentages of response in individual categories: control N = 180; experimental N = 257)

Question	Group	Responses						No Answer	
1. Would you prefer your child to have one rather than two or more classroom teachers during the school day?	Control	One	41	Two or More	47	No Preference		5	7
	Experimental		14		77			5	4

Question	Subject Area		Group	Responses		
				Too Little Emphasis	About Right	Too Much Emphasis
2. How do you feel about the degree of emphasis our teaching this year placed on each of the following subjects?	Reading	Total	Control	20	79	1
		Total	Experimental	29	71	0
		Third	Control	13	87	0
		Third	Experimental	17	83	0
		Fourth	Control	22	78	0
		Fourth	Experimental	43	56	1
		Fifth	Control	26	74	0
		Fifth	Experimental	27	73	0
	Mathematics	Total	Control	14	80	6
		Total	Experimental	21	75	4
		Third	Control	12	79	9
		Third	Experimental	21	76	3

TABLE 50.--Continued.

Question	Subject Area	Group		Responses		
				Too Little Emphasis	About Right	Too Much Emphasis
	Mathe-matics	Fourth	Control	25	73	2
		Fourth	Experimental	21	74	5
		Fifth	Control	11	82	7
		Fifth	Experimental	21	75	4
	Social Studies	Total	Control	8	86	6
		Total	Experimental	11	85	4
		Third	Control	12	88	0
		Third	Experimental	1	90	9
		Fourth	Control	10	78	12
		Fourth	Experimental	14	80	6
		Fifth	Control	5	86	9
		Fifth	Experimental	12	85	3
	Science	Total	Control	20	79	1
		Total	Experimental	13	86	2
		Third	Control	20	80	0
		Third	Experimental	14	86	0
		Fourth	Control	30	68	2
		Fourth	Experimental	16	82	3

TABLE 50.--Continued.

Question	Subject Area	Group		Responses		
				Too Little Emphasis	About Right	Too Much Emphasis
	Science	Fifth	Control	19	81	0
		Fifth	Experimental	8	89	3
	Spelling	Total	Control	25	73	2
		Total	Experimental	38	60	2
		Third	Control	23	75	2
		Third	Experimental	38	60	2
		Fourth	Control	18	80	2
		Fourth	Experimental	41	56	4
		Fifth	Control	45	52	3
		Fifth	Experimental	33	65	2
	Language	Total	Control	23	76	1
		Total	Experimental	27	71	2
		Third	Control	18	82	0
		Third	Experimental	20	78	2
		Fourth	Control	30	70	0
		Fourth	Experimental	32	68	0
		Fifth	Control	28	72	0
		Fifth	Experimental	31	65	4

TABLE 50.--Continued.

Question	Group		Responses			
			No Change in Interests	Greater Interest in Specific Subject	Generally, Interests Have Broadened	Fewer Interests
3. To what extent, if any, has your child's interest changed in school this past year?	Total	Control	12	11	73	4
	Total	Experimental	16	19	59	6
	Third	Control	12	8	70	10
	Third	Experimental	16	23	57	4
	Fourth	Control	19	10	71	0
	Fourth	Experimental	18	21	48	13
	Fifth	Control	9	14	77	0
	Fifth	Experimental	14	12	73	1

Question	Group		Responses				
			Very Desirable	Desir-able	No Change	Unde-sirable	Very Unde-sirable
4. Have you noticed any attitude or behavior changes in your child which you would attribute to the teaching in school?	Total	Control	15	35	44	5	1
	Total	Experimental	15	41	31	11	2
	Third	Control	5	38	48	9	0
	Third	Experimental	23	38	27	10	2
	Fourth	Control	13	31	50	4	2
	Fourth	Experimental	5	41	34	19	1

TABLE 50.--Continued.

Question	Group	Responses				
		Very Desirable	Desirable	No Change	Undesirable	Very Undesirable
Fifth	Control	20	33	44	3	0
Fifth	Experimental	15	43	34	6	2

Question	Group	Responses				
		None	One	Two	Three	Four or More
5. How many parent-teacher conferences have you had this year about your child?	Total Control	38	38	19	3	2
	Total Experimental	9	31	35	16	9
	Third Control	41	33	20	3	3
	Third Experimental	9	25	34	22	10
	Fourth Control	34	44	14	6	2
	Fourth Experimental	10	38	27	12	13
	Fifth Control	44	38	16	0	2
	Fifth Experimental	10	30	36	22	2

TABLE 50.--Continued.

Question	Group		Responses				
			Very Well	Well	Average	Poorly	Very Poorly
6. How well do you feel the school has provided for your child's learning this year?	Total	Control	40	40	17	3	0
	Total	Experimental	34	31	29	5	2
	Third	Control	29	44	24	3	0
	Third	Experimental	45	26	22	6	1
	Fourth	Control	27	51	18	4	0
	Fourth	Experimental	27	32	33	7	1
	Fifth	Control	61	25	12	2	0
	Fifth	Experimental	30	35	31	2	2

in question one. Results obtained by question number two through six appear to detract from the significance of evidence associated with response to question one.

There appears to be little evidence, in data obtained in questions two through six, that parents whose children participated in the nongraded, multi-age, team teaching (NGMATT) plan reflected a more favorable attitude toward their children's school experience during the tenure of the present experiment, as contrasted with the attitudes of parents whose children participated in the self-contained classroom (SCC) arrangement. Generally speaking, the attitudes of both the experimental and control group parents appeared to be equally favorable toward pupils' school experiences at the time of the present study.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS FOR FUTURE RESEARCH

Summary

The purpose of the present study was to compare the effects of a nongraded, multi-age, team teaching organization with the self-contained classroom organization. The study was concerned with the academic achievement of students in grades three, four and five in the subject areas of reading, mathematics, social studies and science. A related purpose of the study was to evaluate the attitudes of students toward their in-school experience and the attitudes of their teachers and their parents as a result of participating in the experimental project. In addition, the level of creative abilities and the self-concept and motivation of students at the third, fourth and fifth grades were measured.

In the evaluation process certain standardized achievement tests were used with pupils as well as locally prepared attitude scales with teachers and parents. Standardized instruments used with pupils were:

(1) Sequential Test of Educational Progress (Step) Level 4 (Grades 3, 4, 5), Forms A and B;

(2) Torrance Tests of Creative Thinking; and

(3) Self-Concept and Motivation Inventory.

Attitude scales were designed to collect certain information from teachers and parents involved in the study. A pilot run was accomplished with each scale prior to its use in the study in order to eliminate ambiguity of interpretation by those responding. The scales employed in the study to collect attitudinal data were: (a) Teacher Education Scale, (b) Teacher Attitude Scale and (c) Parent Opinionnaire.

The pupil sample employed in the study was drawn from a population of third-, fourth- and fifth-grade students of two public elementary schools in Grand Blanc, Michigan. The school selected as the control school for purposes of comparison in the study was on the basis of the contention that the population and the socio-economic environment was comparable to the conditions at the experimental school. Both principals, control and experimental, expressed an interest and willingness to participate in the study.

The study sample of students was selected from a pool of 535 available third-, fourth- and fifth-grade students in the two schools. The analysis of covariance

served as the basis for the study design. This design provided for the testing of significant differences between adjusted group means on "pre and post" creative thinking, self-concept and motivation and achievement test scores. The following variables were set as criteria for matching: (1) grade (grades three, four and five); (2) school (experimental, Cook; and control, Indian Hill) and (3) subject area (science, mathematics, reading and social studies).

Three teams of four teachers--each serving grades three, four and five for a total of twelve teachers--were involved in the experimental school. The control group teachers consisted of seven in number.

Pre- and post-achievement, self-concept and creativity testing of students was accomplished in December, 1969, and May, 1970, respectively.

Teacher and parent attitude scales were administered in the 1970-71 school year.

Achievement, self-concept and creativity data were submitted to the computer laboratory at Oakland Intermediate Schools for analysis on a program designed in conjunction with the analysis of covariance. F-ratios were then obtained from print-out data by computing adjusted mean squares. Next, a comparison of means was made where statistically significant F-ratios were obtained. These comparisons were made on the basis of a visual inspection of adjusted means.

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Responses of teachers and parents to attitude scales were analyzed by computing the basis of percentage responding to each alternative for each item on each questionnaire respectively.

