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ABSTRACT

This study was a 2-year comparison of the effects of open classroom versus traditional instruction on children's self-concept, attitudes toward school and achievement of basic skills. The 250 participants were students in grades 1-6 of two elementary schools -- one utilizing an open classroom approach and the other a traditional approach. The measurement instruments used included the Piers-Harris Self-Concept Scale and the Pictorial Self-Concept Scale, the "Faces" Inventory, and the Stanford Achievement Test. Pretests on the three variables were administered in May and June of 1972 and posttests were administered in May and June of 1974. In addition, data related to teacher attitudes and classroom environment and practices were collected and analyzed. The results of an analysis of covariance did not provide support for any conclusive comprehensive statements concerning the relative effectiveness of the open or the traditional instructional program. However, there was evidence to suggest that the open classroom instructional program effected positive changes in the affective areas of self-concept and attitude toward school. Students in both instructional programs performed equally well in the achievement of basic skills. (JMB)

Open Classroom/Traditional Education:

A Two-Year Comparative Evaluation

Pennsylvania Department of Education 1975

A TWO-YEAR EVALUATION OF THE COMPARATIVE EFFECTS OF AN OPEN CLASSROOM INSTRUCTIONAL PROGRAM AND A TRADITIONAL INSTRUCTIONAL PROGRAM

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ABSTRACT

In recent years there has been widespread criticism of the traditional mode of instruction in American public schools. Concurrently, there have been attempts to replace the traditional organization and instructional patterns with alternatives. Perhaps the most widely publicized and implemented of these alternatives is open classroom education. The proponents of this type of innovative program say that open classroom education will effect positive changes in children's self-concepts, attitudes toward school and cognitive learning, but these claims have not been substantiated by empirical research evidence. This study, limited to a comparison of one open school and one traditional school, was performed to empirically assess the claims of open classroom proponents.

Approximately 250 students in grades 1 through 6 of two elementary schools, one utilizing an open classroom instructional program and the other a traditional instructional program, comprised the sample in the two-year study which focused on the assessment of the comparative effects of the two instructional programs upon three student variables: (1) self-concept, (2) attitude toward school, and (3) achievement of basic skills. Measurement of these variables was accomplished by the use of the Piers-Harris Self-Concept Scale and the Pictorial Self-Concept Scale, the "Faces" Inventory, and the Stanford Achievement Test. Pretests on the three variables were administered in May and June of 1972; posttests were administered in May and June of 1974. Analysis of covariance was used with this data. In addition, data related to teacher attitudes and classroom environment and practices was collected and analyzed.

The results of the study do not provide support for any conclusive comprehensive statements concerning the relative effectiveness of the open or the traditional instructional program. However, there was evidence to suggest that the open classroom instructional program effected positive changes in the affective areas of self-concept and attitude toward school. Students in both instructional programs performed equally well in the achievement of basic skills.

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CHAPTER I

INTRODUCTION

Background of the Study

James Welsh, writing an introduction to a description of Pennsylvania's Educational Quality Assessment program, says that "public schooling in America historically has been shrouded in faith and optimism. Until less than a decade ago, the promise and power of formal schooling were rarely questioned." (Welsh, 1971, p. 1) However, as Welsh indicates, the situation has changed during the past decade. The educational literature is replete with the recent writings of a growing number of authors, commissions, and committees which are sharply critical of the public educational system of this country. These attacks and criticisms are too numerous to ignore and, taken together, constitute an indictment of traditional educational practices.

For instance, the National Education Association's Center for the Study of Instruction, in its staff report entitled Schools for the 70's and Beyond: A Call to Action, criticizes the traditional "uniform environment" of most classrooms by saying that it "...ultimately bores learners by aiming all instruction at a nonexistent 'average' student." (Greenleaf, et.al., 1971, p. 49) John Holt sounds the same chord by bluntly saying that "almost all children are bored in school." (Holt, 1970, p. 68)

Postman and Weingartner condemn the irrelevant and boring nature of the "game" of schooling in a rather unique way:

> The game is called "Let's Pretend," and if its name were chiseled into the front of every school building in America we would at least have an honest announcement of what takes place there. The game is based on a series of pretenses which include: Let's pretend that you are not what you are and that this sort of work makes a difference to your lives; let's pretend that what bores you is important, and that the more you are bored, the more important it is; let's pretend that there are certain things everyone must know, and that both the questions and answers about them have been fixed for all time; let's pretend that your intellectual competence can be judged on the basis of how well you can play Let's Pretend. (Postman and Weingartner, 1969, p. 49)

Charles Silberman, one of the most widely cited critics of traditional American education, says:

> ...schools discourage students from developing the capacity to learn by and for themselves; they make it impossible for a youngster to take responsibility for his own education, for they are structured in such a way as to make students totally dependent upon the teachers. Whatever rhetoric they may subscribe to, most schools in practice define education as something teachers do to or for students, not something students do to and for themselves, with a teacher's assistance. (Silberman, 1970, p. 185)

Such criticisms are legion and could be cited endlessly. However, a more important concern is the question of how the quality of American education can be improved. An often encountered answer to this question is that educational

systems should be less structured and more responsive to individual diversity. It is said that schools should have "less formally structured classrooms in which the student can develop more or less unhindered by demands for conformity." (Averch, et.al., 1971, p. 140)

A form of the "less structured classroom" which is receiving much attention at this time in America, especially at the elementary level, is one that has variously been termed "British Infant School," "open education," "integrated day," "Leicestershire Plan," and "informal classroom." (Barth, 1971)

Advocates of this type of instructional organization believe that their programs will result in children having more positive attitudes toward school. Because children's personal interests largely determine the activities in which they will be involved, they should not perceive school as boring or irrelevant. School should be an enjoyable, interesting place where rewarding and "fun" experiences occur. Further, the warm and trusting environment of the open classroom should assure that children will feel accepted, will not fear undue criticism and will be encouraged to attempt, and to succeed in, activities they are capable of performing. School, then, should be perceived as a likeable place, not just a tolerable place. (Rogers, 1969)

Open education advocates also say that the children's attitude toward themselves, their self-concept, is expected to become more positive for many of the same reasons. The warm, supportive classroom environment is seen to be especially important in this regard. Children should quickly learn that they are accepted for what they are, not criticized for being other than what they should be. As they succeed in self-initiated and self-directed activities, they gain a feeling of confidence. They see themselves as competent, self-reliant, autonomous individuals, capable of making decisions and exercising responsibilities. In this way, they develop a realistic and positive self-concept. (Rathbone, 1971)

In addition to these affective considerations, the effects of the open classroom may favorably influence cognitive achievements. Although there is little emphasis upon rote memory and the learner's interests to a great extent dictate what is studied, the basic skills and knowledge in reading, writing, mathematics and other subject areas are expected to be attained. (Rogers and Coe, 1971)

The attractiveness of these claims, combined with the dissatisfaction with traditional forms of instruction as espoused by its many critics, has led to the rapid and widespread implementation of open classroom instructional programs. Frank Brunetti, analyzing school architectural trends in 43 states, reports that more than 50 per cent of the 2,500 schools built in 1967, 1968 and 1969 were of open design. (Brunetti, 1971) The State of North Dakota has implemented an ongoing plan to retrain all of its elementary teachers in open methods. In Pennsylvania alone, there are more than 40 open space buildings either operating, under construction, or in the design phases. (Warner, 1972) Many other schools have adapted or are adapting open education philosophy and programs to existing buildings with minor or no renovations.

However, as is often the case, this implementation of open classroom programs has been carried out mainly as a result of a "bandwagon" effect, with little justification from research. As Lillian Katz says:

> Reasons for such widespread interest, by now reaching proportions of a bandwagon are no doubt many and varied...Certainly the general dissatisfaction with so-called traditional (i.e. formal)

> schooling and the resulting readiness to 'try anything' may be working behind the groundswell. Possibly a long-standing Anglophilism contributes to America's receptivity to British developments as well. Notably, a body of evidence that open informal education is effective is not available, and is not among the many causes of the spreading enthusiasm. (Katz, 1972, p. 3)

Roland Barth, a leading advocate of open education is more specific when he writes that "Despite the mass of information accumulating about open education, there is still no rigorous research concerning its effect upon the development of children's thinking, attitudes and behavior as compared with the effects associated with more traditional forms of education." (Barth, 1971, pp. 117-118) Walberg and Thomas agree: "...There has been very little research and evaluation on open education, aside from testimonials by exponents and reporters." (Walberg and Thomas, 1972, p. 197)

Thus, there is a definite need for evidence generated from research and evaluation to support or refute the claims of the proponents of open classroom education. If this instructional strategy is truly a viable alternative to more traditional forms of instruction, this viability should be established by means of objective, empirical evidence derived from scientific research.

The purpose of this study was to compare the effects of an open classroom instructional program with the effects of a traditional instructional program in two elementary schools in Manheim Central School District, Lancaster County, Pennsylvania, during the 1972-73 and 1973-74 school years.

Statement of Objectives

The major objective of the study was to attempt to answer the following questions:

1. Is there a significant difference between the self-concept of children involved in an open classroom instructional program and those involved in a traditional program?

2. Is there a significant difference between the attitudes toward school of children involved in an open classroom instructional program and those involved in a traditional program?

3. Is there a significant difference between the level of achievement in basic skills of children involved in an open classroom instructional program and those involved in a traditional program?

4. Does teaching in an open classroom cause a change in teacher attitudes toward child-centered policies and practices in education?

5. What is the extent of the changes in classroom environment and practices resulting from continued experience with the open classroom?

Related Literature

Although Lillian Katz (1972) and Walberg and Thomas (1972) accurately characterized the overall research situation in the area of open education when they wrote of a lack of a coherent body of research evidence supporting its effectiveness, the number of reports in the literature concerning studies of the effectiveness of open education has increased rapidly as interest in the approach has increased. However, a strong theme of caution concerning the appropriateness of generalizing results is expressed in most of these studies. Because of the flexibility and impreciseness of open education programs and the "pilot" nature of many of the studies, it is emphasized that general statements about the effects of open education should not be made.

Though the original impetus for the implementation of open education in America came from the British experience with informal primary schools, it does not appear that evidence of clear-cut superiority in cognitive achievement is available for these schools. Douglas Pidgeon, after reviewing relevant English studies, says that "Direct evidence of the efficiency of the new British primary school, compared with the more traditional approach to primary education, is currently in short supply..." (Pidgeon, 1972, p. 31) Joseph Featherstone, being more specific about the same subject, says that

> ...on measurable achievement in conventional tests, children in formal classes do slightly better than children in informal classes. Uniformly, the differences are slight. The greatest are in mechanical arithmetic, and the least in reading. (Featherstone, 1972, p. 40)

Featherstone goes on to say that this difference can be explained by the fact that formal classroom children have more experience in taking formal tests than those in informal classrooms. Further, he reports that there is some evidence to show that the differences tend to "iron out" in later school years.

The Canadian and American studies reported in the literature generally do not indicate any meaningful pattern of results. Some of the studies indicate that students in conventional or traditional schools do better on standardized achievement tests than comparable students in open situations.

Jack Sackett, for instance, found that, compared on the basis of the Iowa Tests of Basic Skills, children in an open space school achieved significantly lower than the comparison groups from both a self-contained school and a departmentalized school. (Sackett, 1971) Moodie, in his study of approximately 370 Canadian children, found that when children from open plan and traditional elementary classes were compared on the basis of Gates-MacGinitie Reading Test scores during 7th grade, the results indicated that the open school students attained lower scores than the students from the more traditional classes. Surprisingly, however, when the same groups of students were tested 14 months later, the differences were no longer evident. (Moodie, 1971). McRae, in an almost identical study with another sample of 70 students, reported very similar findings. (McRae, 1970)

A larger number of the studies concerning cognitive achievement indicates that there is essentially no difference in the achievement of traditional and open school students. Tuckman, et.al., report that a comparative study of achievement of 30 classrooms of students, 16 from open schools and 14 from traditional schools, in grades 1 through 5 resulted in no discernible pattern of differences. Although several of the 16 difference comparisons performed using results of California

Achievement Tests revealed significant differences between the groups, these could not reasonably be described as program effects. "Overall, it was concluded that standardized achievement was unaffected by the switch to open classroom; it was neither improved nor retarded." (Tuckman, et.al., 1973, p. 9)

More positively, Charles Killough's report of a three-year longitudinal study indicates that students from schools with open programs scored significantly higher on cognitive achievement measures than students from traditional program schools. Killough's evenly divided sample of approximately 270 elementary students was randomly selected and given a pretest and yearly posttest for three years. At the end of the second year, the open program students had significantly higher mean scores in arithmetic reasoning, arithmetic concepts, arithmetic computation, reading comprehension and vocabulary. Killough reports that differences were maintained through the third year of the study. (Killough, 1971)

The results of these studies are somewhat contradictory, but it appears that open education programs have not been demonstrated to be either clearly inferior or superior to traditional education programs in relation to their effects upon children's cognitive achievement. The present situation is summarized rather concisely by Frank Stetz in his American Educational Research Association paper:

> To date, very few large scale endeavors to assess student achievement in open education have been completed. Studies which have been done have not shown the increased gains over more traditional programs which was hoped for. (Stetz, 1974)

Since the claims of the proponents of open education emphasize results in affective areas, a good number of the studies in the literature deal with these types of variables.

The self-concept of children is one of the primary affective variables that open education advocates believe will be positively affected by participation in open instructional programs. Thus, a good number of the studies in the literature has addressed the question of whether involvement in open education program results in improved self-concept.

One of the earlier reports in the literature concerns a comparative study of self-concept of elementary students in a traditional school and an experimental, open school. Purkey, Graves and Zellner administered the Coopersmith Self-Esteem Inventory to 414 experimental pupils in grades 3, 4, 5 and 6 and 525 pupils in the same grades in the traditional school in order to investigate two hypotheses:

1. Pupils enrolled in the experimental school will evidence greater self-esteem than pupils enrolled in the comparison school.

2. As grade level increases, measured differences in self-esteem between the two groups of pupils will increase. (Purkey, Graves and Zellner, 1970)

The first hypothesis was supported at the .001 level of significance. The second was also supported, since differences between the schools at each grade level were significant at the .01 level and the magnitude of differences increased as the grade level increased. These results are quite encouraging, although their validity is somewhat weakened by the "static group" nature of the design. Although the authors make a strong case for the equivalency of the two schools in relation

to nontreatment variables, such matching is generally suspect.