Conclusions

Conclusions arrived at on the basis of the present study will be presented separately as pupil academic achievement, pupil creative thinking, pupil self-concept and motivation, teacher attitude and parent attitude.

It is apparent that conclusions of the present study can be generalized only to the particular form of nongraded, multi-age, team teaching investigated and under the study conditions specified.

Pupil Academic Achievement

A. At the third-grade level, the findings of the present study indicate that the growth of pupils in the four areas of science, mathematics, reading and social studies from the SCC and NGMATT organizational plans was the same.

B. The growth was the same for the fourth-grade students in the SCC and NGMATT organizational plans with the exception of mathematics. In the mathematics area the control group (SCC) gained more than the experimental group (NGMATT).

Responses of teachers and parents to attitude questionnaire respectively.

Corresponding to each alternative for each item on each questionnaire were analyzed by computing the basis of percentage

Conclusions

Conclusions arrived at on the basis of the present study will be presented separately as pupil academic achievement, pupil creative thinking, pupil self-concept and motivation, teacher attitude and parent attitude.

It is apparent that conclusions of the present study can be generalized only to the particular form of graded, multi-age, team teaching investigated and under the study conditions specified.

Pupil Academic Achievement

A. At the third-grade level, the findings of the present study indicate that the growth of pupils in the four areas of science, mathematics, reading and social studies from the SCC and MCMATT organizational plans was the same.

B. The growth was the same for the fourth-grade students in the SCC and MCMATT organizational plans with the exception of mathematics. In the mathematics area the control group (SCC) gained more than the experimental group (MCMATT).

C. The growth between the two groups (SCC and NGMATT) was the same for the fifth-grade students with the exception of social studies. In the social studies area the control (SCC) students, again, exceeded the experimental students (NGMATT).

D. The findings of the present study do not appear to represent a significant trend favoring either school's academic achievement. At best, it can be stated that students attending either the Cook School (experimental) or the Indian Hill School (control) can be expected to achieve academically in reading, mathematics, social studies and science as well in one as in the other.

E. The statistical results regarding the curricular areas of reading science, social studies and mathematics do not suggest support for Hypotheses 1, 2, 3 and 4 which state:

Hypothesis 1:

Pupil achievement in social studies in the nongraded multi-age, team teaching plan (NGMATT), as measured on the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the self-contained classroom (SCC).

Hypothesis 2:

Pupil achievement in science in the NGMATT plan, as measured by STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

C. The growth between the two groups (SCC and MCMATT) was the same for the fifth-grade students with the exception of social studies. In the social studies area the control (SCC) students, again, exceeded the experimental students (MCMATT).

D. The findings of the present study do not appear to represent a significant trend favoring either school's academic achievement. At best, it can be stated that students attending either the Cook School (experimental) or the Indian Hill School (control) can be expected to achieve academically in reading, mathematics, social studies and science as well in one as in the other.

E. The statistical results regarding the curricular areas of reading science, social studies and mathematics do not suggest support for Hypothesis 1, 2, 3 and 4 which state:

Hypothesis 1:

Pupil achievement in social studies in the nongraded multi-age, team teaching plan (TTAMCM), as measured on the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the self-contained classroom (SCC).

Hypothesis 2:

Pupil achievement in science in the MCMATT plan, as measured by STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 3:

Pupil achievement in reading in the NGMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 4:

Pupil achievement in mathematics in the NGMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Pupil Creative Thinking

The findings for the third, fourth and fifth grades on the creative thinking tests tended to favor the experimental school (Cook). This statement is supported by the fact that in six of the twenty-one areas reported, experimental school students produced scores that were statistically significant; in addition, a pattern of superior performance was noted in the areas of verbal flexibility and verbal originality from grade three through grade five.

The findings of the Torrance Tests of Creative Thinking suggests support for Hypothesis 5 which states:

Hypothesis 5:

Pupils in the NGMATT plan will demonstrate higher levels of creative thinking ability as measured by the Torrance Tests of Creative Thinking, than will pupils who have been taught by a single teacher in the SCC plan.

Hypothesis 3:

Pupil achievement in reading in the MDMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Hypothesis 4:

Pupil achievement in mathematics in the MDMATT plan, as measured by the STEP test level four, will be greater than the achievement of pupils taught by a single teacher in the SCC.

Pupil Creative Thinking

The findings for the third, fourth and fifth grades on the creative thinking tests tended to favor the experimental school (Cook). This statement is supported by the fact that in six of the twenty-one areas reported, experimental school students produced scores that were statistically significant; in addition, a pattern of superior performance was noted in the areas of verbal flexibility and verbal originality from grade three through grade five.

The findings of the Torrance Tests of Creative Thinking suggests support for Hypothesis 5 which states:

Hypothesis 5:

Pupils in the MDMATT plan will demonstrate higher levels of creative thinking ability as measured by the Torrance Tests of Creative Thinking, than will pupils who have been taught by a single teacher in the SCC plan.

Pupil Self-Concept and Motivation (SCAMIN)

A. The experimental school students (Cook) exhibited a consistently significant advantage over control school students (Indian Hill) in motivation at grades three and four.

B. Although the self-concept scores of third- and fourth-grade control school (Indian Hill) students are both statistically significant when contrasted to scores of experimental school (Cook) students, the consistency of the scores for experimental school students across the three grades represents a more positive value.

Granting that the statistical results obtained from the SCAMIN do not lend support for Hypothesis 6, neither do the results lend support for rejecting this hypothesis which states:

Hypothesis 6:

Pupils in the NGMATT plan will exhibit more positive feelings about self and demonstrate higher levels of motivation for learning, as measured by the Self-Concept and Motivation Inventory, than will pupils who have been taught by a single teacher in the SCC plan.

Rather, the interpretation of the inter-related association of the data obtained by the SCAMIN test suggests the tendency to lend support to the experimental school (Cook) program in the category of self-concept.

Pupil Self-Concept and Motivation (SCAMIN)

V. The experimental school students (Cook) exhibited a consistently significant advantage over control school students (Indian Hill) in motivation at grades three and four.

B. Although the self-concept scores of third- and fourth-grade control school (Indian Hill) students are both statistically significant when contrasted to scores of experimental school (Cook) students, the consistency of the scores for experimental school students across the three grades represents a more positive value.

Granted that the statistical results obtained from the SCAMIN do not lend support for Hypothesis 6, neither do the results lend support for rejecting this hypothesis which states:

Hypothesis 6:

Pupils in the MDMATT plan will exhibit more positive feelings about self and demonstrate higher levels of motivation for learning, as measured by the Self-Concept and Motivation Inventory, than will pupils who have been taught by a single teacher in the SCC plan.

Rather, the interpretation of the inter-related association of the data obtained by the SCAMIN test suggests the tendency to lend support to the experimental school (Cook) program in the category of self-concept.

Teacher Attitude

A. Teacher attitudes, as measured by the Teacher Attitude Instrument, appeared to favor the NGMATT plan over the SCC plan in Grand Blanc at the time of the present study. Support is therefore indicated for Hypothesis 7 which states:

Hypothesis 7:

Teachers in the NGMATT plan will report a more favorable attitude toward their job, as measured by a locally prepared instrument, than teachers who teach in a SCC plan.

B. The findings on the Teacher Education Scale indicate that both groups of teachers are on the progressive side of the scale. The experimental school teachers (Cook) have, however, significantly more progressive attitudes toward education when compared to the control school (Indian Hill) teachers.

The findings tend to support Hypothesis 8 which states that:

Hypothesis 8:

Teachers in the NGMATT plan will reflect more progressive and fewer traditional attitudes toward teaching and education generally, as measured by the Education Scale, than teachers who teach in a SCC plan.

Teacher Attitude

A. Teacher attitudes, as measured by the Teacher Attitude Instrument, appeared to favor the NCMATT plan over the SCC plan in Grand Blanc at the time of the present study. Support is therefore indicated for Hypothesis 1 which states:

Hypothesis 1:

Teachers in the NCMATT plan will report a more favorable attitude toward their job, as measured by a locally prepared instrument, than teachers who teach in a SCC plan.

B. The findings on the Teacher Education Scale indicate that both groups of teachers are on the progressive side of the scale. The experimental school teachers (Cook) have, however, significantly more progressive attitudes toward education when compared to the control school (Indian Hill) teachers.

The findings tend to support Hypothesis 2 which states that:

Hypothesis 2:

Teachers in the NCMATT plan will reflect more progressive and fewer traditional attitudes toward teaching and education generally, as measured by the Education Scale, than teachers who teach in a SCC plan.

Parent Attitude

No clear-cut evidence could be found to support the contention that parents of children who participated in the NGMATT plan developed a more favorable attitude toward their children's education as compared to the attitudes of parents with children assigned to the SCC plan.

Operational Hypothesis 9 cannot be supported; it states:

> Hypothesis 9:
>
> Parents of children in the NGMATT plan will report a more favorable attitude toward their children's school experience, as measured by a locally prepared instrument, than will parents of children taught by a teacher in the SCC plan.

Implications for Future Research

Generally in the field of educational research the results obtained give rise to a series of questions left unanswered. The present study is no exception. In reality, it is probable that the most important contribution of a research effort such as the study presented is the generation of such issues. From these issues, additional hypotheses may be advanced and additional investigations may be stimulated.

It is the contention of the writer that more educational decisions should be based upon available empirical knowledge rather than the apparent prevailing tendency to rely on "intuitive" judgment.

Parent Attitude

No clear-cut evidence could be found to support the contention that parents of children who participated in the MCMATT plan developed a more favorable attitude toward their children's education as compared to the attitudes of parents with children assigned to the SCC plan.

Operational Hypothesis 9 cannot be supported; it states:

Hypothesis 9:

Parents of children in the MCMATT plan will record a more favorable attitude toward their children's school experience, as measured by a locally prepared instrument, than will parents of children taught by a teacher in the SCC plan.

Implications for Future Research

Generally in the field of educational research the results obtained give rise to a series of questions left unanswered. The present study is no exception. In reality, it is probable that the most important contribution of a research effort such as the study presented is the generation of such issues. From these issues, additional hypotheses may be advanced and additional investigations may be stimulated.

It is the contention of the writer that more empirical knowledge rather than the apparent prevailing tendency to rely on "intuitive" judgment.

Therefore the following suggestions are offered as guides to other researchers interested in the area of nongraded, multi-age, team teaching forms of elementary school organization:

1. There is a need to investigate the inter-action of variables associated with the present study, e.g., do fifth-grade pupils achieve better than third-grade pupils in NGMATT patterns, and/or do boys and girls achieve alike, and/or is the NGMATT pattern more conducive to pupils with higher I.Q.'s than with children of lower I.Q.'s?

2. More effective techniques for evaluating pupils' readiness and achievement in academic areas of the curriculum in NGMATT programs need to be studied. In addition to standardized achievement batteries, there is a need for NGMATT teachers to develop more effective diagnostic habits in the form of informal inventories of pupil academic growth.

3. The influence of a planned and structured approach to the in-service training of NGMATT teachers should be investigated in relationship to teaching productivity.

4. The importance of personal-social relationships between NGMATT teachers should be evaluated with

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2. More effective techniques for evaluating pupils' readiness and achievement in academic areas of the curriculum in NCMATT programs need to be studied. In addition to standardized achievement batteries, there is a need for NCMATT teachers to develop more effective diagnostic habits in the form of informal inventories of pupil academic growth.

3. The influence of a planned and structured approach to the in-service training of NCMATT teachers should be investigated in relationship to teacher-pupil productivity.

4. The importance of personal-social relationships between NCMATT teachers should be evaluated with

respect to the ability of team members to plan cooperatively and to conduct an educational program for pupils.

5. There is a need for follow-up and longitudinal type research into junior high and senior high school setting with respect to students having experienced a NGMATT approach at the elementary school level.

6. The apparent need for more specifically directed programs of parent involvement and communication with respect to a NGMATT organizational arrangement is derived from the results obtained in the parent questionnaire.

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BIBLIOGRAPHY

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Books

Brown, B. Frank. The Nongraded High School. New York: Prentice-Hall, 1963.

Goodlad, John I., and Anderson, Robert H. The Nongraded Elementary School. rev. ed. New York: Harcourt, Brace and World, Ind., 1963.

Heathers, Glen. Organizing Schools Through the Dual Progress Plan. Danville, Ill.: The Interstate Printers and Publishers, Inc., 1967.

Lambert, Philip, et al. Classroom Interaction, Pupil Achievement and Adjustment in Team Teaching as Compared with the Self-Contained Classroom. Madison, Wisc.: University of Wisconsin Press, 1964.

Otto, Henry J. Current Practices in the Organization of Elementary Schools. Evanston: Northwestern University Press, 1932.

_____. Elementary School Organization. 3rd ed. New York: Appleton-Century-Crofts, Inc., 1954.

Snyder, Edith R., ed. The Self-Contained Classroom. Washington, D.C.: Association for Supervision and Curriculum Development, 1960.

Stoddard, George D. The Dual Progress Plan. Evanston, Ill.: Harper and Row, Publishers, 1961.

Tate, Merle W. Statistics in Education. New York: The Macmillan Company, 1955.

Vogel, Francis X., and Bowers, Norman D. Pupil Attitudes, Achievement and Behavior in a Multi-Age Non-graded School. Final Report. Evanston, Ill.: Northwestern University Press, 1968.

BIBLIOGRAPHY

Books

Brown, B. Frank. The Nongraded High School. New York: Prentice-Hall, 1963.

Goodlad, John I., and Anderson, Robert H. The Nongraded Elementary School. rev. ed. New York: Harcourt, Brace and World, Inc., 1963.

Heathers, Glen. Organizing Schools Through the Dual Progress Plan. Danville, Ill.: The Interstate Printers and Publishers, Inc., 1967.

Lambert, Philip, et al. Classroom Interaction, Pupil Achievement and Adjustment in Team Teaching as Compared with the Self-Contained Classroom. Madison, Wisc.: University of Wisconsin Press, 1964.

Otto, Henry J. Current Practices in the Organization of Elementary Schools. Evanston: Northwestern University Press, 1932.

_____. Elementary School Organization. 3rd ed. New York: Appleton-Century-Crofts, Inc., 1954.

Snyder, Edith R., ed. The Self-Contained Classroom. Washington, D.C.: Association for Supervision and Curriculum Development, 1960.

Stoddard, George D. The Dual Progress Plan. Evanston, Ill.: Harper and Row, Publishers, 1961.

Tate, Merle W. Statistics in Education. New York: The Macmillan Company, 1955.

Vogel, Francis X., and Bowers, Norman D. Pupil Attitudes, Achievement and Behavior in a Multi-Age Non-graded School. Final Report. Evanston, Ill.: Northwestern University Press, 1968.

Articles and Publications

Anderson, Robert H. "Team Teaching." NEA Journal (March, 1961).

Brownell, John A., and Taylor, Hannis A. "Theoretical Perspectives for Teaching Teams." Phi Delta Kappan, XLIII (January, 1962), 150-57.

Dean, Stuart E. Elementary School Administration and Organization: A National Survey of Practices and Policies, Bulletin No. 11. Washington, D.C.: Government Department of Health, Education, and Welfare, OE-23006, 1960.

Dunn, Mary. "Should There Be Any Set Type of Elementary School Organization?" Elementary School Journal, LIII (February, 1949).

Gibb, E. Glenadine, and Matala, Dorothy L. "Study on the Use of Special Teachers of Science and Mathematics in Grades 5 and 6." School Science Math, LXII (1962).

Ginther, John R., and Shrover, William A. "Team Teaching in English and History at the Eleventh-Grade Level." School Review, LXX (Autumn, 1962), 303-13.

Goodlad, John I. "News and Comment." The Elementary School Journal (October, 1958).

Halliwell, Joseph W. "A Comparison of Pupil Achievement in Graded and Nongraded Primary Rooms." The Journal of Experimental Education (February, 1963).

Johnson, R. H., and Lobb, M. D. "Jefferson County, Colorado, Completes Three Year Study of Staffing, Changing Class Size, Programming, and Scheduling." National Association of Secondary School Principals Bulletin, XLV (January, 1961), 57-78.

Lambert, Philip. "Team Teaching for Today's World." Teachers College Record, LXIV (March, 1963), 480-86.

_____; Goodwin, William L.; and Wiersma, William. "A Comparison of Pupil Adjustment in Team and Self-Contained Organizations." The Journal of Educational Research (March, 1965).