Heimgartner also finds support for the contention that open education programs will have a more positive effect upon children's self-concept than traditional programs. In a comparison of 216 elementary students, approximately evenly divided between a traditional school and an open school, on the basis of scores on the Self-Social Symbol Tasks and the Children's Self-Social Constructs Test, he found that during the course of a year the open school group had experienced increase in self-esteem while the traditional group showed a slight loss. (Heimgartner, 1972)

Wilson, Stuckey and Langevin conducted a study which further supports the effectiveness of open education programs. They compared 104 grade 5 and 6 pupils in two open schools with 59 grade 5 and 6 pupils from two traditional schools on the basis of a semantic differential questionnaire with the following six concepts: books, learning, teacher, I, school, and school last year. The results of their analysis led them to conclude that "the results generally confirm the claims that pupils in open plan schools have better attitudes toward school and toward themselves." (Wilson, Stuckey and Langevin, 1972, p. 117)

Other studies investigating the relationship of open education and pupil self-concept have not been as supportive of the claims for open education as those cited above. Kohler, (1973) on the basis of the Sear's Self-Concept Inventory, compared 126 children from 9 to 12 years old from three open schools with 156 children in the same age groups from three traditional schools. He also attempted to relate the degree of openness of the schools, as measured by the Walberg-Thomas scale described earlier herein, to the variable of self-concept. His findings indicated that there was no difference between the self-concept of students in the two types of schools on the total score or any of the five subscale scores. Further, he found no significant correlation between degree of openness and self-concept.

Ruedi and West also report finding no difference between the self-concepts of open and traditional groups. After examining the results of Gordon's How I See Myself Scale for children from the two schools, they concluded that "the idea that students in an open environment school would be higher in self-concept....was not demonstrated." (Ruedi and West, 1972, p. 10) They strongly emphasize, however, the limitations of their study, the primary one being a sample size of 27.

The improvement of children's attitude toward school is also a major affective objective of open education advocates, since enjoyment in school and the learning situation is assumed to be the primary motivational factor which influences elementary children. Logically, given the comparative freedom of choice and lack of obtrusive structure in open programs, it would appear the children's attitudes toward school should be positively affected by involvement in open instructional programs. The studies in the literature lend support to this impression.

The study reported by Wilson, Stuckey and Langevin, described in detail earlier, indicates that the experimental, open school children responded to the semantic differential concept "school" more positively than the traditional students. As the authors say, "In all cases, the attitude of the open plan pupils was more positive than the controls. School is more active, potent, and likeable." (Wilson, Stuckey and Langevin, 1972, p. 117) The study by Tuckman, et.al., also described earlier, reported similar findings concerning attitude toward school. The comparisons made between open and traditional pupils indicated that, as measured by the School Sentiment Index, the open classroom students had more positive attitudes

toward school. This difference was noted in both the primary and intermediate grades. (Tuckman, et.al., 1973)

A study performed in Ontario, Canada also supports the contention that there is a strong relationship between open programs and positive attitudes toward school. (Halton County Board of Education, 1969) Observational techniques and administration of questionnaires in both an open and a traditional school led to the conclusion that the attitude toward school of the open school students was more positive than that of the traditional school students. Interestingly, it was also reported that school attendance was higher in the open school group. This was seen as an unobtrusive reflection of a more positive attitude toward school.

As has been stated, the literature concerning the effects of open education programs on children does not provide conclusive evidence of either its success or its failure. However, two rather strong impressions emerge from a review of such literature. First, it appears tenable to say at this time that there is little evidence to indicate that there are seriously negative effects which can be attributed to open instructional programs. Given the relative recency of the implementation of most open programs, this situation is encouraging.

The second strong impression gained from a review of the literature on open education is that there is a definite need for more studies in this area. Overall, the literature indicates that a determination of the comparative effectiveness of open education programs has not been made and there is an often-stated desire for more research to make such a determination possible.

CHAPTER II

PROCEDURES

Included in this chapter are six sections. The first section describes the characteristics of the sample involved in the study. The second considers the design of the study. The third major section describes the instructional programs used in the comparison and experimental schools, with emphasis upon the open classroom program. The next section presents descriptions of the instruments used in the study, with reliability and validity information emphasized. Finally, procedures utilized in data gathering and statistical analysis are presented in the last two sections of the chapter.

Sample

The study was conducted in Manheim Central School District, Lancaster County, Pennsylvania, and involved two similar elementary schools. Sporting Hill Elementary School was the experimental school, having been remodeled during the summer of 1972 to facilitate the implementation of an open classroom instructional program. White Oak Elementary School was the comparison school. The two schools, in terms of physical plant, are very similar since both were built from the same set of architectural plans approximately 20 years ago. Both schools have six regular teachers, one teacher's aide and approximately 150 students in grades 1 to 6. Both serve rural populations living on farms or in very small towns.

A major dissimilarity in the two schools in the study which should be pointed out is that during the 1972-73 year Sporting Hill, the open classroom school, had six student teachers in the fall semester and another six in the spring semester from Millersville State College. During the 1973-74 year, Sporting Hill had four student teachers in the first semester and two during the second. White Oak, on the other hand, did not have any student teachers during either of these years.

Design

The design used in the study was a modification of the Nonequivalent Control Group Design as described by Stanley and Campbell. (1966, pp. 47-50) Because of the usual administrative constraints, neither random assignment of students to treatments nor random assignment of school to treatment was possible.

However, except for the designed openness of the experimental school, the two schools are quite similar in terms of physical plant, number of grades, classes per grade and experience of teachers. Because both are neighborhood schools drawing pupils from very similar types of families and residential areas, it is believed that there was no inherent bias in terms of socioeconomic status or ability level of students. Thus, except for the type of instructional program, the experimental and comparison students were felt to be equivalent. Accordingly, the statistical unit of measurement used was the individual student scores. The design of the analysis used in the study generally may be pictured as follows, where O is observations or measurements and X is experimental treatments.

Schools	May 1972		May 1974
Sporting Hill	O	X	O
White Oak	O		O

Treatments

Comparison Treatment. The comparison treatment was basically a typical self-contained classroom type of instructional program with designated time periods for the normal subject matter areas.

Experimental Treatment. The experimental treatment was an open classroom instructional program based on a model designed and implemented by the personnel of the Educational Development Center at Millersville State College, Millersville, Pennsylvania. This method of open classroom instruction emphasizes the following components (as described in the brochure distributed by Millersville State College):

a. Team Teaching
Team teaching is planning, working and evaluating together in order to provide the best possible learning experience for youngsters. Planning and evaluating are the key factors of team teaching. Without these elements, team teaching cannot function effectively. Teachers must freely communicate with each member of the team. Teams should be designed so that the strengths and interest of each team member are used to their greatest potential.

b. Individualization
Individualization means teaching a child at his present level of achievement. It can mean instruction to a large group, instruction to a small group, and in some instances a one-to-one situation. Individualized instruction means humanizing, personalizing, and caring for each child as a human being. It means recognizing and building on each child's capabilities and limitations. It means making each child feel he is important and has something to contribute.

c. Nongradedness
Nongradedness eliminates the traditional labels of 1st grade, 2nd grade, etc. Children move through the various basic skills without the constraints of grade levels. Each child can move at his own rate without the constant fear of failure. This is made possible through revised grouping procedures. Multiaged groups are developed at the primary and intermediate levels. This type of grouping allows for interaction between children of different ages and abilities--interaction that knocks down the barriers that normally separate our children--barriers that allow a child to get some perspective of his growth and development in relation to other people.

d. Continuous Progress
This system of curricular organization places a child in a level that reflects his educational development through a sequence of learning skills. Each child's placement is determined through the use of diagnostic tests and instruments and controlled by a record-keeping system. The major emphasis of such a system is flexibility.

e. Unified Media
Unified media is an integral part of the program in which instructional and other services related to print, nonprint, audio-visual media, manipulative devices, and "hands on"

activities and materials are administered in a single, unified program.

A typical learning day was as follows.

7:50 - 8:15 Opening Exercises

The opening exercises of the school day usually find all the children in their home base. At this time lunch count is taken, beginning exercises are conducted, the daily schedule is discussed and special activities are arranged. Occasionally, when a child or group of children have completed a major project they wish to share with the other children, the complete unit (primary or intermediate) will come together to observe. Generally, though, this time of day is used as a sort of launching pad from which the day's activities flow.

8:15 - 9:45 Language Arts

During this time, such areas as spelling, creative writing, speaking, dramatics, English and reading are covered. Within each unit the group is determined by evaluation of the child's progress and may, and often does, cut across grade levels (1, 2, 3 for the primary unit and 4, 5, 6 for the intermediate). Here children might be taught by large-group instruction for a new skill, small group instruction for a review of a previously taught skill, or by themselves on individually prescribed tasks. Children work and progress at their own rates. The child is constantly reevaluated in all the language arts area and reassigned to different groups and teachers, depending on his progress. The major emphasis at all times is upon individualization of instruction based on each child's unique set of abilities and needs.

9:45 - 10:45 Math

Again, the groupings and assignments to teachers are based upon children's level of achievement rather than upon age of grade level. The beginnings of class will find the teacher and children making plans for math that day. Problems are exchanged for later solutions. There might be instruction to the whole group on a new concept. Times may be posted for small group meetings. And, those children who are capable of working on their own are allowed to go their own way.

11:00 - 12:00 Lunch

The lunch hour is an integral part of the day, in that it allows time for children to romp freely, exercise with games organized and decided upon by the children and teacher, and pursue interests, initiated in the classroom, that the children might not otherwise find time for during the regular school day.

12:00 - 2:15 Social Studies and Science

The social studies-science block of time in the afternoon provides a great many opportunities for the children and teacher to discuss, develop and explore the tremendous variety of interests of the children. Learning centers, work packets, committee work and individual research work are a few facets of the learning process that can be seen here.

Large groups are gathered for instruction in a concept new to most of the children. Small groups are organized for review work, setting new courses, for evaluation of progress, etc. And, as always, the individual child can be seen

pursuing his or her own interests at his or her own rate of speed. The teacher, in this setting, becomes a consultant, a helper, a guide, a diagnostician--facilitator of learning.

A key element in the Sporting Hill Elementary School instructional program is the system of individual contracts between teacher and child. This system, used in varying degrees in all the subject areas, is seen as a major way of individualizing instruction and allowing the learner to initiate and guide, and be responsible for, his or her own activities.

Under the contract system, children confer individually with their teachers and agree to master within a given period of time a certain skill or perform a certain amount of work, such as preparing and giving a report, understanding a scientific concept, solving a certain number of math problems, or reading a book. Each of the six regular teachers in the school is responsible for working out contracts with approximately 25 children. Each teacher is responsible to make certain that each child covers certain subject areas such as reading, math and science. These contracts, depending upon the nature of the child, vary in complexity and time and can be as short as two or three hours or as long as two weeks. Within certain limits, determined by the teacher's assessment of the child's need, the individual learner can decide the type of contract he or she will enter into, thus exercising some influence over his or her own activities.

Instrumentation

Self-Concept. Assessment of the comparative effects of the instructional programs upon the self-concept of children was accomplished by the administration of the Pictorial Self-Concept Scale (grades 1 through 4) and the Piers-Harris Children's Self-Concept Scale (grades 5 and 6). Both instruments were based upon the theoretical definition of self-concept proposed by Jersild. (1952)

The Pictorial Self-Concept Scale developed by Bolea, Felker and Barnes (1971) consists of 50 cartoon-like picture cards (Appendix A-1). The children sort the cards into one of three piles (distinguished by three larger, differently colored background sheets), according to whether the figure designated by a star is like him/her, sometimes like him/her, or not like him/her at all. Cards on which the central figure is a female are used with girls and cards on which the central figure is a male are used with boys. A split-half reliability of .85 with 1,813 subjects is reported by the developers. In addition, they cite six studies which provide evidence of the validity of the instrument, one of which is a correlation between scores on their instrument and the Piers-Harris instrument ($r = .42$, $N = 63$ elementary pupils, significant at less than .01 level).

The Piers-Harris Children's Self-Concept Scale (Appendix A-2) was found to evidence internal consistency reliability, both split-half and a K-R 21, of .90 with two separate administrations to 6th grade pupils and one administration to 3rd grade pupils. Test-retest reliability after four months for pupils in grades 3, 5 and 6 was reported to be .71 or higher. Five studies which support the validity of the instrument are reported in the test manual. (Piers and Harris, 1969)

In addition to these two instruments, two of the items on the questionnaire administered in May 1974 (Appendix D-2) to the parents of the open classroom school asked for the parents' perception of their child's self-concept. The responses to these items were used in the assessment of this variable.

Attitude Toward School. Assessment of the comparative effects of the programs

upon the children's attitudes toward school was accomplished by the administration of the "Faces" test (Appendix A-3), an attitude inventory developed by personnel in the Division of Research of the Pennsylvania Department of Education and Millersville State College to evaluate the 1971 and 1972 "Summer Happenings." (Anttonen, 1972)

Based on a factor analysis of findings gathered with a longer form of the instrument during the 1971 "Summer Happening" by George Brehman, Division of Research, Bureau of Information Systems, PDE, the "Faces" instrument yields a total score and scores on three factors: (1) attitude toward school climate, (2) attitude toward independent study and (3) attitude toward school learning. (Brehman, 1972) Analysis of the instrument based on the June 1972 pretest of 256 students shows an internal consistency reliability (coefficient alpha) of .82 for the total score. Analysis for the same sample shows coefficient alpha reliabilities for the factors of: (1) attitude toward school climate--.80, (2) attitude toward independent study --.62 and (3) attitude toward school learning--.66. Both total scores and factor scores are included in the statistical analysis.

In addition to the "Faces" instrument, two other measures of attitude toward school were used. The first of these was a record of days of attendance, with the expectation that more positive attitudes toward school would be reflected in a lower rate of absence.

In addition, during January 1973 the students at Sporting Hill School and their parents were requested to complete questionnaires (Appendix D-1) with queries concerning their feelings about the open classroom school. Further, a second parent questionnaire (Appendix D-2) was administered during May 1974. The responses were seen as being reflective of attitude toward school.