Articles and Publications

Anderson, Robert H. "Team Teaching." NEA Journal (March, 1961).

Brownell, John A., and Taylor, Harris A. "Theoretical Perspectives for Teaching Teams." Phi Delta Kappan, XLIII (January, 1962), 150-52.

Dean, Stuart E. Elementary School Administration and Organization. A National Survey of Practices and Policies, Bulletin No. 17. Washington, D.C.: Government Department of Health, Education, and Welfare, OE-23006, 1960.

Dunn, Mary. "Should There Be Any Set Type of Elementary School Organization?" Elementary School Journal, LXII (February, 1962).

Gibb, E. Glenadine, and Dunkle, Dorothy L. "Study on the Use of Special Teachers of Science and Mathematics in Grades 5 and 6." School Science and Math, LXII (1962).

Ginther, John R., and Glover, William A. "Team Teaching in English and History at the Eleventh-Grade Level." School Review, LXX (Autumn, 1962), 303-13.

Goodlad, John I. "News and Comment." The Elementary School Journal (October, 1958).

Halliwell, Joseph W. "A Comparison of Pupil Achievement in Graded and Ungraded Primary Rooms." The Journal of Experimental Education (February, 1962).

Johnson, R. H., and Lobb, H. D. "Jefferson County, Colorado, Completes Three Year Study of Staffing, Changing Class Size, Programming, and Scheduling." National Association of Secondary School Principals Bulletin, XLV (January, 1961), 57-78.

Lambert, Philip. "Team Teaching for Today's World." Teachers College Record, LXIV (March, 1963), 486-88.

Goodwin, William R.; and Wiersma, William. "A Comparison of Pupil Adjustment in Team and Self-Contained Organizations." The Journal of Educational Research (March, 1962).

McLoughlin, William P. "The Phantom Nongraded School." The Education Digest (March, 1968).

Olds, Henry F. "A Taxonomy for Team Teaching." Team Teaching. Chapter 4. New York: Harper and Row, Publishers, 1964.

Otto, Henry J., et al. "Nongradedness: An Elementary School Evaluation." Bureau of Laboratory Schools Monograph No. 21. Austin, Texas: The University of Texas Press, 1969.

The Principals Look at the Schools. Washington, D.C.: Research Division of the National Education Association, 1962.

Shaplin, Judson T. "Toward a Theoretical Rationale for Team Teaching." Team Teaching. Chapter 3. Evanston, Ill.: Harper and Row, Publishers, 1964.

Suttle, John E. "The Nongraded Elementary School." Curriculum Bulletin, XVIII, Nos. 12, 19 (1962).

Vogel, Francis X., and Bowers, Norman D. "The Relationship of Form of School Organization to Pupil Behavior." Paper presented at the Annual Meeting of the American Research Association, Los Angeles, California (February, 1969).

Unpublished Dissertations

Buffie, Edward George. "A Comparison of Mental Health and Academic Achievement: The Ungraded Versus the Graded School." Unpublished Ph.D. dissertation, Indiana University, 1963.

Davis, Harold S. "The Effect of Team Teaching on Teachers." Unpublished Ph.D. dissertation, Wayne State University, 1963.

Hickey, Sister Mary Paul. "An Analysis and Evaluation of the Ungraded Primary Program in the Diocese of Pittsburg." Unpublished Ph.D. dissertation, Fordham University, 1963.

McDonald, William P. "The Phantom Nonpraded School." The Education Digest (March, 1958).

Olds, Henry F. "A Taxonomy for Team Teaching." Team Teaching. Chapter 4. New York: Harper and Row, Publishers, 1964.

Otto, Henry J., et al. "Nonpraded Misses: An Elementary School Evaluation." Bureau of Laboratory Schools Monograph No. 21. Austin, Texas: The University of Texas Press, 1969.

The Principals Look at the Schools. Washington, D.C.: Research Division of the National Education Association, 1962.

Shaplin, Judson T. "Toward a Theoretical Rationale for Team Teaching." Team Teaching. Chapter 3. Evanston, Ill.: Harper and Row, Publishers, 1964.

Suttle, John E. "The Nonpraded Elementary School." Curriculum Bulletin, XVIII, Nos. 12, 13 (1962).

Vogel, Francis X., and Bowers, Norman D. "The Relationship of Form of School Organization to Pupil Behavior." Paper presented at the Annual Meeting of the American Research Association, Los Angeles, California (February, 1969).

Unpublished Dissertations

Bartle, Edward George. "A Comparison of Mental Health and Academic Achievement: The Unpraded Versus the Praded School." Unpublished Ph.D. dissertation, Indiana University, 1963.

Davis, Harold S. "The Effect of Team Teaching on Teachers." Unpublished Ph.D. dissertation, Wayne State University, 1963.

Hickey, Sister Mary Paul. "An Analysis and Evaluation of the Unpraded Primary Program in the Diocese of Pittsburg." Unpublished Ph.D. dissertation, Fordham University, 1963.

Shoresman, Peter B. "A Comparative Study of the Effectiveness of Science Instruction in the Fifth and Sixth Grades Under Two Different Patterns of Teacher Utilization and Pupil Deployment." Unpublished Ph.D. dissertation, Harvard University, 1963.

Tests

Self-Concept and Motivation Inventory (SCAMIN). Dearborn Heights, Michigan: Person-O-Metrics, 1969.

Sequential Tests of Educational Progress. Princeton, N.J.: Educational Testing Service, 1957.

Torrance Tests of Creative Thinking. Princeton, N.J.: Personnel Press, Inc., A Division of Ginn and Company, 1966.

Silverman, Peter B. "A Comparative Study of the Effectiveness of Science Instruction in the Fifth and Sixth Grades Under Two Different Patterns of Teacher Utilization and Pupil Deployment." Unpublished Ph.D. dissertation, Harvard University, 1963.

APPENDICES

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APPENDIX A

EXHIBITS, COVARIANCE GRIDS

APPENDIX A

EXHIBITS, COVARIANCE GRIDS

EXHIBIT A

COVARIANCE GRID, Social Studies STEP Test

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	26.09	26.61	36.77	38.05	43.07	45.82	29.14	30.46	33.49	35.66	38.01	37.02

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

	30'00	30'15	30'30	30'45	31'00	31'15	31'30	31'45	32'00	32'15
Occular	X	↓	X	↓	X	↓	X	↓	X	↓
Exams	3		"		"		"		"	
Spools	Jill waits						CDCV			

COARSAMCP GRID, 2nd set 12:30pm test site

KEY:

X = anterior, ocular - Jay tested

↓ = anterior, ocular - Sue tested

EXHIBIT A

EXHIBIT B

COVARIANCE GRID, Science STEP Test

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	21.09	24.75	30.57	33.43	37.42	38.89	23.62	28.11	30.02	33.13	34.29	34.45

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT B

COMPARISON CHART: Stevens Corp. Test

	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual	Individual
Subject	Test in Mill					Coop						
Score	2	#	2			2						
Response	X Y	X Y	X Y	12.01 12.02	12.03 12.04	12.05 12.06	12.07 12.08	12.09 12.10	12.11 12.12	12.13 12.14	12.15 12.16	12.17 12.18

X = "Yes", Stevens - Not Present

Y = "No", Stevens - Present

Key:

Subject Not - Present

Subject Yet - Present

EXHIBIT C

COVARIANCE GRID, Reading STEP Test

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	29.30	32.95	39.52	41.95	46.14	47.70	32.28	33.66	37.99	40.21	42.87	44.26

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

	30°30	33°02	34°25	37°02	40°10	41°30	33°30	30°06	32°21	42°51	44°30
ESCOLAR	X	X	X	X	X	X	X	X	X	X	X
ICAMOR	3	"	"	2	3	"	2				
ESQUISTE	TAPIRA HILL						COOK				

COARSTVACE GRID, Wrapped SIZE TEST

EXHIBIT C

KEY:

X = "Mesh", ESCOLAR - SAG Location

X = "Mesh", ESCOLAR - TAT Location

EXHIBIT D

COVARIANCE GRID, Mathematics STEP Test

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	16.27	16.66	21.92	23.85	27.46	29.74	18.27	18.73	21.86	21.30	24.93	26.15