Academic Achievement. The Stanford Achievement Test battery was used to assess the comparative attainment of basic skills. Split-half reliabilities for the subtests included in the battery for grades 1 through 6 are all .71 or higher with most of them being above .85.

Teacher Attitudes. Teacher attitudes were measured by Lindgren and Patton's "Opinnionnaire on Attitudes Toward Education." (Shaw and Wright, 1967) Essentially, the instrument measures teacher attitudes toward the desirability of using authoritarian methods and the desirability of subject-matter-centeredness versus learner or child-centeredness. A corrected split-half reliability of .82 has been reported for the questionnaire (Appendix A-4), along with four studies supporting its validity.

The major reason for the use of this instrument was to attempt to discover any change in teachers' attitudes which might be produced as a result of their involvement in the program. It would appear that their perception of the value and success of the innovative program would be reflected in their responses to the questionnaires, thus providing further evidence for determining the program's effectiveness.

Classroom environment and practices. Assessment of this area was accomplished through use of an observation rating scale (Appendix A-5) developed by the Educational Development Center, Inc., Newton, Massachusetts. (Walberg and Thomas, 1972) Originally created for use as a research tool, the instrument has shown that it can reliably discriminate between "traditional" and "open" classrooms.

The most appropriate use of the instrument, according to its developers,

is as a survey instrument in a school system which is beginning to experiment with open education. It is suggested that the instrument be used to gather baseline data against which future data collected with the instrument can be compared. This suggestion was adhered to and in this way the changes in classroom practices and environment in both schools were assessed.

A further use of the instrument was to determine if there was a difference in the degree of "openness" between the classroom environment and practices of the open classroom school and those of the traditional school.

Data Gathering Procedures

Pretests on the "Faces" inventory and the self-concept instruments were administered during the latter part of May and the first week of June 1972. The "Faces" inventory was administered in late May by district personnel for their own evaluation purposes, so rather than duplicate the testing, the results of their administration were used in this study.

The self-concept instrument for grades 1 through 4 (Pictorial Self-Concept Scale) was administered to all the pupils in the study by the principal investigator. In all cases, administration took place in the normal classroom environment with the regular classroom teacher assisting the principal investigator.

The self-concept instrument for grades 5 and 6 (Piers-Harris Self-Concept Scale) was administered to their classes by the regular classroom teachers. The pretest administration of both these instruments took place during the morning of June 5, 1972 in the comparison school and the morning of June 6 in the experimental school.

The teacher attitude opinionnaires were given at the time of the self-concept testing to the principals of the two schools in stamped, addressed envelopes for distribution to the teachers, who completed and mailed them to the investigator.

The IQ scores on the Otis-Lennon Mental Ability which were used as the covariate in the achievement segment of the analysis for grades 2 through 6 were available in the district files. In cases where more than one score was available, the score received on the most recent administration was used.

The posttest administration of the "Faces" inventory and the two self-concept instruments followed essentially the same procedures as those used during pretesting. The only major difference was that formal written directions for administration and sample items were prepared and used with the "Faces" inventory, which were administered by the individual classroom teachers. These were administered during the week of May 20-24, 1974. The two self-concept instruments were administered in the same manner by the same people who had done the pretesting, with the experimental school tested during the morning of May 22, 1974, and the comparison school during the morning of May 23, 1974.

Once again, the teacher attitude questionnaires were given to the two principals for distribution and were later completed and mailed by the individual teachers to the investigator.

The Stanford Achievement Test was administered by the individual classroom teachers during the week of May 6-10, 1974. They were asked to adhere to the suggestions given in the manual of administration directions prepared by the test published. All the teachers involved in the study had prior experience in the administration of achievement test batteries.

The classroom observation data used to assess the comparative degree of openness of the two instructional programs was collected at periodic intervals throughout the two school years. During the first year, the first observation was performed approximately a month after the start of the school year and the remaining five at approximately six-week intervals thereafter. During the second year, eight sets of observations were performed at approximately equal intervals. Thus for each classroom in the two schools, there was a series of 14 observations.

Although the openness of the Sporting Hill building did not allow the clear-cut delineation of classroom groups that was provided by the self-contained classroom arrangement of the White Oak building, it was possible during each of the 14 observation days to observe each teacher in the experimental school interacting with a class-sized group. It was in this type of situation that the observation rating scales were completed.

The attendance data used as a measure of attitude toward school were secured from the district's official attendance registers for the 1971-72 and the 1973-74 school years. The parent and pupil questionnaire data were taken from questionnaires administered by district personnel during January 1973 and May 1974.

Statistical Analysis

The basic statistical method used to compare the first year results of the two programs was analysis of covariance. For the "Faces" inventory of attitude toward school and the two self-concept instruments, the scores on the pretests administered in June 1972 were used as covariates of the scores on the same instruments administered as posttests in May 1974. Since it was not possible to administer the Stanford Achievement Test in June 1972, IQ scores on the Otis-Lennon Mental Ability Test were used as a covariate on the scores of the Stanford Achievement Tests administered in May 1974. Otis-Lennon IQ scores for nearly all the students in the sample were available in the districts files. The days of attendance data used as covariate and criterion were secured from the district's official attendance registers.

In order to increase the accuracy of the covariance analyses performed, a technique suggested by Andrew Porter (1971, pp. 17-20) was utilized. This technique, in Porter's words, "substitutes an estimated true score covariable for the observed fallibly measured covariable and then employs classical ANOVA procedures." (Porter, p. 17) Essentially, the procedure requires that individual covariate scores be adjusted on the basis of the reliability of the covariate instrument by use of the following formula:

$$\hat{T}_{ij} = \bar{X}_{.j} + p_{xx}(X_{ij} - \bar{X}_{.j})$$

where

$\hat{T}_{ij}$ is the "true score"

$\bar{X}_{.j}$ is the mean of the covariate

p_{xx} is reliability of the covariate

$\bar{X}_{ij}$ is an observed score

The following example illustrates the technique. If the reliability of a covariate is .90, the group mean is 100 and a pupil received an observed score of 85 on the covariate, then his/her "true score" would be derived as follows:

$$\hat{T}_{ij} = 100 + .90\ (85 - 100)$$

$$\hat{T}_{ij} = 100 + .90\ (-15)$$

$$\hat{T}_{ij} = 100 - 13.5$$

$$\hat{T}_{ij} = 86.5$$

The effect of this procedure is to bring the extreme scores in a group closer to the mean of the group, thereby reducing the variability of the group's scores. Consequently, it is more difficult to obtain a spurious significant difference when the covariance analysis is performed. In this study, all covariate scores, with the exception of days of attendance, where the adjustment was not relevant, were adjusted by the use of the above procedure.

Where possible, the analyses of covariance were performed in factorial designs using experimental treatment and grade level as the factors involved. There were several reasons for this, the major one being economy. With subscale as well as total scores being analyzed, the number of separate analyses would have been well over 100 had individual subscale-by-grade-level analyses been performed. Further, had this large number of independent comparisons been performed, it is possible that several would have been significant by chance alone, thus complicating interpretation of results. In addition, the information gained concerning grade level differences, although secondary to the primary comparison involved in the treatment factor, i.e., open classroom program vs. traditional program, is felt to be of value. Finally, it is possible, by the use of this design, to assess the statistical significance of the interaction of grade level and treatment program, further information felt to be of value.

The self-concept segment of the statistical analysis was performed by the use of a 2 x 2 factorial for grades 5 and 6. Since there was no pretest available for grade 1, a simple analysis of variance was used to compare the posttests of the two groups at that level.

The analysis for the grades 1-4 consisted only of a total score comparison between the two treatments since the Pictorial Self-Concept Scale yields only a single, overall score. The analysis for grades 5 and 6 included a comparison of six subscale scores as well as a total score.

The attitude-toward-school segment of the statistical analysis involved the comparison of two measures, the primary one being the "Faces" inventory. The analysis of this instrument was performed through the use of a 2 x 4 factorial design with grades 3 to 6 included.

Again, there was no pretest data for grade 1, so a simple analysis of variance on the posttests was performed. The grade 2 analysis was completed with a one-way analysis of covariance. For some reason, possibly a testing anomaly or a lack of understanding on the students' part, the internal consistency reliability of

the "Faces" inventory obtained in the 1972 pretest with these groups was unsatisfactory, so the administration of the instrument could not validly be used as a covariate. Thus, data obtained in a May 1973 testing with the "Faces" inventory was used as a covariate in the analysis of this grade's data.

The analysis of the "Faces" instrument for all grades involved comparisons of three subscale scores and a total score.

The second measure which was involved in the attitude-toward-school segment of the statistical analysis was days of attendance. Here again, grade 1 was analyzed separately via a one-way analysis of covariance. Since only one-year data were available for this grade and two-year data were available for the other five grades, it was felt that it should be analyzed independently. The other grades were analyzed in two factorials, a 2 x 2 for grades 2 and 3 and a 2 x 3 for grades 4-6.

In the academic achievement segment of the data analysis, factorial analyses were not performed. Because grade-level scores on the Stanford Achievement Tests were used as criterion measures but were not available for use as the covariate, IQ scores were used. This resulted in a situation where the covariate IQ scores for all six grades were expressed on an identical scale, but the criterion grade level scores were expressed on a different scale for each of the six grades. This meant that different grade levels could not be included in a factorial analysis of covariance without a transformation of either the IQ or grade level scores to allow for an accurate computation of the correlation between the covariate and criterion measures.

Such a transformation was felt to be impractical, so the achievement data, with the exception of 1st grade, was analyzed on a grade-by-grade basis with analysis of covariance. Because IQ scores were not available for the 1st grade pupils in the study, the 1st grade analysis consisted of simple analyses of variance of the scores on the Stanford Achievement Tests.

In 1st grade, the results on the six subscales of the Primary I Battery were analyzed. In 2nd and 3rd grades the results of the seven subscales in the Primary II Battery were analyzed, in 4th grade the results of the eight subscales in the Intermediate I Partial Battery were analyzed and in 5th and 6th grades the results of the seven subscales in the Intermediate II Partial Battery were compared.

Problems caused by a resignation and transfer of teachers required that some adjustments be made in the original plan for the analysis of the teacher attitudinal data. During the first year of the study, both the experimental and comparison schools lost one teacher. During the second year of the study, the experimental school lost another and the comparison school lost two more, so that at the end of the second year of the study, the experimental school had four of the six original teachers while the comparison school had only three of six. Because of this situation, it was felt best to limit the statistical analysis to that teacher attitudinal data gathered during the first year of the study. This data included pretests completed in June 1972 and first-year posttests completed in May 1973.

This first-year data were analyzed in two ways. First, an analysis of variance was performed on the experimental teachers' scores from pre- to post- to determine if there had been a change in their attitudes during the course of the year. Second, an analysis of covariance was performed to compare the attitudes of the teachers in the experimental school with those of the teachers in the comparison school.

Teacher attitudinal data gathered at the end of the second year of the study was used for basically descriptive purposes.

The classroom observation data was analyzed in two ways. First, a repeated measures analysis of variance was performed on the results for each of the schools separately in order to determine if the degree of openness of their instructional programs changed during the course of the study. Second, the means of the 14 observations for each of the individual classrooms were computed and used in an analysis of variance to determine if there was a significant difference in the degree of openness of the instructional programs of the two schools.

CHAPTER III

RESULTS

The format of this chapter is arranged so that the topics of discussion are in the same order as the questions to be addressed in the study are listed on page 3. Because of the large number of separate analyses performed, the analysis of variance and covariance source tables are not included in the text. They are shown in Appendix B.

A. Self-Concept

1. Grade 1

Table 1 shows the summary information for the May 1974 administration of the Pictorial Self-Concept Scale. As the F-ratio included in the table indicates, the analysis of variance revealed no difference between the two groups.

TABLE 1
SUMMARY DATA FOR PICTORIAL SELF-CONCEPT SGALE
GRADE 1

	Open Classroom School	Traditional School
Number of Subjects	17	24
Mean	62.52	63.22
Standard Deviation	5.80	6.36
F-Ratio	0.13	

2. Grades 2-4

TABLE 2
SUMMARY DATA FOR PICTORIAL SELF-CONCEPT SCALE
GRADES 2-4

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
2	9	58.72	9.67	64.41	6.74	63.64
3	14	63.63	4.79	65.30	10.45	65.23
4	21	67.02	5.32	61.61	12.06	62.02
			TRADITIONAL SCHOOL			
2	18	59.69	6.15	63.32	11.50	62.69
3	16	65.68	6.30	64.46	11.99	64.67
4	22	67.77	2.34	66.00	4.15	66.52

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.16
Grade (2 vs. 3 vs. 4)	0.11
Treatment x Grade	0.83

Table 2 includes the summary information for the pre- and posttest administrations of the Pictorial Self-Concept Scale and the F-ratios generated by the analysis of covariance.

As is evident, the analysis showed no significant difference between the open classroom and traditional treatment groups or among 2nd, 3rd and 4th grades, and no significant interaction between treatment and grade level.

3. Grades 5 and 6

TABLE 3
SUMMARY DATA FOR TOTAL SCORE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	54.28	11.79	61.44	12.37	62.73
6	25	58.96	10.25	61.12	8.59	59.49
			TRADITIONAL SCHOOL			
5	23	57.35	10.68	58.57	10.27	57.94
6	25	54.28	12.94	53.72	13.74	55.00

F-Test	F-Ratio
Treatment (Open vs. Traditional)	6.05*
Grade (5 vs. 6)	2.69
Treatment x Grade	0.01

*Significant beyond .05 level

Table 3 includes the summary information of the total score for the pre- and posttests administrations of the Piers-Harris Self-Concept Scale.

The results of the total score analysis show that for the treatment comparison, open classroom program vs. traditional program, there was a difference favoring the open classroom program which was statistically significant beyond the .05 level. Neither the interaction nor grade level analyses showed significant differences.

Examination of the pre- and posttest means indicate that the two traditional groups received essentially the same mean scores on the pre- and posttest administrations while the two open classroom groups, particularly the 5th grade group, showed a positive gain over the two-year period between the pre- and posttest administrations.

Tables 4 through 9 list for the six subscales of the Piers-Harris Self-Concept Scale the summary information of the pre- and posttest administrations.

TABLE 4
SUMMARY DATA FOR "BEHAVIOR" SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	13.28	2.97	15.61	2.48	16.54
6	25	15.64	2.60	15.20	2.60	15.01
			TRADITIONAL SCHOOL			
5	23	15.43	2.33	15.48	2.63	15.39
6	25	14.64	3.25	14.80	3.06	15.08

F-Test	F-Ratio
Treatment (Open vs. Traditional)	1.13
Grade (5 vs. 6)	3.22
Treatment x Grade	1.36

TABLE 5
SUMMARY DATA FOR "INTELLECTUAL AND SCHOOL STATUS"
SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	10.83	3.40	13.06	3.56	13.67
6	25	11.92	2.89	12.72	3.47	12.74
			TRADITIONAL SCHOOL			
5	23	11.09	2.98	12.35	3.27	12.82
6	25	10.84	2.98	10.04	4.23	10.65

F-Test	F-Ratio
Treatment (Open vs. Traditional)	4.44*
Grade (5 vs. 6)	4.95*
Treatment x Grade	0.79

*Significant beyond .05 level

TABLE 6

SUMMARY DATA FOR "PHYSICAL APPEARANCE AND ATTRIBUTES" SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	6.50	1.92	8.39	2.55	8.30
6	25	6.92	1.98	8.12	2.67	7.78
			TRADITIONAL SCHOOL			
5	23	6.30	2.23	7.44	2.68	7.46
6	25	5.68	2.97	5.80	3.71	6.19

F-Test	F-Ratio
Treatment (Open vs. Traditional)	4.58*
Grade (5 vs. 6)	2.54
Treatment x Grade	0.44

*Significant beyond .05 level

TABLE 7

SUMMARY DATA FOR "ANXIETY" SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	8.78	1.26	9.50	2.36	9.64
6	25	9.64	1.63	10.08	1.87	9.68
			TRADITIONAL SCHOOL			
5	23	8.91	2.07	8.87	2.36	8.93
6	25	8.60	2.00	8.48	2.55	8.73

F-Test	F-Ratio
Treatment (Open vs. Traditional)	3.77
Grade (5 vs. 6)	0.03
Treatment x Grade	0.07

TABLE 8
SUMMARY DATA FOR "POPULARITY" SUBSCALE
OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	6.72	2.56	8.11	3.56	8.47
6	25	8.32	2.46	8.44	2.06	7.92
			TRADITIONAL SCHOOL			
5	23	7.30	1.92	8.09	3.07	8.13
6	25	6.96	3.02	6.60	3.54	6.83

F-Test	F-Ratio
Treatment (Open vs. Traditional)	1.50
Grade (5 vs. 6)	2.43
Treatment x Grade	0.40

TABLE 9
SUMMARY DATA FOR "HAPPINESS AND SATISFACTION"
SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
5	18	7.11	1.02	7.06	2.10	7.24
6	25	7.48	1.01	7.88	1.27	7.76
			TRADITIONAL SCHOOL			
5	23	7.83	1.19	7.52	1.59	7.12
6	25	6.88	1.88	6.88	2.35	7.24

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.93
Grade (5 vs. 6)	0.98
Treatment x Grade	0.39

Examination of the results of the subscale analyses indicate that there was a significant treatment difference on two subscales, "Intellectual and School Status" and "Physical Appearance and Attributes," and both favored the open classroom program. Further, the grade level difference on the "Intellectual and School Status" was significant, with the grade 5 groups scoring higher than the grade 6 groups.

The responses to the two items on the May 1974 parent questionnaire concerning aspects of self-concept were essentially noncommittal, since the majority of parents used the "undecided" category. In response to the statement, "My child's self-image (how he feels about himself) has improved because of the 'open classroom' school," 51 per cent of the parents said they were "undecided," while 38 per cent said "yes" and 11 per cent said "no." In response to the statement, "Because of the 'open classroom' school, I notice that my child has more self-control now than before," 49 per cent of the parents said they were "undecided" while 27 per cent said "yes" and 24 per cent said "no."

B. Attitude Toward School

1. Faces Inventory

a. Grade 1

Table 10 presents the summary information for the May 1974 administration of the "Faces" inventory in grade 1.

TABLE 10
SUMMARY DATA FOR ANALYSIS OF "FACES" INVENTORY
GRADE 1

	Total Score		"School Learning" Subscale		"Independent Study" Subscale		"School Climate" Subscale	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	19	25	19	25	19	25	19	25
Mean	44.78	48.00	18.53	17.20	9.95	12.60	16.84	18.20
Standard Deviation	7.04	5.90	5.47	3.45	2.32	1.73	2.77	2.31
F-Ratio	2.70		0.97		18.88**		3.14	

**Significant beyond .01 level

Of the four analyses completed, only one showed a statistically significant difference. The difference, on the "Independent Study" subscale, favored the traditional program students.

b. Grade 2

Table 11 shows the summary information for the pre- and posttest administration of the "Faces" inventory and the F-ratios produced in the analysis of covariance.

TABLE 11
SUMMARY DATA FOR ANALYSIS OF "FACES" INVENTORY
GRADE 2

	Total Score		"School Learning" Subscale		"Independent Study" Subscale		"School Climate" Subscale	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	15	20	15	20	15	20	15	20
Pretest Mean	46.93	45.95	17.00	16.15	10.87	10.75	18.67	18.90
Pretest Standard Deviation	4.54	3.85	2.10	2.82	1.60	1.71	1.35	1.37
Posttest Mean	41.53	47.30	15.13	16.40	10.33	12.25	16.07	18.15
Posttest Standard Deviation	3.96	6.89	2.36	4.54	1.72	2.10	1.28	2.64
Adjusted Posttest Mean	41.50	47.33	14.96	16.53	10.31	12.27	16.11	18.12
F-Ratio	8.51**		1.51		9.02**		7.36*	

*Significant beyond .05 level
**Significant beyond .01 level

Three of the four analyses performed at this grade level resulted in significant differences favoring the traditional group. Only the "School Learning" subscale analysis showed no significant difference between the two groups.

c. Grades 3-6

Tables 12 through 15 present the summary information for the total score and three subscales of the "Faces" inventory in grades 3-6.

For none of these four analyses does the treatment comparison result in a significant difference between the open classroom program and the traditional program. There is, however, a significant grade level difference shown in three of the four analyses.

Examination of the adjusted means of the groups involved suggests that the major reason for this difference is the relatively low adjusted means of the grade 3 group in the traditional school. Further, it seems apparent that the relatively low adjusted means for this group were a result of the rather dramatic decrease in the mean score from pre- to post- of this group. For example, the mean of the total score dropped from 50.41 to 40.71 which was almost a full 10-point decline on a scale with a possible range of 60 and a standard deviation of approximately 6. While any attempt to explain this situation is speculative, the possibility of a spuriously high pretest score

TABLE 12
SUMMARY DATA FOR TOTAL SCORE OF "FACES" INVENTORY
GRADES 3-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
3	14	44.50	5.57	40.93	6.55	40.39
4	20	41.45	4.76	40.25	4.63	41.67
5	19	46.05	5.17	41.47	6.01	39.93
6	23	41.52	4.98	39.87	7.03	41.25
			TRADITIONAL SCHOOL			
3	17	50.41	6.16	40.71	7.07	36.36
4	23	41.17	5.81	40.48	3.55	42.07
5	23	43.96	5.38	41.70	5.54	41.50
6	24	42.46	3.83	42.04	6.19	42.81

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.02
Grade (3 vs. 4 vs. 5 vs. 6)	3.58*
Treatment x Grade	2.42

*Significant beyond .05 level

TABLE 13
SUMMARY DATA FOR "SCHOOL LEARNING" SUBSCALE
OF "FACES" INVENTORY
GRADES 3-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
3	14	16.71	3.56	13.93	3.15	12.32
4	20	11.90	2.29	11.85	2.76	12.89
5	19	14.74	2.96	11.68	2.77	11.16
6	23	11.74	2.24	11.61	3.14	12.74
			TRADITIONAL SCHOOL			
3	17	17.94	3.87	13.12	3.41	10.83
4	23	12.83	2.86	11.26	1.91	11.79
5	23	13.30	2.79	11.96	2.46	12.23
6	24	13.38	2.10	12.92	3.22	13.17

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.51
Grade (3 vs. 4 vs. 5 vs. 6)	2.39
Treatment x Grade	2.41

TABLE 14
SUMMARY DATA FOR "INDEPENDENT STUDY" SUBSCALE
OF "FACES" INVENTORY
GRADES 3-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
3	14	10.43	1.74	10.57	2.14	11.42
4	20	12.40	1.39	11.40	2.46	11.28
5	19	11.95	1.31	12.21	2.23	12.31
6	23	12.00	1.17	12.39	1.80	12.46
			TRADITIONAL SCHOOL			
3	17	13.35	0.93	11.47	2.15	10.88
4	23	12.17	1.27	12.91	1.81	12.90
5	23	12.39	1.31	12.61	1.83	12.49
6	24	12.04	1.12	12.75	1.98	12.81

F-Test	F-Ratio
Treatment (Open vs. Traditional)	1.51
Grade (3 vs. 4 vs. 5 vs. 6)	3.91**
Treatment x Grade	1.84

**Significant beyond .01 level

TABLE 15
SUMMARY DATA FOR "SCHOOL CLIMATE" SUBSCALE
OF "FACES" INVENTORY
GRADES 3-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
3	14	17.79	1.42	16.43	2.79	15.81
4	20	17.10	1.59	17.00	1.89	16.81
5	19	19.21	1.23	17.58	2.09	16.08
6	23	17.91	1.76	15.87	3.11	15.18
			TRADITIONAL SCHOOL			
3	17	18.88	1.50	16.12	2.71	14.83
4	23	16.04	1.97	16.30	2.01	16.77
5	23	18.00	1.62	17.13	2.42	16.38
6	24	16.96	1.57	16.38	2.65	16.28

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.06
Grade (3 vs. 4 vs. 5 vs. 6)	2.78*
Treatment x Grade	1.30

*Significant beyond .05 level

for this group is difficult to discount, especially since the actual posttest score for the group is approximately the same as the other seven groups in the analysis.

2. Days of Attendance

a. Grade 1

Table 16 shows that there was no significant difference between the days of attendance of the two grade 1 groups.

TABLE 16
SUMMARY DATA FOR DAYS OF ATTENDANCE
GRADE 1

	Open Classroom School	Traditional School
Number of Subjects	13	19
Pretest Mean	173.15	173.79
Pretest Standard Deviation	4.02	3.08
Posttest Mean	178.04	177.45
Posttest Standard Deviation	2.02	2.05
Adjusted Posttest Mean	178.06	177.43
F-Ratio	0.69	

b. Grades 2 and 3

Table 17 shows that for grades 2 and 3 there was no significant difference between the days of attendance of the open program and traditional groups, none between the grades, and no significant interaction between the treatment and grade factors.

TABLE 17
SUMMARY DATA FOR DAYS OF ATTENDANCE
GRADES 2-3

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
2	12	177.17	2.54	178.07	1.61	177.92
3	13	174.46	2.87	177.92	2.06	177.92
			TRADITIONAL SCHOOL			
2	19	172.05	7.49	177.24	2.78	177.38
3	17	175.00	4.20	177.91	2.36	177.88

F-Test	F-Ratio
Treatment (Open vs. Traditional)	0.18
Grade (2 vs. 3)	0.00
Treatment x Grade	0.18

c. Grades 4-6

Table 18 presents the summary information for the days of attendance analysis in grades 4-6.

TABLE 18
SUMMARY DATA FOR DAYS OF ATTENDANCE
GRADES 4-6

Grade	Number of Subjects	Pretest Mean	Pretest Standard Deviation	Posttest Mean	Posttest Standard Deviation	Adjusted Posttest Mean
			OPEN CLASSROOM SCHOOL			
4	21	169.64	9.58	178.17	1.67	178.83
5	18	174.81	4.62	177.56	2.33	177.17
6	23	174.76	5.97	178.24	1.81	178.24
			TRADITIONAL SCHOOL			
4	24	172.04	6.04	175.94	3.84	176.11
5	24	173.40	7.96	176.71	5.00	176.60
6	25	173.96	5.74	177.50	2.22	177.28

F-Test	F-Ratio
Treatment (Open vs. Traditional)	6.61*
Grade (4 vs. 5 vs. 6)	0.57
Treatment x Grade	1.97

*Significant beyond .05 level

The analysis of covariance indicates that there was a significant difference between the two groups in their days of school attendance. This difference, significant beyond the .05 level, favored the open classroom program.

3. Parent and Pupil Questionnaires
   a. First-Year Results

Tables 19 and 20 give responses to selected questions from a parent questionnaire and a pupil questionnaire designed by district personnel and administered during January 1973 to the parents and pupils of the open classroom school. (Only those items which address a general feeling or attitude toward school are included in these tables; the complete questionnaires are shown in Appendix D.)

TABLE 19
RESPONSES TO SELECTED ITEMS FROM
SPORTING HILL PARENT QUESTIONNAIRE*

Did your child ever comment that he did not want to attend school before this year?
Yes 37.6 per cent No 62.4 per cent

Did your child ever comment that he did not want to attend school this school year?
Yes 16.1 per cent No 83.9 per cent

My child seems to like this school and enjoys the program.
Yes 96.6 per cent No 9.0 per cent
No Response 2.4 per cent

*Tabulation based upon 122 returned questionnaires.

TABLE 20
RESPONSES TO SELECTED ITEMS FROM
SPORTING HILL PUPIL QUESTIONNAIRE*

How do you compare Sporting Hill School this year to last year's school?

88 per cent	a.	This year is more interesting
3 per cent	b.	This year is less interesting
8 per cent	c.	It is the same
_____	d.	No response

How often did you feel as though you didn't want to come to school last year?

26 per cent	a.	Never	13 per cent	d.	Always
41 per cent	b.	Sometimes	1 per cent	e.	No response
19 per cent	c.	Often			

How often did you feel as though you didn't want to come to school this year?

70 per cent	a.	Never	5 per cent	c.	Often
20 per cent	b.	Sometimes	5 per cent	d.	Always

*The tabulation of responses was based upon completed questionnaires from 133 pupils in grades 1 through 6.