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT D

COVARIANCE DETC Mathematics STCC Test

Schools	Indian Hill					Cook					
Grade	3		4		5	3		4		5	
Areas	X	Y	X	Y	X	X	Y	X	Y	X	Y
	12.01	24.84	12.02	25.85	14.12	12.01	24.84	12.02	25.85	14.12	24.84

```
Select Cases - Use Cases where "Schools" = 1.

Regression - Linear - Dependent = X
                    - Independent = Y
```

EXHIBIT E

COVARIANCE GRID, Verbal Fluency Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	37.73	34.91	35.67	37.33	36.25	37.50	38.00	37.50	32.50	37.50	42.00	44.50

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT E

COMPARISON OF 10-day Lynch Journal Sample to 91st Street Journal

Neighborhood	Individual																
Name																	
Street																	

Key:

X = "Yes", "Maybe", Spouse "Yes" - Spouse "Maybe"

Y = "No", "Definitely Not" - Spouse "No", "Definitely Not"

EXHIBIT F

COVARIANCE GRID, Verbal Flexibility Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	37.73	40.45	43.00	44.33	46.25	42.08	38.00	45.00	38.13	44.38	51.00	54.50

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

	21-43	40-49	50-00	00-32	40-32	40-00	38-00	54-00	21-00	21-00	24-20
Groups	X	4	X	A	X	A	X	A	X	X	4
Grade		3		"		2		2		"	2
Regents					1951 HIT				Comm		

GUARANTEE CRIB, and all transfers to insure keep to Carolyn Johnson

EXHIBIT 1

Key:

A = Wrong, Groups - Jay Hooper

X = Wrong, Group - Pat Martin

EXHIBIT G

COVARIANCE GRID, Verbal Originality Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	37.27	41.36	40.00	43.00	45.00	42.08	39.00	45.00	39.38	43.75	41.50	50.50

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT 2

COVERAGE CHILD, AGE AND RELATIONSHIP TO HEAD OF CENTRE INDIAN

| | | |

EXHIBIT H

COVARIANCE GRID, Figural Fluency Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	39.09	34.55	46.33	38.67	45.42	40.42	41.00	42.00	34.38	41.25	45.00	42.50

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT H

CONTINUOUS CREW, Flight Time Duty Period Overlap Pairs of Overlap Pairings

Schools	Indian Hill						Cook					
Grade	5		6		7		5		6		7	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	23.03	24.85	26.83	28.87	29.45	30.42	27.03	28.03	29.03	30.03	31.03	32.03

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT I

COVARIANCE GRID, Figural Flexibility Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	43.18	40.45	49.67	45.00	50.83	44.58	43.00	46.50	40.00	45.00	50.00	48.00

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT 1

COMPARATIVE CHART, LIBERAL VS CONSERVATIVE POLITICAL PLATFORM

Schools	Indian Hill				Cook					
Issues	Democrat		Republican		Democrat		Republican		Socialist	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Taxes	X	X	X	X	X	X	X	X	X	X
Schools	X	X	X	X	X	X	X	X	X	X
Roads	X	X	X	X	X	X	X	X	X	X
Welfare	X	X	X	X	X	X	X	X	X	X
Crime	X	X	X	X	X	X	X	X	X	X

Brittany Fur Breeds, Records, Pedigrees

XXX

Mariner Bay - Seated Portrait

Y = Yellow, Green - Seated

EXHIBIT J

COVARIANCE GRID, Figural Originality Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	45.00	57.73	53.00	49.33	46.67	56.67	45.50	51.00	35.62	61.88	50.50	66.50

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

COVERAGE GRID, LIKELY OCCUPIED STRUCTURE "HEAT" CHECKLIST WORKSHEET

Squads	Team KIT						Copy					
Stacks	3			2			2			2		
Covers	X	X	X	X	X	X	X	X	X	X	X	X
	00:00	01:13	03:00	05:35	06:04	08:01	09:20	10:00	10:53	11:58	00:20	00:20

X = Primary Cover - 2nd Operator

X = Secondary Cover - 1st Operator

KEY:

EXHIBIT K

COVARIANCE GRID, Figural Elaboration Torrance Tests of Creative Thinking

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	58.64	41.36	52.67	42.00	57.92	47.50	56.00	48.00	60.63	45.00	63.50	47.00

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

COMPLIANCE GRID: Virtual Exposition Performance Tests by Operating Platform

EXHIBIT K

Platform	Mac				PC				Linux			
Browser	3				2				1			
Group	Safari		Firefox		Chrome		Opera		Konqueror		Epiphany	
Version	3.0.4	4.0.3	2.0.0.20	3.5.7	3.0.195	4.0.302	9.64	10.10	3.5.9	4.4.0	2.22.3	2.26.3
Test 1	X	X	X	X	X	X	X	X	X	X	X	X
Test 2	X	X	X	X	X	X	X	X	X	X	X	X
Test 3	X	X	X	X	X	X	X	X	X	X	X	X

KEY:

X = Platform, Browser - Test Failure

Y = Platform, Browser - Test Success

EXHIBIT L

COVARIANCE GRID, Goal/Achievement Needs Self-Concept and Motivation Inventory

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	53.81	52.05	51.25	50.46	49.95	47.55	50.88	50.34	49.33	48.15	48.27	46.59

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT F

COMPARATIVE DATA, Specialty Apparel Retail Companies and Motivation Inventory

Company	Item Market																	

EXHIBIT M

COVARIANCE GRID, Failure Avoidance Self-Concept and Motivation Inventory

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	46.55	45.78	46.18	43.82	45.03	43.62	48.49	48.24	46.05	46.41	47.22	45.99

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT B

COMPARATIVE USED TRUCKLOAD SPOT RATES BY METROPOLITAN AREA

		Dallas Hill				Cook				Houston			
		3		2		3		2		3		2	
Origin	Destination	Rate	Trend	Rate	Trend	Rate	Trend	Rate	Trend	Rate	Trend	Rate	Trend
Dallas	Houston	$2.22	X	$1.78	X	$2.03	X	$1.62	X	$2.78	X	$2.22	X
	Cook	$2.78	X	$2.22	X	$2.53	X	$2.03	X	$3.48	X	$2.78	X
Houston	Dallas	$2.78	X	$2.22	X	$2.53	X	$2.03	X	$3.48	X	$2.78	X
	Cook	$3.48	X	$2.78	X	$3.16	X	$2.53	X	$4.34	X	$3.48	X

KEY:

X = "status" remains same - 1st Period

Subject "status" changes - 2nd Period

Y = "status" remains same - 2nd Period

COVARIANCE GRID, Role Expectations Self-Concept and Motivation Inventory

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	47.56	47.95	46.39	46.31	46.28	43.69	46.44	43.80	44.68	42.96	43.03	42.26

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

Equipment	Range	Accuracy
Cook	2	X
2	4	X
Cook	2	X
2	4	X
Cook	2	X
2	4	X
Cook	2	X
2	4	X

Key:

X = Yield, Ground - Soil Texture

X = Density, Ground - Soil Texture

Table XIII

Observable data, soil characteristics data, Concrete and Agitator Truck

EXHIBIT O

COVARIANCE GRID, Self-Adequacy Self-Concept and Motivation Inventory

Schools	Indian Hill						Cook					
Grade	3		4		5		3		4		5	
Scores	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
	43.77	44.59	43.70	43.34	43.25	42.17	42.02	41.52	40.91	40.27	40.56	40.41

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

EXHIBIT O

COMPARATIVE CHART, Self-Adequacy Self-Concept and Motivation Inventory

School	Grade	Course		Indian Hill			Cook				
				2	4	5	3	4	5		
		83.71	94.59	X	X	X	X	X	X	X	X
			89.70	89.96	X	X	X	X	X	X	X
			89.58	91.17	X	X	X	X	X	X	X
			91.02	91.02	X	X	X	X	X	X	X
			90.21	90.27	X	X	X	X	X	X	X
			90.58	90.91	X	X	X	X	X	X	X

KEY:

X = "Before" Scores - 1st Testing

Y = "After" Scores - 2nd Testing

APPENDIX B

EXHIBITS, ATTITUDE QUESTIONNAIRES

APPENDIX B

EXHIBIT A

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date May 10, 1971

To: Miss Vera Russell and Mr. Ron Angles
From: Edwin W. Crandell
Re: Education Scale

Date to be Administered May 13, 1971 - A.M.

Returned to Deputy Superintendent May 13, 1971 - Noon

Completed by Teachers K-5

EXHIBIT A

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date May 10, 1971

To: Miss Vera Russell and Mr. Ron Angles
From: Edwin W. Grandell
Re: Education Scale

Date to be Administered May 13, 1971 - A.M.

Returned to Deputy Superintendent May 13, 1971 - Noon

Completed by Teachers K-5

EXHIBIT B

Grand Blanc Community Schools
Grand Blanc, Michigan

EDUCATION SCALE

Instructions: Given below are 20 statements on educational ideas and problems about which we all have beliefs, opinions, and attitudes. We all think differently about such matters, and this scale is an attempt to let you express your beliefs and opinions. Respond to each of the items as follows:

Agree Very Strongly	+3	Disagree Very Strongly	-3
Agree Strongly	+2	Disagree Strongly	-2
Agree	+1	Disagree	-1

For example, if you agree very strongly with a statement, you would write +3 on the short line preceding the statement, but if you should happen to disagree with it, you would put -1 in front of it. Respond to each statement; try to respond and then go on.

- -

Date _____ School _____

At what grade level are you teaching this year? _____

Number of years you have taught, here or elsewhere (check)

Less than 2 _____ 2-5 _____ Over 5 _____

_____ 1. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society.

_____ 2. No subject is more important than the personalities of the pupils.

_____ 3. Schools of today are neglecting the three R's.

_____ 4. The pupil-teacher relationship is the relationship between a child who needs direction, guidance, and control and a teacher who is an expert supplying direction, guidance and control.

_____ 5. Teachers, like university professors, should have academic freedom - freedom to teach what they think is right and best.

_____ 6. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.

EXHIBIT B

Grand Blanc Community Schools
Grand Blanc, Michigan

EDUCATION SCALE

Instructions: Given below are 20 statements on educational ideas and problems about which we all have beliefs, opinions, and attitudes. We all think differently about such matters, and this scale is an attempt to let you express your beliefs and opinions. Respond to each of the items as follows:

Agree Very Strongly +3 Disagree Very Strongly -3
Agree Strongly +2 Disagree Strongly -2
Agree +1 Disagree -1

For example, if you agree very strongly with a statement, you would write +3 on the short line preceding the statement, but if you should happen to disagree with it, you would put -3 in front of it. Respond to each statement; try to respond and then go on.

Date _____ School _____

At what grade level are you teaching this year? _____

Number of years you have taught, here or elsewhere (check)

Less than 2 _____ 2-5 _____ Over 5 _____

_____ 1. The goals of education should be dictated by children's interests and needs, as well as by the larger demands of society.

_____ 2. No subject is more important than the personalities of the pupils.

_____ 3. Schools of today are neglecting the three R's.

_____ 4. The pupil-teacher relationship is the relationship between a child who needs direction, guidance, and control and a teacher who is an expert supplying direction, guidance and control.

_____ 5. Teachers, like university professors, should have academic freedom - freedom to teach what they think is right and best.

_____ 6. The backbone of the school curriculum is subject matter; activities are useful mainly to facilitate the learning of subject matter.

_____ 7. Teachers should encourage pupils to study and criticize our own and other economic systems and practices.

_____ 8. The traditional moral standards of our culture should not just be accepted; should be examined and tested in solving the present problems of students.

_____ 9. Learning is experimental; the child should be taught to test alternatives before accepting any of them.

_____10. The curriculum consists of subject matter to be learned and skills to be acquired.

_____11. The true view of education is so arranging learning that the child gradually builds up a storehouse of knowledge that he can use in the future.

_____12. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

_____13. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.

_____14. Discipline should be governed by long-range interests and well-established standards.

_____15. Education and educational institutions must be sources of new social ideas; education must be a social program undergoing continual reconstruction.

_____16. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in.

_____17. Children should be allowed more freedom than they usually get in the execution of learning activities.

_____18. Children need and should have more supervision and discipline than they usually get.

_____19. Learning is essentially a process of increasing one's store of information about the various fields of knowledge.

_____20. In a democracy, teachers should help students understand not only the meaning of democracy but also the meaning of the ideologies of other political systems.

_____ 7. Teachers should encourage pupils to study and criticize our own and other economic systems and practices.

_____ 8. The traditional moral standards of our culture should not just be accepted; should be examined and tested in solving the present problems of students.

_____ 9. Learning is experimental; the child should be taught to test alternatives before accepting any of them.

_____10. The curriculum contains of subject matter to be learned and skills to be acquired.

_____11. The true view of education is to arrange learning that the child gradually builds up a storehouse of knowledge that he can use in the future.

_____12. One of the big difficulties with modern schools is that discipline is often sacrificed to the interests of children.

_____13. The curriculum should contain an orderly arrangement of subjects that represent the best of our cultural heritage.

_____14. Discipline should be governed by long-range interests and well-established standards.

_____15. Education and educational institutions must be sources of new social ideas; education must be a social program undergoing continual reconstruction.

_____16. Right from the very first grade, teachers must teach the child at his own level and not at the level of the grade he is in.

_____17. Children should be allowed more freedom than they usually get in the execution of learning activities.

_____18. Children need and should have more supervision and discipline than they usually get.

_____19. Learning is essentially a process of increasing one's store of information about the various fields of knowledge.

_____20. In a democracy, teachers should help students understand not only the meaning of democracy but also the meaning of the ideologies of other political systems.

EXHIBIT C

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date May 17, 1971

To: Miss Vera Russell and Mr. Ron Angles
From: Edwin W. Crandell
Re: Inquiry on Attitudes Toward Teaching

Distribution - Close of school day - May 20

Returned to Deputy Superintendent - May 21, 12:00 noon

Teachers Participating - K-5

EXHIBIT C

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date May 17, 1971

To: Miss Vera Russell and Mr. Don Angles
From: Edwin W. Crandell
Re: Inquiry on Attitudes Toward Teaching

Distribution - Close of school day - May 20

Returned to Deputy Superintendent - May 21, 12:00 noon

Teachers Participating - K-5

EXHIBIT D

Grand Blanc Community Schools
Grand Blanc, Michigan

INQUIRY ON ATTITUDES TOWARD TEACHING

Explanation

This brief inquiry gives all teachers a way of indicating how they feel about different aspects of teaching. Teachers' attitudes about this work are of great importance in this research project.

This inquiry is anonymous. However, you are asked to supply the general information about yourself indicated below in order to permit comparison of the attitudes of different groups of teachers.

Please answer all of the questions, even though you may be unsure of your answers to some of the items.

- -

Date _____ School _____

At what grade level are you teaching this year?

Number of years you have taught, here or elsewhere (check)

Less than 2 _____ 2-5 _____ Over 5 _____

1. Your attitudes about the nongraded, multi-age, team teaching plan (NGMATT) may be uncertain because you don't know all the details of the plan. Check below how well you feel you know the plan.

Know it quite fully	Know it fairly well	Know it partially	Much I don't know about it	Know very little about it

2. Indicate your overall reaction to your present teaching assignment as a way of conducting Elementary Education.

Strongly opposed	Moderately opposed	Don't care Either way	Moderately in favor	Strongly in favor

EXHIBIT D

Grand Blanc Community Schools
Grand Blanc, Michigan

INQUIRY ON ATTITUDES TOWARD TEACHING

Explanation

This brief inquiry gives all teachers a way of indicating how they feel about different aspects of teaching. Teachers' attitudes about this work are of great importance in this research project.

This inquiry is anonymous. However, you are asked to supply the general information about yourself indicated below in order to permit comparison of the attitudes of different groups of teachers.

Please answer all of the questions, even though you may be unsure of your answers to some of the items.

- - - -

3. Indicate your feelings about the amount of emphasis that current teaching in your school assignment places on each of the following subjects. Check opposite <u>each</u> subject.