The tabulation of the items in the two tables indicate that 88 per cent of the pupils in the open classroom school find the school more interesting than their school of the previous year. The responses of the parents reinforce this, as 96.6 per cent of the parents indicate that their children like the school and enjoy the program.

Further, both the parent and pupil responses to the items concerning desire to attend school indicate that the children's feelings toward attending school improved after the introduction of the open classroom program in their school.

The percentage of parents who said their children did not want to attend school declined from 37.6 per cent for past years to 16.1 per cent in the first year of the program, a drop of 21.5 per cent.

The pupil responses indicate this change in feeling even more strongly. The percentage of children who indicated they never felt like not attending school increased from 27 per cent to 70 per cent. The percentage of children who often or always felt that they did not want to attend school decreased from 32 per cent to 10 per cent.

b. Second-Year Results

Table 21 shows the responses of parents of pupils in the open classroom school to selected items of a questionnaire administered near the end of the 1973-74 school year. (The complete questionnaire is shown in Appendix D.)

TABLE 21
RESPONSES TO 1974 PARENT QUESTIONNAIRE*

I'm glad that my child is attending the "open classroom" school.
Yes 66 per cent Undecided 24 per cent No 10 per cent

I feel that my child is getting more attention in school now.
Yes 69 per cent Undecided 21 per cent No 10 per cent

My child seems to like school more now.
Yes 75 per cent Undecided 15 per cent No 10 per cent

My child says more positive and nice things about school and his teachers than before.
Yes 59 per cent Undecided 27 per cent No 14 per cent

My child seems more enthusiastic about school and learning now.
Yes 77 per cent Undecided 12 per cent No 11 per cent

*Seventy per cent (67 of 96) of the families with a child or children at Sporting Hill returned a questionnaire.

These responses indicate that the parents of the children in the open classroom school believe that their children perceive school in a more positive way than they did prior to the inception of the open program. Seventy-five per cent of the parents said that their children "like school more now," 59 per cent indicated that their child "says more positive and nice things about school and his teacher than before," and 77 per cent believed that their child "seems more enthusiastic about school and learning..." Sixty-six per cent of the parents were "glad" that their child was attending the open school and about the same number, 69 per cent, felt that their child was receiving more attention in the open school than had been the case prior to the inception of the open program.

It is interesting to note that relatively few parents were definitely negative in their responses to the items concerning the open classroom program. For example, only 10 per cent of the parents indicated that they were not pleased by the fact that their child was attending the open classroom school. About the same percentage of parents were definitely negative in their responses to the other items presented in the table.

C. Academic Achievement

Tables 22 through 27 summarize the results of the administration and covariance analysis of the various subscales of the Stanford Achievement Test in grades 1 through 6.

Of the 44 separate analyses performed, only six produced statistically significant differences. Of these six, three favored the open classroom group and three favored the traditional group. The open classroom group scored significantly better than the traditional group on the Science and Social Studies Concepts subscale in grade 3, the Word Meaning subscale in grade 6, and on the Arithmetic Applications subscale in grade 6. The traditional group scored significantly better than the open school group on the Arithmetic Computation and the Arithmetic Application subscale in grade 4 and significantly better on the Language subscale in grade 5.

TABLE 22

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 1

	SUBSCALE											
	WORD READING		PARAGRAPH MEANING		VOCABULARY		SPELLING		WORD STUDY SKILLS		ARITHMETIC	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	19	25	19	25	19	25	19	25	19	25	19	25
Mean Grade Level Score	2.12	2.46	1.85	2.11	2.53	2.34	2.12	2.52	2.64	3.54	2.36	2.62
Standard Deviation	.71	.51	0.86	0.45	0.70	0.56	0.88	0.66	1.64	1.49	0.60	0.74
F-Ratio	3.36		1.69		0.92		2.98		3.63		1.56	

TABLE 23

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 2

	SUBSCALE															
	WORD MEANING		PARAGRAPH MEANING		SCIENCE AND SOCIAL STUDIES CONCEPTS		SPELLING		WORD STUDY SKILLS		LANGUAGE		ARITHMETIC COMPUTATION		ARITHMETIC CONCEPTS	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	15	25	15	25	15	25	15	25	15	25	15	25	15	25	15	25
Covariate (IQ) Mean	109.60	103.72	109.60	103.72	109.60	103.72	109.60	103.72	109.60	103.72	109.60	103.72	109.60	103.72	109.60	103.72
Mean Grade Level Score	3.32	2.82	3.06	2.73	3.37	3.10	3.12	2.93	3.95	3.78	3.21	3.35	2.65	2.28	3.21	2.73
Adjusted Mean	3.36	3.95	3.07	3.44	2.58	2.32	3.05	2.82	3.11	2.95	2.86	2.85	3.21	3.20	2.95	3.03
F-Ratio	0.53		0.00		0.00		0.09		0.51		2.42		2.04		0.91	

TABLE 24

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 3

	SUBSCALE															
	WORD MEANING		PARAGRAPH MEANING		SCIENCE AND SOCIAL STUDIES CONCEPTS		SPELLING		WORD STUDY SKILLS		LANGUAGE		ARITHMETIC COMPUTATION		ARITHMETIC CONCEPTS	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	16	19	16	19	16	19	16	19	16	19	16	19	16	19	16	19
Covariate (IQ) Mean	100.81	113.00	100.81	113.00	100.81	113.00	100.81	113.00	100.81	113.00	100.81	113.00	100.81	113.00	100.81	113.00
Adjusted Mean	3.37	3.50	3.92	3.55	4.37	3.54	3.86	3.62	5.10	4.34	3.56	3.14	3.37	3.35	4.69	4.18
F-Ratio	0.16		0.97		6.90*		0.29		2.15		2.22		0.00		1.91	

*Significant beyond .05 level

TABLE 25

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 4

	SUBSCALE															
	WORD MEANING		PARAGRAPH MEANING		SPELLING		WORD STUDY SKILLS		LANGUAGE		ARITHMETIC COMPUTATION		ARITHMETIC CONCEPTS		ARITHMETIC APPLICATIONS	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	25	26	25	26	25	26	25	26	25	26	25	26	25	26	25	26
Covariate (IQ) Mean	107.08	110.65	107.08	110.65	107.08	110.65	107.08	110.65	107.08	110.65	107.08	110.65	107.08	110.65	107.08	110.65
Mean Grade Level Score	4.83	4.95	4.00	5.02	4.66	5.26	4.46	5.38	3.99	4.67	3.30	4.17	4.32	5.01	3.92	4.95
Adjusted Mean	4.94	4.85	4.12	4.91	4.77	5.15	4.62	5.22	4.14	4.53	3.34	4.13	4.43	4.90	4.01	4.86
F-Ratio	0.05		3.85		0.63		1.85		1.18		13.59**		1.97		9.40**	

**Significant beyond .01 level

TABLE 26

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 5

	SUBSCALE													
	WORD MEANING		PARAGRAPH MEANING		SPELLING		LANGUAGE		ARITHMETIC COMPUTATION		ARITHMETIC CONCEPTS		ARITHMETIC APPLICATIONS	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Number of Subjects	22	30	22	30	22	30	22	30	22	30	22	30	22	30
Covariate (IQ) Mean	101.82	105.97	101.82	105.97	101.82	105.97	101.82	105.97	101.82	105.97	101.82	105.97	101.82	105.97
Mean Grade Level Score	5.72	6.21	5.35	5.59	5.26	6.71	4.60	5.64	4.53	4.87	5.30	5.72	5.20	5.64
Adjusted Mean	5.95	6.05	5.57	5.43	5.48	6.00	4.83	5.48	4.61	4.81	5.41	5.62	5.34	5.53
F-Ratio	0.14		0.30		2.05		5.62*		0.66		0.86		0.58	

*Significant beyond .05 level

TABLE 27

SUMMARY DATA FOR STANFORD ACHIEVEMENT TEST
GRADE 6

	SUBSCALE													
	WORD MEANING		PARAGRAPH MEANING		SPELLING		LANGUAGE		ARITHMETIC COMPUTATION		ARITHMETIC CONCEPTS		ARITHMETIC APPLICATIONS	
	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School	Open Classroom School	Traditional School
Numoer of Subjects	27	29	27	29	27	29	27	29	27	29	27	29	27	29
Covariate (IQ) Mean	104.11	101.83	104.11	101.83	104.11	101.83	104.11	101.83	104.11	101.83	104.11	101.83	104.11	101.83
Mean Grade Level Score	6.64	5.66	6.01	5.98	6.79	6.20	6.11	5.34	5.67	5.71	6.34	6.19	7.12	5.84
Adjusted Mean	6.52	5.77	5.90	6.07	6.62	6.35	5.46	5.98	5.60	5.77	6.26	6.27	7.02	5.93
F-Ratio	5.55*		0.35		0.39		3.31		0.32		0.00		8.52**	

*Significant beyond .05 level
**Significant beyond .01 level

D. Teacher Attitudes

Tables 28 and 29 summarize the analyses performed using the data from the 1972 pretest scores and the 1973 posttest scores on the "Opinionnaire on Attitudes Toward Education." (As indicated previously, because of the loss of subjects this segment of the analysis was limited to first-year data.)

TABLE 28
EXPERIMENTAL TEACHER ATTITUDES*

	Number of Subjects	Mean Score	Standard Deviation	F-Ratio
Pretest	5	206	10.86	1.29
Posttest	5	212	4.64	

*One of the six teachers in the experimental school left during the 1972-73 school year. Therefore, only the scores of the five remaining teachers were included in this analysis.

TABLE 29
SUMMARY DATA FOR COMPARISON OF
RESULTS OF TEACHER ATTITUDE ANALYSIS*

	Open Classroom Teachers	Traditional Teachers
Number of subjects	5	5
Pretest Mean	206.00	203.6
Pretest Standard Deviation	10.86	8.93
Posttest Mean	212.00	208.6
Posttest Standard Deviation	4.64	6.91
Adjusted Posttest Mean	211.83	208.77
F-Ratio	0.62	

*Both the open classroom and traditional schools had a teacher resign during the 1972-73 school year. Thus, this comparison was made using the scores of the five remaining teachers in each school.

As Table 28 shows, there was no statistically significant difference between the mean pretest score and the mean 1973 posttest score of the experimental teachers. Further, a t-test (t = .69) comparing the 1972 pretest mean and the 1974 posttest mean of the four experimental teachers involved in both years of the study showed this difference to be nonsignificant.

Table 29 summarizes the results of the covariance comparing the attitude scores of the open classroom teachers and the traditional teachers in the study. Again, there was no significant difference between the two groups.

E. Classroom Observations

Table 30 presents the mean observation scores for the series of the 14 observations conducted in each of the classrooms in the two schools during the course of the study. The accompanying graph is a visual representation of the same data.

GRAPH OF CLASSROOM OBSERVATION DATA

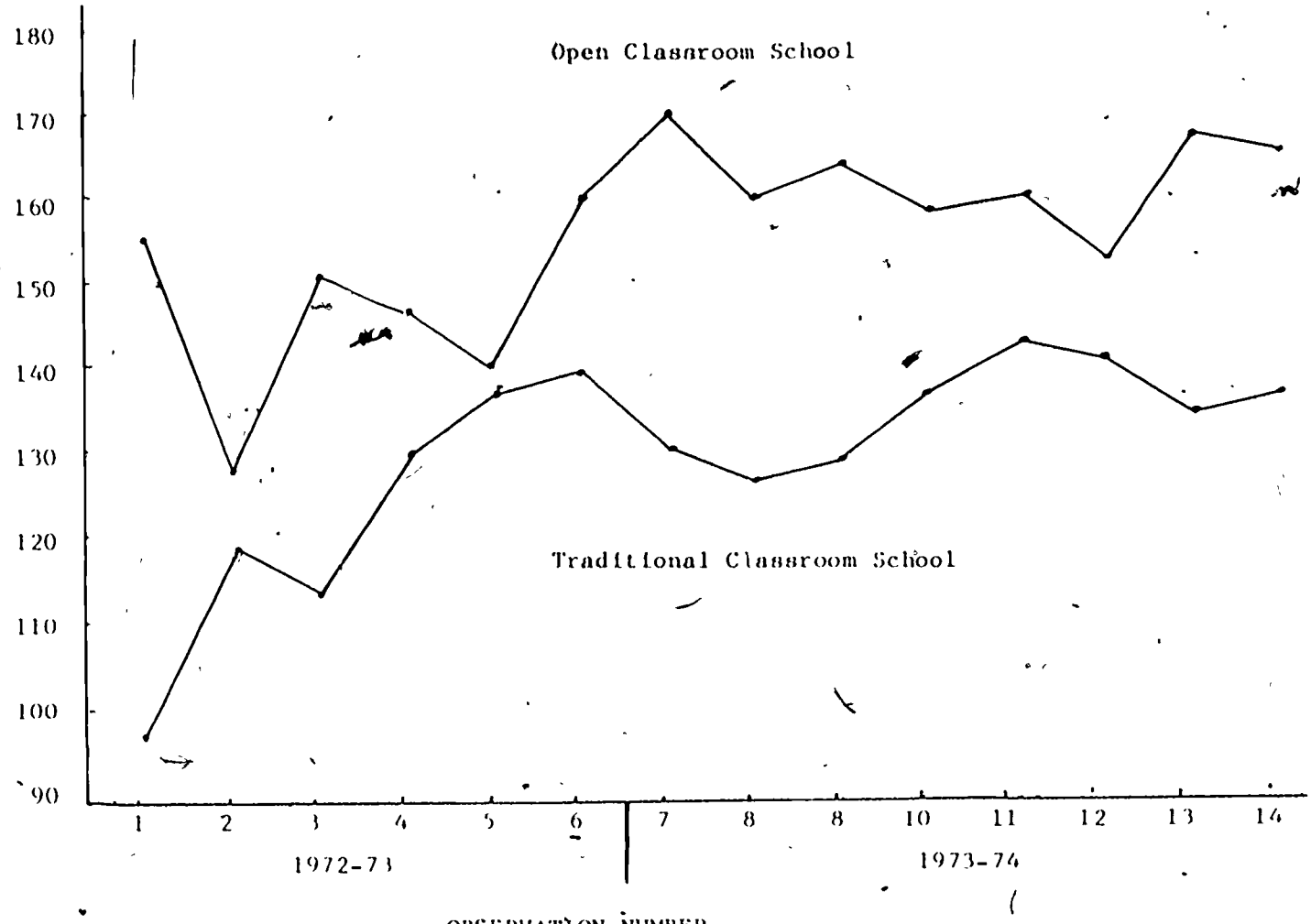

TABLE 30
SUMMARY OF CLASSROOM OBSERVATION DATA

Observation Number	Traditional School	Open Classroom School
1	98	157
2	120	128
3	116	154
4	131	148
5	140	141
6	142	162
7	132	171
8	128	161
9	130	165
10	139	160
11	145	162
12	142	149
13	136	169
14	138	167
Overall Mean	131	157
F-Ratio for Repeated Measures ANOVA	8.93**	30.63**

**Significant beyond .01 level

As is evident, both instructional programs experienced changes in their degree of openness during the course of the study. The repeated measures analyses of variance performed on the observational data (F-ratios are shown in Table 30) show that these changes were statistically significant in both schools.