	Far too much	Somewhat too much	About right	Somewhat too little	Far too little
Language Arts	_____	_____	_____	_____	_____
	Far too little	**Somewhat too little**	**About right**	**Somewhat too much**	**Far too much**
Mathematics	_____	_____	_____	_____	_____
	About right	**Somewhat too much**	**Far too much**	**Somewhat too little**	**Far too little**
Arts and Crafts	_____	_____	_____	_____	_____
	Far too much	**Somewhat too much**	**About right**	**Somewhat too little**	**Far too little**
Physical Education . . .	_____	_____	_____	_____	_____
	Far too little	**Somewhat too little**	**About right**	**Somewhat too much**	**Far too much**
Science	_____	_____	_____	_____	_____
	About right	**Somewhat too much**	**Far too much**	**Somewhat too little**	**Far too little**
Social Studies	_____	_____	_____	_____	_____
	Far too much	**Somewhat too much**	**About right**	**Somewhat too little**	**Far too little**
Music	_____	_____	_____	_____	_____

4. How well does teaching in your school assignment provide for academic learning by pupils of different levels of ability? Indicate your feelings by checking opposite each group of pupils.

	Provides exceptionally well	Provides adequately	Provides inadequately	Provides quite poorly	Don't know
Gifted pupils ..	_____	_____	_____	_____	_____
Average pupils .	_____	_____	_____	_____	_____
Slow learners ..	_____	_____	_____	_____	_____

5. Indicate your feelings about the amount of emphasis that current teaching in your school assignment places on each of the following subjects. Check opposite each subject.

	Far too much	Somewhat too much	About right	Somewhat too little	Far too little
Language Arts					
Mathematics					
Arts and Crafts					
Physical Education . . .					
Science					
Social Studies					
Music					

6. How well does teaching in your school assignment provide for academic learning by pupils of different levels of ability? Indicate your feelings by checking opposite each group of pupils.

	Provides exceptionally well	Provides adequately	Inadequately	Provides poorly	Don't know
Gifted pupils . . .					
Average pupils . . .					
Slow learners . . .					

5. Indicate how well you feel your present teaching assignment permits you to meet the emotional needs of pupils generally.

Provides very well	Provides well	Pupils will manage	Provides poorly	Provides very badly

6. Indicate how well you feel your school assignment provides for reporting to parents and for conferences with parents.

Provides very badly	Provides poorly	Provides acceptably	Provides well	Provides very well

7. Check how well you feel your school assignment provides for conducting non-classroom activities (assemblies, band, library, field trips, etc.)

Provides very well	Provides well	Provides acceptably	Provides poorly	Provides very badly

8. If you were to teach, or do teach, in the NGMATT Plan, indicate your feeling regarding teachers instructing children in all subject areas.

Strongly opposed	Moderately opposed	Don't care either way	Moderately in favor	Strongly in favor

9. Under present circumstances, demands on teacher time and energy are (check):

Very excessive	Somewhat excessive	About average	Less than usual	Much less than usual

10. Indicate your feelings about taking part in this research project. (or NGMATT Plan)

Strongly in favor	Moderately in favor	Don't care either way	Moderately opposed	Strongly opposed

5. Indicate how well you feel your present teaching assignment permits you to meet the emotional needs of pupils generally.

Provides very well	Provides well	Fair	Provides poorly	Provides very badly

6. Indicate how well you feel your school assignment provides for reporting to parents and for conferences with parents.

Provides very badly	Provides poorly	Provides acceptably	Provides well	Provides very well

7. Check how well you feel your school assignment provides for conducting non-classroom activities (assemblies, band, library, field trips, etc.)

Provides very well	Provides well	Provides acceptably	Provides poorly	Provides very badly

8. If you were to teach, or do teach, in the MOKMAT Plan, indicate your feeling regarding teachers instructing children in all subject areas.

Strongly opposed	Moderately opposed	Don't care either way	Moderately in favor	Strongly in favor

9. Under present circumstances, demands on teacher time and energy are (check):

Very excessive	Somewhat excessive	About average	Less than usual	Much less than usual

10. Indicate your feelings about taking part in this research project. (on MOKMAT Plan)

Strongly in favor	Moderately in favor	Don't care either way	Moderately opposed	Strongly opposed

11. What reactions do you have to your present teaching assignment as compared to previous years?

Much better	Somewhat better	About the same	Not quite as well	Not nearly as well

12. How well does your teaching assignment provide opportunity for integration of subject matter teaching?

Very poorly	Somewhat poorly	Neither poorly nor well	Fairly well	Very well

13. How well does your present teaching assignment provide for professional growth activities?

Very well	Well enough	Moderately	Poor	Very poorly

14. How well do you feel the NGMATT Plan provides for meeting the emotional needs of the following groups of children? Check each group.

	Don't know	Provides quite poorly	Provides inadequately	Provides adequately	Provides exceptionally well
Third Grade	___	___	___	___	___
Fourth Grade	___	___	___	___	___
Fifth Grade	___	___	___	___	___

11. What reactions do you have to your present teaching assignment as compared to previous years?

12. How well does your teaching assignment provide opportunity for interaction of subject matter insights?

Much better	Somewhat better	About the same	Not quite as well	Not nearly as well

13. How well does your present teaching assignment provide for professional growth activities?

Very poorly	Somewhat poorly	Neither poorly nor well	Fairly well	Very well

14. How well do you feel the NCMATT plan provides for meeting the emotional needs of the following groups of children? Check each group.

	Very well enough	Moderately well	Poor	Very poorly

	Don't Know	Provides poorly	Provides duly	Provides inadequately	Provides adequately	Provides exceptionally well
Third Grade	___	___	___	___	___	___
Fourth Grade	___	___	___	___	___	___
Fifth Grade	___	___	___	___	___	___

15. (a) What effect do you feel teaching in the modified self-contained classroom has on the frequency of discipline problems? Please respond to both 15a and 15b. Under this plan, such problems are:

Much less frequent	Somewhat frequent	About as frequent	Somewhat more frequent	Much more frequent

(b) What effect do you feel teaching in the NGMATT Plan has on the frequency of discipline problems? Under this plan, such problems are:

Much less frequent	Somewhat less frequent	About as frequent	Somewhat more frequent	Much more frequent

16. (a) If you were given the opportunity, would you prefer to teach in the modified self-contained classroom plan?

Yes _____ No _____

Why, or why not: _____

_____

_____

(b) If you were given the opportunity, would you prefer to teach in the NGMATT Plan?

Yes _____ No _____

Why, or why not: _____

_____

_____

PLEASE USE OTHER SIDE IF ADDITIONAL SPACE IS NECESSARY.

15. (a) What effect do you feel teaching in the modified self-contained classroom has on the frequency of discipline problems? Please respond to both 15a and 15b. Under this plan, such problems are:

Much less frequent	Somewhat less frequent	About as frequent	Somewhat more frequent	Much more frequent

(b) What effect do you feel teaching in the MCMATT Plan has on the frequency of discipline problems? Under this plan, such problems are:

Much less frequent	Somewhat less frequent	About as frequent	Somewhat more frequent	Much more frequent

16. (a) If you were given the opportunity, would you prefer to teach in the modified self-contained classroom plan?

Yes _____ No _____

Why, or why not: _____

_____

_____

(b) If you were given the opportunity, would you prefer to teach in the MCMATT Plan?

Yes _____ No _____

Why, or why not: _____

_____

_____

PLEASE USE OTHER SIDE IF ADDITIONAL SPACE IS NECESSARY.

EXHIBIT E

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date June 1, 1971

To: Miss Vera Russell and Mr. Ron Angles
From: Edwin W. Crandell
Re: Parent Questionnaire

Distribute - Friday, June 4

Return to Deputy Superintendent - Wednesday, June 9

Parents of students - Grades 3, 4, and 5

EXHIBIT E

INTER-OFFICE MEMO

Grand Blanc Community Schools
Grand Blanc, Michigan

Date June 1, 1971

To: Miss Vera Russell and Mr. Ron Angier
From: Edwin W. Crandell
Re: Parent Questionnaire

Distribute - Friday, June 4

Return to Deputy Superintendent - Wednesday, June 9

Parents of students - Grades 3, 4, and 5

EXHIBIT P

Grand Blanc Community Schools
Grand Blanc, Michigan

To: All 3rd, 4th and 5th Grade Teachers
Indian Hill School and Cook School
From: Edwin W. Crandell
Subject: Procedures for Administering Parent Questionnaires
Date: June 4, 1971

Your cooperation is solicited in administering the parent questionnaires in connection with the study currently being conducted in your school. Your attention to the details listed below will help to insure that the data sought can be collected most efficiently.

Materials

You will receive one parent questionnaire for each child, one room roster and one large envelope.

Points to Stress

It is important that each child understand the necessity for taking his questionnaire home to his parents and for returning it to you promptly. This will insure a high return and add significance to the data provided.

Procedures to be Followed

1. Distribute 1 questionnaire to each pupil in your room. Do not discuss the contents of the questionnaire. Send home on Friday, June 4.

2. Have each pupil mark his grade level and school in the upper right hand corner of the second page of the questionnaire.

3. When pupil returns the questionnaire to you, strike his name off the roster. Make every effort to have the questionnaire to you by Tuesday, June 8.

4. On Tuesday, June 8, turn in to the office all questionnaires in envelopes provided and all rosters. Be certain your name, grade level, and school is clearly marked on the outside of the large envelopes.

5. The school office will follow through as follows:

   a. Conduct a telephone follow-up of all names that have not been crossed off the roster.

   b. Receive all questionnaires that come in after follow-up has begun, insert questionnaires into proper envelope, and strike name from proper roster.

   c. Forward all questionnaires to the Deputy Superintendent on Wednesday, June 9.

Grand Blanc Community Schools
Grand Blanc, Michigan

To: All 3rd, 4th and 5th Grade Teachers
Indian Hill School and Cook School
From: Edwin W. Crandell
Subject: Procedures for Administering Parent Questionnaires
Date: June 4, 1971

Your cooperation is solicited in administering the parent questionnaire in connection with the study currently being conducted in your school. Your attention to the details listed below will help to insure that the data sought can be collected most efficiently.

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You will receive one parent questionnaire for each child, one room roster and one large envelope.

Points to Stress

It is important that each child understand the necessity for taking his questionnaire home to his parents and for returning it to you promptly. This will insure a high return and add significance to the data provided.

Procedures to be Followed

1. Distribute 1 questionnaire to each pupil in your room. Do not discuss the contents of the questionnaire. Send home on Friday, June 4.

2. Have each pupil mark his grade level and school in the upper right hand corner of the second page of the questionnaire.

3. When pupil returns the questionnaire to you, strike his name off the roster. Make every effort to have the questionnaire by Tuesday, June 8.

4. On Tuesday, June 8, turn in to the office all questionnaires in envelope provided and all rosters. Be certain your name, grade level, and school is clearly marked on the outside of the large envelope.

5. The school office will follow through as follows:

a. Conduct a telephone follow-up of all names that have not been crossed off the roster.

b. Receive all questionnaires that come in after follow-up has begun, insert questionnaires into proper envelope, and strike name from proper roster.

c. Forward all questionnaires to the Deputy Superintendent on Wednesday, June 9.

EXHIBIT G

COOK ELEMENTARY SCHOOL
Grand Blanc, Michigan

June 4, 1971

Dear Parents:

As you probably know, our school has been involved in a study this year. This study concerns teaching in grades three, four and five in two Grand Blanc Elementary Schools.

The attached anonymous questionnaire is an important part of the evaluation of the study. We solicit your cooperation in answering each question. Please return the questionnaire to school with your child prior to Tuesday, June 8.

If you find that either parent desires to answer a specific question differently, please indicate in a way known to us. For example, mother could respond with a lead pencil; father, with a pen. In any event, please label plainly any separate responses.

Your thoughtful and prompt consideration of this matter in the interest of Grand Blanc's school children would be much appreciated.

Sincerely,

Ronald Angles
Principal

RA:V

Enclosure

EXHIBIT B

COOK ELEMENTARY SCHOOL
Grand Blanc, Michigan

June 9, 1971

Dear Parents:

As you probably know, our school has been involved in a study this year. This study concerns teaching in grades three, four and five in two Grand Blanc Elementary Schools.

The attached anonymous questionnaire is an important part of the evaluation of the study. We solicit your cooperation in answering each question. Please return the questionnaire to school with your child prior to Tuesday, June 8.

If you find that either parent desires to answer a specific question differently, please indicate in a way known to us. For example, mother could respond with a lead pencil; father, with a pen. In any event, please label plainly any separate responses.

Your thoughtful and prompt consideration of this matter in the interest of Grand Blanc's school children would be much appreciated.

Sincerely,

Ronald Anglea
Principal

RA:k

Enclosure

EXHIBIT H

INDIAN HILL ELEMENTARY SCHOOL
Grand Blanc, Michigan

June 4, 1971

Dear Parents:

As you probably know, our school has been involved in a study this year. This study concerns teaching in grades three, four and five in two Grand Blanc Elementary Schools.

The attached anonymous questionnaire is an important part of the evaluation of the study. We solicit your cooperation in answering each question. Please return the questionnaire to school with your child prior to Tuesday, June 8.

If you find that either parent desires to answer a specific question differently, please indicate in a way known to us. For example, mother could respond with a lead pencil; father, with a pen. In any event, please label plainly any separate responses.

Your thoughtful and prompt consideration of this matter in the interest of Grand Blanc's school children would be much appreciated.

Sincerely,

(Miss) Vera W. Russell
Principal

VR:v

Enclosure

EXHIBIT B

INDIAN HILL ELEMENTARY SCHOOL
Grand Blanc, Michigan

June 8, 1971

Dear Parents:

As you probably know, our school has been involved in a study this year. This study concerns teaching in grades three, four and five in two Grand Blanc Elementary Schools.

The attached anonymous questionnaire is an important part of the evaluation of the study. We solicit your cooperation in answering each question. Please return the questionnaire to school with your child prior to Tuesday, June 8.

If you find that either parent desires to answer a specific question differently, please indicate in a way known to us. For example, mother could respond with a lead pencil, father, with a pen. In any event, please label plainly any separate responses.

Your thoughtful and prompt consideration of this matter is the interest of Grand Blanc's school children would be much appreciated.

Sincerely,

(Miss) Vera M. Russell
Principal

VR:v

Enclosure

EXHIBIT I

Grand Blanc Community Schools
Grand Blanc, Michigan

PARENT QUESTIONNAIRE

1. Would you prefer your child to have one rather than two or more classroom teachers during the school day? Why?

_____

_____

_____

2. How do you feel about the degree of emphasis our teaching this year placed on each of the following subjects:

	TOO LITTLE EMPHASIS	ABOUT RIGHT	TOO MUCH EMPHASIS
Reading	_____	_____	_____
	ABOUT RIGHT	TOO MUCH EMPHASIS	TOO LITTLE EMPHASIS
Mathematics	_____	_____	_____
	TOO MUCH EMPHASIS	TOO LITTLE EXPHASIS	ABOUT RIGHT
Social Studies . . .	_____	_____	_____
	TOO LITTLE EMPHASIS	ABOUT RIGHT	TOO MUCH EMPHASIS
Science	_____	_____	_____
	ABOUT RIGHT	TOO MUCH EMPHASIS	TOO LITTLE EMPHASIS
Spelling	_____	_____	_____
	TOO MUCH EMPHASIS	TOO LITTLE EMPHASIS	ABOUT RIGHT
Language	_____	_____	_____

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Social Studies . . .	TOO MUCH EMPHASIS	TOO LITTLE EMPHASIS	ABOUT RIGHT
Science	_____	_____	_____
Spelling	TOO LITTLE EMPHASIS	ABOUT RIGHT	TOO MUCH EMPHASIS
Language	_____	_____	_____
	ABOUT RIGHT	TOO MUCH EMPHASIS	TOO LITTLE EMPHASIS
	_____	_____	_____

3. To what extent, if any, has your child's interest changed in school this past year?

No change in interests	Greater interest in specific subject	Generally, interests have broadened	Fewer interests

Please explain: _____

_____

_____

_____

4. Have you noticed any attitude or behavior changes in your child which you would attribute to the teaching in school?

Very Desirable	Desirable	No change	Undesirable	Very Undesirable

Please describe in some detail.

_____

_____

_____

5. How many parent-teacher conferences have you had this year about your child?

0 _____ 1 _____ 2 _____ 3 _____ 4 or more _____

6. How well do you feel the school has provided for your child's learning this year?

Very Well	Well	Average	Poorly	Very Poorly

Please explain in some detail.

_____

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7. Please comment on any other aspect of your child's instructional program you feel is important . . . . . good or bad.