The series of means and the graph indicate that the instructional programs in both schools became more open over the course of the study, with much of this change occurring during the first year of the study. The observations for the second year indicate that both programs were relatively stable in their degree of openness during the second year.

William Donny, who performed the series of observations in both schools, describes them in the following way:

> Observations of the experimental and control schools throughout the study indicated that the schools varied from observation to observation in their degree of methodological openness of conventionality.
>
> The experimental school chose to launch its new program during the first days of school with enthusiastic efforts to operate successfully the rather free, fluid, individualized open processes. Added to the pressures of this ambitious beginning was the constant flow of visitors that were hosted, and the considerable number of after school work hours needed to sustain this new demanding multiprocess educational method. During intervals when new learning stations and procedures were being installed, the open school faculty reverted at times to simpler large group conventional methods and were rated accordingly. Large variations in degree of openness occurred from period to period

during the first year although an overall increase did occur.

Perhaps due to publicity released about the experimental school as well as the physical proximity of the two, the control school increasingly adopted techniques of openness during most of the first year, but within the framework of their established practices. The result was a fairly consistent trend to greater openness with time but leveling off toward the end of the first year. The differences between the two groups would have been greater if the conventional school had not changed markedly in degree of openness contrary to what is expected of a true control.

As a result of these trends the position of the two schools became at times very similar with regard to openness as measured by the observation instrument. However, near the end of the first year, while the control school turned back to a more conventional educational process, the experimental school appeared to have found the degree of openness suited to its needs and began to operate the new program with confidence and aplomb. Observations carried out in the succeeding year tended to clarify further this situation. These observations indicated that the open school retained its status with regard to degree of openness, while the conventional school maintained a relatively more conventional methodological position.

The above described movement of the comparison school toward openness and the fluctuation in the degree of openness of the experimental school mean that, not surprisingly, the ideal comparison between strictly and continually delineated "traditional" and "open" instructional programs was not possible. It suggests that the absence of any consistent difference between the students of the two schools might be at least partially explained as resulting from the fact that the two instructional programs were not really very different. However, although the difference between the two programs was not as great as might have been desired, that difference was significant.

An anlysis of variance comparing the two schools on the basis of the means of the 14 observations for individual classrooms produced an F-ratio of 63.43 which is significant beyond the .01 level. (ANOVA source table is shown in Appendix B.) So, even though the varying differences between the two instructional programs might have diluted any differential effect which instruction program "openness" might have exerted upon students, the fact remains that the two programs were rated as being significantly different on the instrument which quantified this variable. Because of this, it does not seem probable that the absence of student differences between the two schools can be totally attributed to program similarity.

CHAPTER IV

DISCUSSION, SUMMARY, AND RECOMMENDATIONS

As stated in Chapter I, the purpose of this study was to gather evidence related to five basic questions. The first section of this chapter restates these questions and briefly discusses the findings and conclusions which relate to them. The second section of the chapter is a general summary of the study and the third section presents recommendations for future research.

Discussion of Findings

Question 1: Is there a significant difference between the self-concept of children involved in an open classroom instructional program and those involved in a traditional program?

The results of the self-concept segment of the study are somewhat mixed. The analyses of the Pictorial Self-Concept Scale for grades 1-4 indicate no real differences between the scores of the students of the two programs.

The analyses of the Piers-Harris Children's Self-Concept Scale for grades 5 and 6, on the other hand, resulted in significant differences favoring the open classroom students on total score and on the "Intellectual and School Status" and "Physical Appearance and Attributes" subscales. Thus, there is some evidence to suggest that, at least for the students in the intermediate grades, involvement in the open classroom program resulted in a positive change in self-concept.

An alternative explanation for this difference favoring the open classroom students which must be considered is that it was the result of teacher differences. Since there was only one teacher per grade for each treatment, it is not possible to totally eliminate this alternative explanation. However, the fact that the study was conducted over a two-year period weakens somewhat the argument for this explanation of the difference, since the students involved were exposed to more than one teacher during the study. Further, an examination of the pre- and posttest means of the groups in the three analyses which resulted in significant differences favoring the open classroom program shows that while the two traditional groups and the two open classroom groups scored at about the same level on the pretest administration, the traditional groups remained at the same level while the open classroom groups showed a positive gain over the two years.

Thus, it appears reasonable to tentatively conclude that the open classroom treatment exercised a positive, differential effect upon the grade 5 and 6 students in the area of self-concept.

Question 2: Is there a significant difference between the attitudes toward school of children involved in an open classroom instructional program and those involved in a traditional program?

The evidence relating to this question is also somewhat mixed. The analyses performed with the "Faces" inventory data show that in grade 1, the traditional students scored significantly higher on the "Independent Study" subscale than the open classroom students, that in grade 2 the traditional students scored significantly higher on the total score and on the "Independent Study" and "School Climate" subscales than the open classroom students, but that in the other analyses for these grades and in all the analyses for grades 3-6 there were no significant treatment differences favoring either the open classroom or the traditional students.

The days of attendance analyses for grade 1 and grades 2-3 showed no significant difference between the two programs. However, the analysis for grades 4-6 resulted in a significant difference favoring the open classroom treatment.

The data collected with the pupil and parent questionnaires at the open classroom school indicates an improvement in attitude toward school after the implementation of the open classroom program. A large majority (88 per cent) of the students felt that the open program was more interesting than the previous one and a large number of students (42 per cent) indicated a positive change in their desire to attend school. The responses of parents on their questionnaires reinforced these student responses.

Overall, then, the results of the attitude toward school segment of the students do not provide a clear-cut answer to question number two. However, there does appear to be sufficient evidence to suggest that the open classroom program positively influenced the attitudes toward school of the children involved.

Question 3: Is there a significant difference between the level of achievement in basic skills of children involved in an open classroom instructional program and those involved in a traditional instructional program?

The data collected with the Stanford Achievement Tests indicates rather clearly that there was no difference between the two instructional programs in relation to their effect upon student achievement of basic skills. Only six of the 44 separate analyses performed resulted in statistically significant differences. Of these six, three favored the traditional group and three favored the open classroom group. So, it appears that the answer to the basic skills question is "no."

Question 4: Does teaching in an open classroom cause a change in teacher attitudes toward child-centered policies and practices in education?

The results of the analysis of the teacher attitude opinionnaire indicate that no significant change in the attitudes of the open classroom teachers occurred during the course of the study. This finding is encouraging, since it indicates that actual, prolonged experience with open classroom procedures did not change the positive attitudes the teachers held toward the value of policies and practices which are basic components of the open education philosophy.

Question 5: What are the extent of the changes in classroom environment and practices which result from continued experience with the open classroom?

Analysis of the classroom observation data indicates that there were statistically significant changes in the classroom environment and practices during the course of the study, particularly during the first year. The observation rating scale results, teachers' comments, and observer's reactions indicate that, as would be expected during the first year of a rather significant changeover, there were fluctuations in practices as the open classroom teachers searched for the most appropriate and successful mode of operation. The second-year observation data indicate that a relatively stable mode of operation was arrived at and maintained. Overall, the degree of openness increased from the beginning of the study to the end, indicating an apparent satisfaction with the success of the open classroom program.

Summary

Because of the relatively limited scope of the study and the lack of any observable strong differential effects, the results of the study do not provide any

conclusive or readily generalizable information about the relative effectiveness of open classroom or traditional instructional programs. Nevertheless, the results are encouraging from several standpoints.

First of all, there are indications that in the affective areas of self-concept and attitude toward school the open classroom program did exert a positive effect upon the students involved. This finding lends tentative support to the claims of the proponents of open education who believe that their mode of instruction will have its more significant effects in this area.

Also, the level of achievement of basic skills by the students in the open program was essentially the same as that of those in the traditional program. Since there generally is more overt emphasis placed upon such attainment in traditional instructional programs than in open programs, this finding is revealing.

Finally, the observation and questionnaire data indicate that the open program is now running smoothly, that it is well accepted by students and parents and that the teachers have retained their initial enthusiasm for the program after continued experience with it. This is encouraging since it indicates that the program has probably passed through the "bandwagon" phase, beyond which so many innovative programs have not proceeded.

Overall then, it appears that the study described herein, while not providing conclusive evidence concerning the relative effectiveness of the open or traditional instructional programs, indicates that the open classroom program was successfully implemented and achieved some positive results.

Recommendations for Future Research

The experience gained in this study indicates that there are three primary needs which can be met by future research and evaluation in the area of open classroom education.

1. There is a need for longitudinal studies in which the long-term effects of exposure to open classroom education programs can be assessed. The pupil characteristics which open education proponents hope to affect do not appear to be ones which can be significantly altered over a short period of time. Such attributes as self-concept, attitude toward learning and level of cognitive functioning theoretically are formed over a period of years and to expect a change in such fundamental characteristics in one or two years is probably unrealistic. Studies which measure these variables over several years should provide a more sound evaluation of open education than the typical one- or two-year study.

2. There is also a strong need for more wide-ranging, large-scale evaluations of the effects of open education. The flexibility inherent in open education instructional programs makes generalizing of results from a specific classroom or school a very tenuous venture. However, while it is understandable that open programs will differ from one locale to another, it does not appear unreasonable to expect that fundamental common components will be present in almost all open programs. Results of studies which include several schools with varied open programs would appear to be more generalizable, since the components common to open programs would be more reasonable causes of results than the host

of specific characteristics which might affect the results of one program.

3. There is a need for evaluation which focuses on variables which are not normally assessed in program comparison studies. The proponents of open education believe that the major impact of their programs will be reflected in changes in such areas as children's creativity, motivation, self-direction, social awareness, and higher-order cognitive learning. However, for reasons such as nonexistence of instruments and constraints upon time and money, these variables are often not included in major program comparison studies. If open classroom education is to be thoroughly evaluated, studies incorporating these variables will be necessary.

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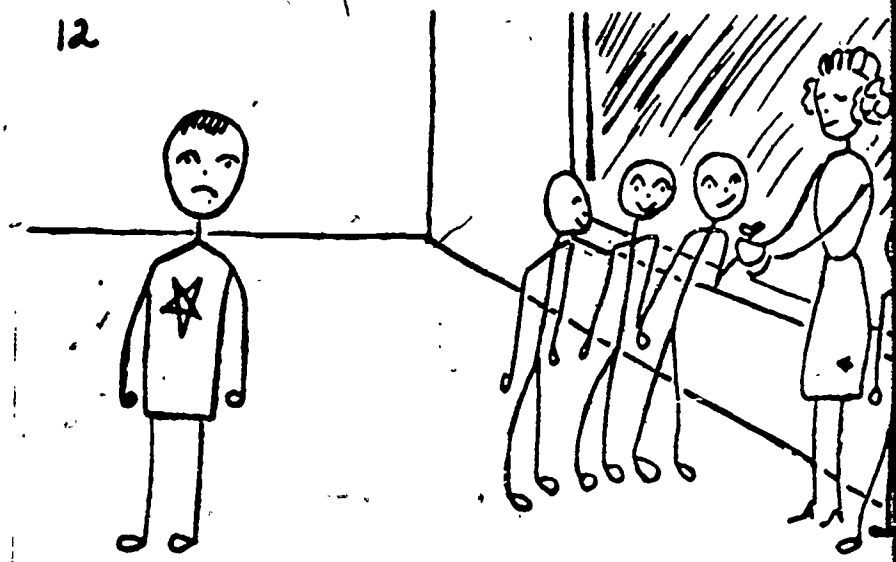
APPENDICES

APPENDIX A-1

Sample Items from Pictorial Self-Concept Scale

2.

12



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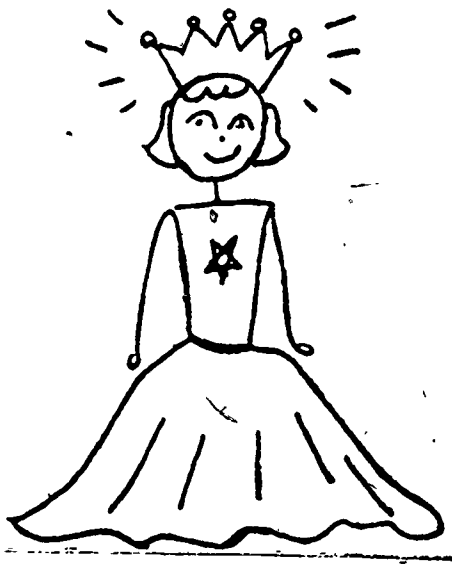

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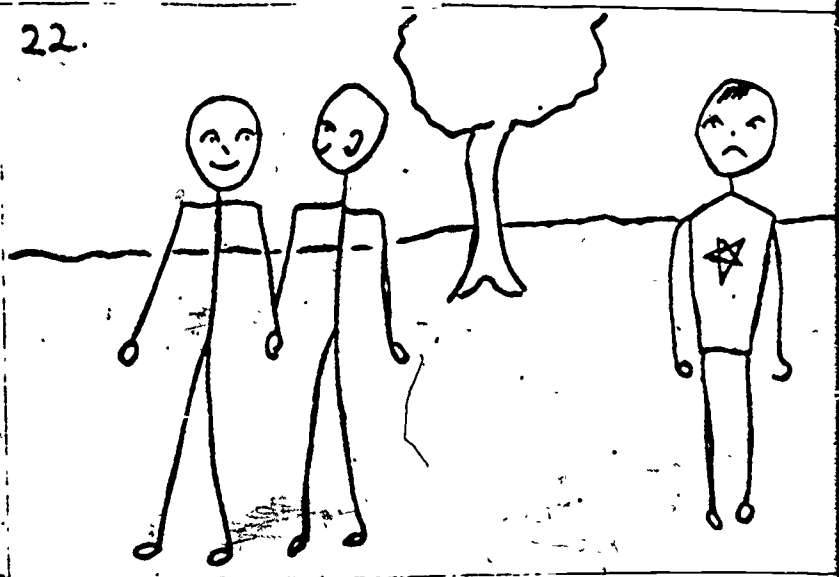

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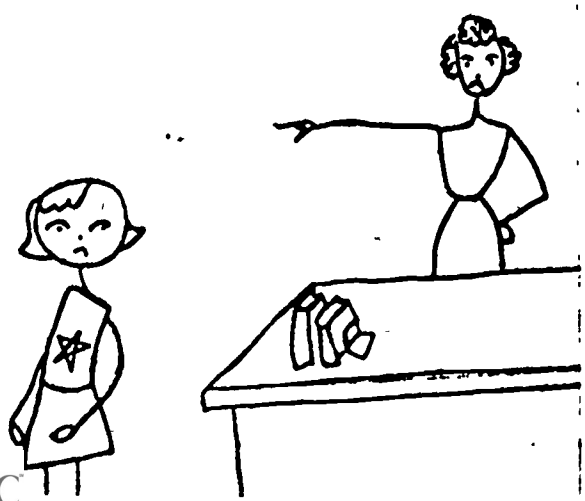

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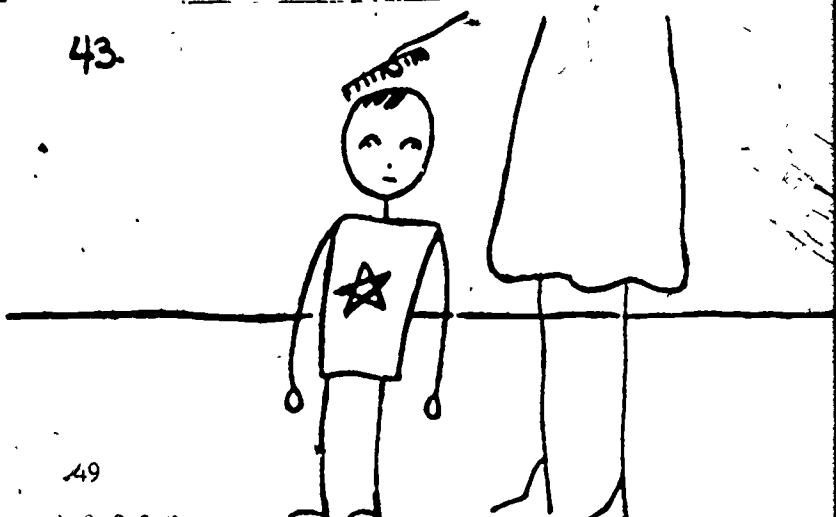

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APPENDIX A-2

The Piers-Harris Children's Self-Concept Scale

Here are a set of statements. Some of them are true of you and so you will circle the yes. Some are not true of you and so you will circle the no. Answer every question even if some are hard to decide, but do not circle both yes and no. Remember, circle the yes if the statement is generally like you, or circle the no if the statement is generally not like you. There are no right or wrong answers. Only you can tell us how you feel about yourself, so we hope you will mark the way you really feel inside.

1. My classmates make fun of me . . . . . yes no
2. I am a happy person . . . . . yes no
3. It is hard for me to make friends . . . . . yes no
4. I am often sad . . . . . yes no
5. I am smart . . . . . yes no
6. I am shy . . . . . yes no
7. I get nervous when the teacher calls on me . . . . . yes no
8. My looks bother me . . . . . yes no
9. When I grow up, I will be an important person . . . . . yes no
10. I get worried when we have tests in school . . . . . yes no
11. I am unpopular . . . . . yes no
12. I am well behaved in school . . . . . yes no
13. It is usually my fault when something goes wrong . . . . . yes no
14. I cause trouble to my family . . . . . yes no
15. I am strong . . . . . yes no
16. I have good ideas . . . . . yes no
17. I am an important member of my family . . . . . yes no
18. I usually want my own way . . . . . yes no
19. I am good at making things with my hands . . . . . yes no
20. I give up easily . . . . . yes no
21. I am good in my school work . . . . . yes no
22. I do many bad things . . . . . yes no
23. I can draw well . . . . . yes no
24. I am good in music . . . . . yes no
25. I behave badly at home . . . . . yes no
26. I am slow in finishing my school work . . . . . yes no
27. I am an important member of my class . . . . . yes no
28. I am nervous . . . . . yes no
29. I have pretty eyes . . . . . yes no
30. I can give a good report in front of the class . . . . . yes no
31. In school I am a dreamer . . . . . yes no
32. I pick on my brother(s) and sister(s) . . . . . yes no
33. My friends like my ideas . . . . . yes no
34. I often get into trouble . . . . . yes no
35. I am obedient at home . . . . . yes no
36. I am lucky . . . . . yes no
37. I worry a lot . . . . . yes no
38. My parents expect too much of me . . . . . yes no
39. I like being the way I am . . . . . yes no
40. I feel left out of things . . . . . yes no

41. I have nice hair . . . . . yes no
42. I often volunteer in school . . . . . yes no
43. I wish I were different . . . . . yes no
44. I sleep well at night . . . . . yes no
45. I hate school . . . . . yes no
46. I am among the last to be chosen for games . . . . . yes no
47. I am sick a lot . . . . . yes no
48. I am often mean to other people . . . . . yes no
49. My classmates in school think I have good ideas . . . . . yes no
50. I am unhappy . . . . . yes no
51. I have many friends . . . . . yes no
52. I am cheerful . . . . . yes no
53. I am dumb about most things . . . . . yes no
54. I am good looking . . . . . yes no
55. I have lots of pep . . . . . yes no
56. I get into a lot of fights . . . . . yes no
57. I am popular with boys . . . . . yes no
58. People pick on me . . . . . yes no
59. My family is disappointed in me . . . . . yes no
60. I have a pleasant face . . . . . yes no
61. When I try to make something, everything seems to go wrong . yes no
62. I am picked on at home . . . . . yes no
63. I am a leader in games and sports . . . . . yes no
64. I am clumsy . . . . . yes no
65. In games and sports, I watch instead of play . . . . . yes no
66. I forget what I learn . . . . . yes no
67. I am easy to get along with . . . . . yes no
68. I lose my temper easily . . . . . yes no
69. I am popular with girls . . . . . yes no
70. I am a good reader . . . . . yes no
71. I would rather work alone than with a group . . . . . yes no
72. I like my brother (sister) . . . . . yes no
73. I have a good figure . . . . . yes no
74. I am often afraid . . . . . yes no
75. I am always dropping or breaking things . . . . . yes no
76. I can be trusted . . . . . yes no
77. I am different from other people . . . . . yes no
78. I think bad thoughts . . . . . yes no
79. I cry easily . . . . . yes no
80. I am a good person . . . . . yes no

APPENDIX A-3

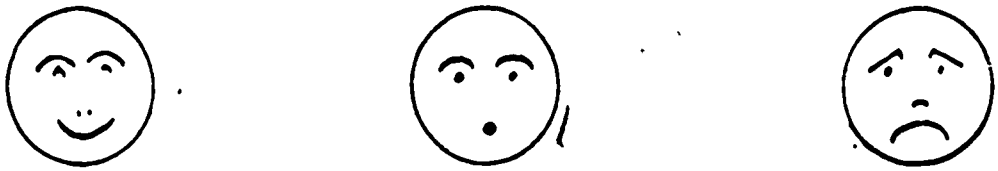
"FACES" Inventory

Age _____ Name _____

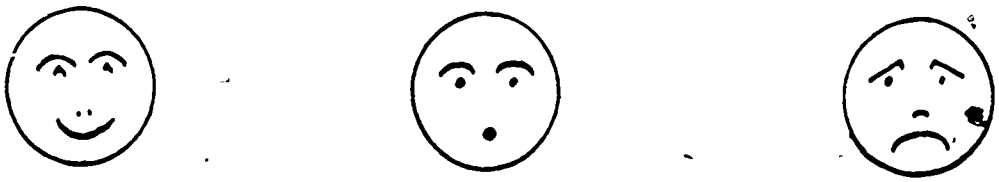
Grade _____ School _____

ID Code _____ Date _____

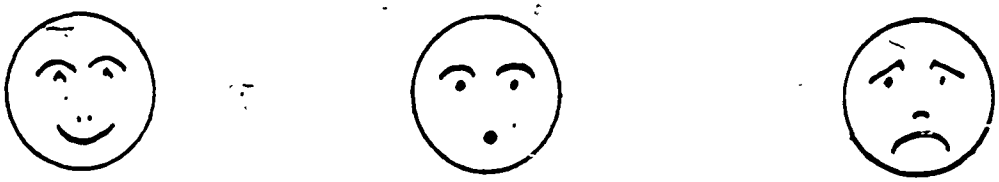
1. This is how I feel when I come to school.



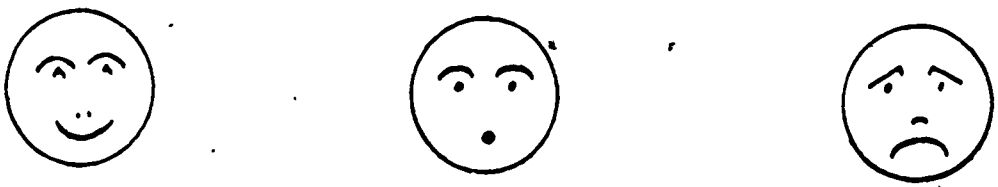
2. I feel like this when the teacher tells me to do something all by myself without any help.



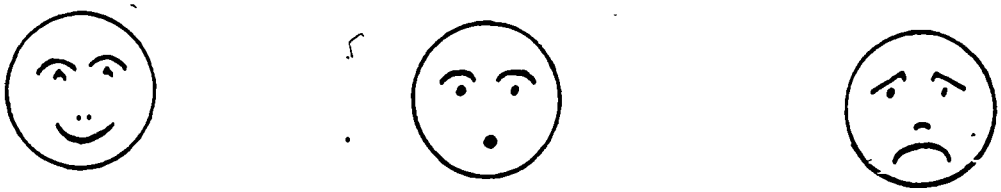
3. This is how I would feel if I could go to school for the rest of my life.



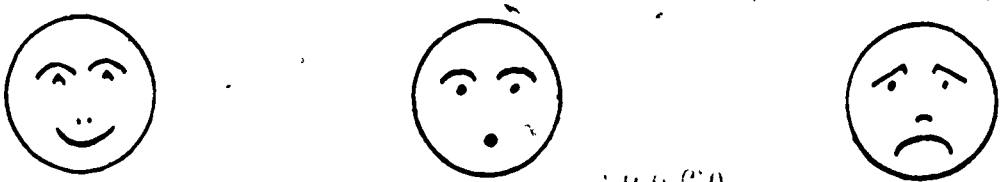
4. I feel like this when someone does not follow the rules.



5. I feel like this when I work alone.

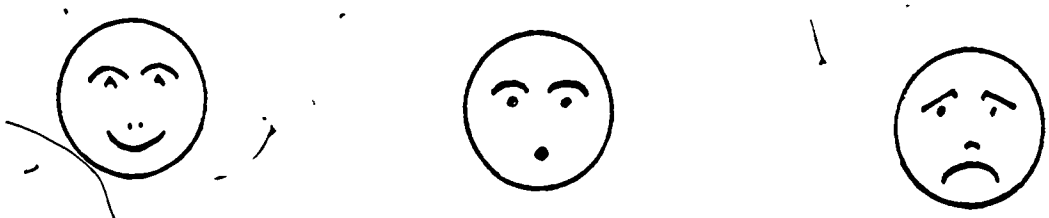


6. I feel like this when I have a lot of school work to do.

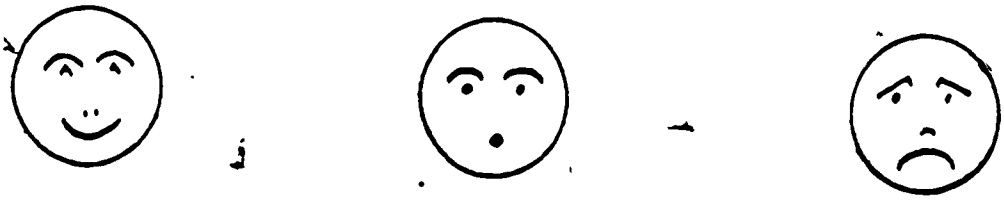


7. I feel like this about going to summer school.

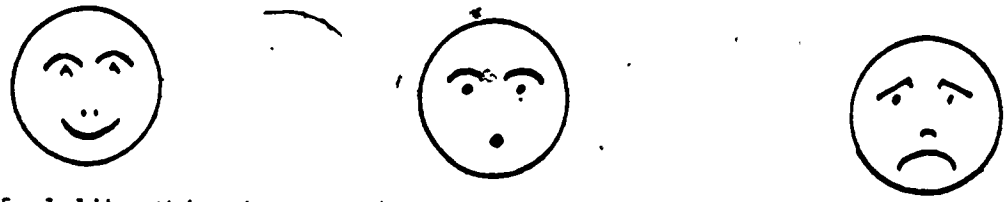
8. I feel like this when I work on a project by myself.



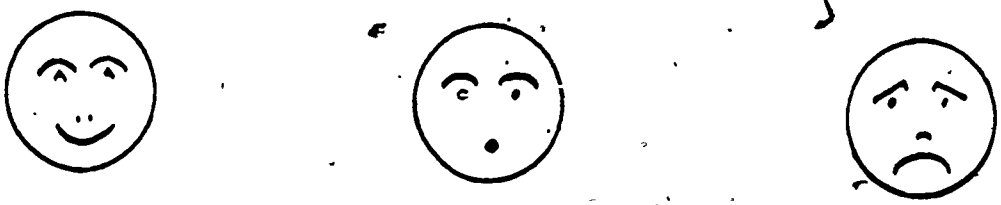
9. This is how I feel about going back to school after a vacation.



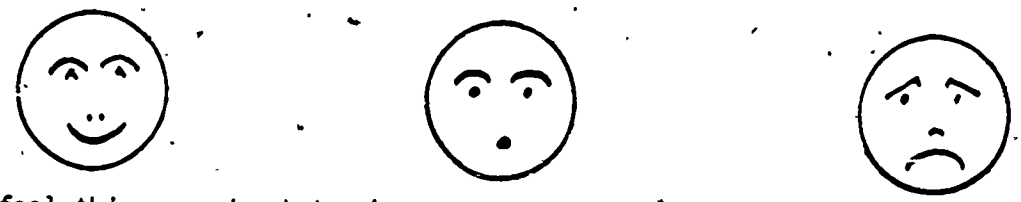
10. This is how I feel when I talk to my teachers.



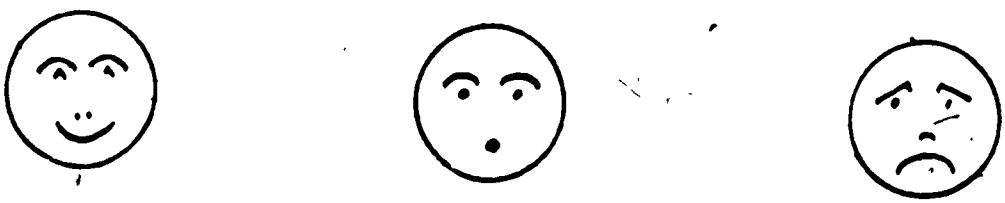
11. I feel like this about studying alone.



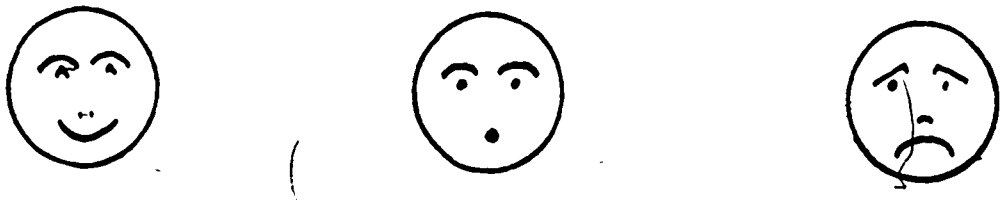
12. This is how I feel on days when I can't go to school.



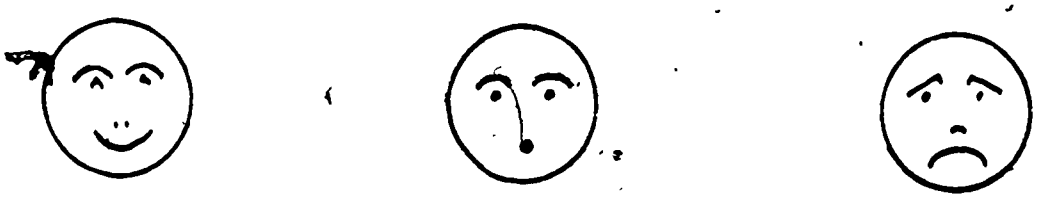
13. I feel this way about teachers.



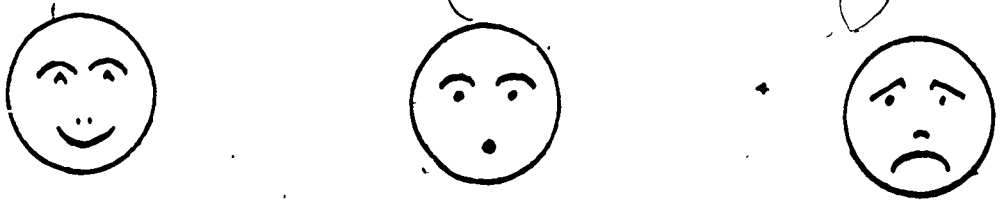
14. I feel this way about reading a book by myself.



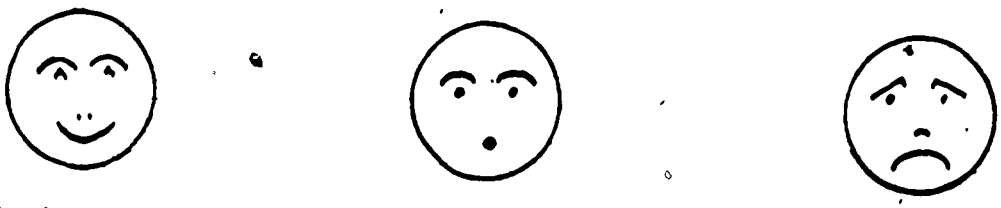
15. This is how I would feel if we could have school on Saturday, too.



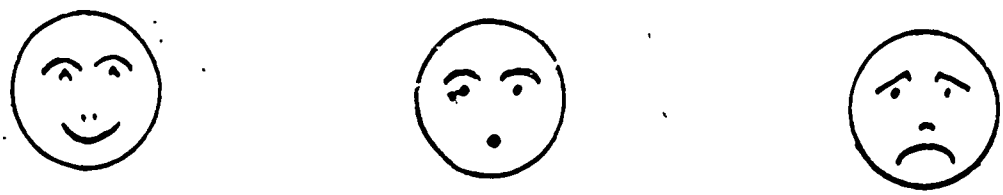
16. This is how I feel about school rules.



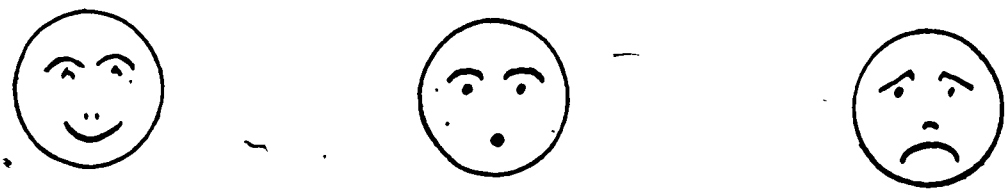
17. I feel this way when the teacher asks me questions.



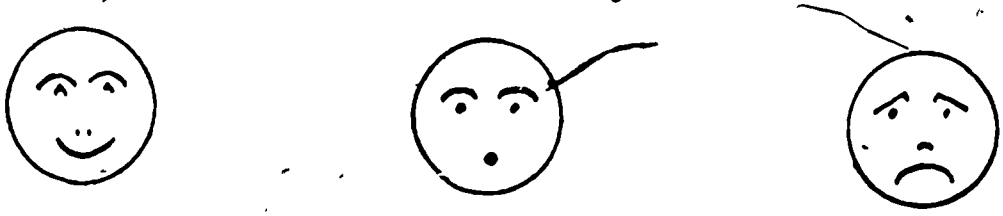
18. This is how I feel when it's time to go home from school.



19. I feel like this when I go to the media center (library).



20. This is how I feel about my school building.



Name_____ School_____

Date_____

OPINIONNAIRE ON ATTITUDES TOWARD EDUCATION

Below are a number of statements about which teachers may have different opinions. Please indicate what your opinion of each statement is by circling the appropriate number after each statement.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. Boys and girls who are delinquent are, when all is said and done, basically good.	1	2	3	4	5
2. If boys and girls are to do an adequate job of learning in school, their needs for love must be met.	1	2	3	4	5
3. It is appropriate for teachers to require an additional assignment from a pupil who misbehaves in class	1	2	3	4	5
4. How a student feels about what he learns is as important as what he learns	1	2	3	4	5
5. The way to handle a pupil who tells lies is to threaten to punish him.	1	2	3	4	5
6. The high school pupil who is not interested in having dates should be commended.	1	2	3	4	5
7. Education has failed unless it has helped boys and girls to understand and to express their own feelings and experiences.	1	2	3	4	5
8. You should tell a child who masturbates that it leads to ruined health.	1	2	3	4	5
9. The classroom experiences that are the most helpful to boys and girls are the ones wherein they can express themselves creatively.	1	2	3	4	5
10. All children should be encouraged to aim at the highest academic goals.	1	2	3	4	5
11. The child who bites his nails should be shamed.	1	2	3	4	5
12. Children outgrow early emotional experiences as they do shoes and clothes	1	2	3	4	5
13. What boys and girls become as adults is more closely related to the experiences they have with each other than it is to mastery of specific subject matter.	1	2	3	4	5

		Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
14.	It is more important for students to learn to work together cooperatively than it is for them to learn how to compete.	1	2	3	4	5
15.	Some pupils are just naturally stubborn	1	2	3	4	5
16.	Students should be permitted to disagree with the teacher	1	2	3	4	5
17.	It is better for a girl to be shy and timid than "boy crazy".	1	2	3	4	5
18.	Boys and girls should learn that most of life's problems have several possible solutions and not just one "correct" one.	1	2	3	4	5
19.	The first signs of delinquency in a pupil should be received by a tightening of discipline and more restrictions	1	2	3	4	5
20.	The newer methods of education tend to standardize children's behavior	1	2	3	4	5
21.	Most boys and girls who present extreme cases of "problem behavior" are doing the best they can to get along with other people	1	2	3	4	5
22.	An activity to be educationally valuable should train reasoning and memory in general	1	2	3	4	5
23.	It is more important for a child to have faith in himself than it is for him to be obedient. . . .	1	2	3	4	5
24.	Being grouped according to ability damages the self-confidence of many boys and girls.	1	2	3	4	5
25.	Criticism of children by teachers is more effective for obtaining the desired behavior than criticism of children by others of their own age	1	2	3	4	5
26.	All questions a student asks should be recognized and considered	1	2	3	4	5
27.	The pupil who isn't making good grades should be told to study harder	1	2	3	4	5
28.	Children should not be permitted to talk without the permission of the teacher	1	2	3	4	5

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
29. A student who will not do his work should be helped in every way possible.	1	2	3	4	5
30. Boys and girls in the elementary school should be promoted regardless of whether they have completed the work for their grade or not.	1	2	3	4	5
31. The teacher should lower grades for misconduct in class.	1	2	3	4	5
32. A teacher should permit a great deal of latitude in the way he permits boys and girls to address him.	1	2	3	4	5
33. It is a good idea to tell a pupil that he can succeed in any type of work if he works hard. . . .	1	2	3	4	5
34. Students will tolerate errors and even occasional injustices in a teacher who, they feel, likes and understands them.	1	2	3	4	5
35. A teacher should accept the deficiencies and shortcomings of a student, as well as his good points. .	1	2	3	4	5
36. Each time a pupil lies his punishment should be increased	1	2	3	4	5
37. Boys and girls can learn proper discipline only if they are given sufficient freedom.	1	2	3	4	5
38. If a teacher keeps school conditions exactly the same and gives all pupils an equal opportunity to respond, he has done all he can do	1	2	3	4	5
39. If a child constantly performs for attention, the teacher should see to it that he gets no attention.	1	2	3	4	5
40. Dishonesty is a more serious personality characteristic than unsocialness	1	2	3	4	5
41. A great deal of misbehavior problem behavior results from fear and guilt	1	2	3	4	5
42. The teacher's first responsibility in all cases of misconduct is to locate and punish the offender.	1	2	3	4	5
43. It is better for boys and girls to talk about the things that bother them than to try to forget them.	1	2	3	4	5
44. Most pupils need some of the natural meanness taken out of them	1	2	3	4	5

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
45. It is more important for boys and girls to be liked and accepted by their friends than it is for them to get along with their teachers.	1	2	3	4	5
46. Teachers should answer children's questions about sex frankly and, if possible, without show of embarrassment	1	2	3	4	5
47. When a pupil obeys all the rules of the school, one can be sure he is developing moral character. . . .	1	2	3	4	5
48. When a teacher is told something in confidence by a child, he should keep the matter just as confidential as though it were entrusted to him by an adult	1	2	3	4	5
49. Since a person memorizes best during childhood, that period should be regarded as a time to store up facts for later use.	1	2	3	4	5
50. Students should play a very active part in formulating the rules for the classroom and the school.	1	2	3	4	5

ID_____

1._____

2._____

3._____

_____

School_____

Classroom_____

Teacher_____

Observer_____

OBSERVATION RATING SCALE

	no evidence	weak infrequent	moderate occasional	strong frequent evidence
1. Texts and materials are supplied in class sets so that all children may have their own.	1	2	3	4
2. Each child has a space for his personal storage and the major part of the classroom is organized for common use.	1	2	3	4
3. Materials are kept out of the way until they are distributed or used under the teacher's direction.	1	2	3	4
4. Many different activities go on simultaneously.	1	2	3	4
5. Children are expected to do their own work without getting help from other children.	1	2	3	4
6. Manipulative materials are supplied in great diversity and range, with little replication.	1	2	3	4
7. Day is divided in large blocks of time within which children, with the teacher's help, determine their own routine.	1	2	3	4
8. Children work individually and in small groups at various activities.	1	2	3	4
9. Books are supplied in diversity and profusion (including reference, children's literature).	1	2	3	4
10. Children are not supposed to move about the room without asking permission.	1	2	3	4
11. Desks are arranged so that every child can see the blackboard or teacher from his desk.	1	2	3	4
12. The environment includes materials developed by the teacher.	1	2	3	4

Appendix A-5 (continued)

	no evidence	weak infrequent	moderate occasional	strong frequent evidence
13. Common environmental materials are provided.	1	2	3	4
14. Children may voluntarily make use of other areas of the building and school yard as part of their school time.	1	2	3	4
15. The program includes use of the neighborhood.	1	2	3	4
16. Children use "books" written by their classmates as part of their reading and reference materials.	1	2	3	4
17. Teacher prefers that children not talk when they are supposed to be working.	1	2	3	4
18. Children voluntarily group and regroup themselves.	1	2	3	4
19. The environment includes materials developed or supplied by the children.	1	2	3	4
20. Teacher plans and schedules the children's activities through the day.	1	2	3	4
21. Teacher makes sure children use materials only as instructed.	1	2	3	4
22. Teacher groups children for lessons directed at specific needs.	1	2	3	4
23. Children work directly with manipulative materials.	1	2	3	4
24. Materials are readily accessible to children.	1	2	3	4
25. Teacher promotes a purposeful atmosphere by expecting and enabling children to use time productively and to value their work and learning.	1	2	3	4
26. Teacher uses test results to group children for reading and/or math.	1	2	3	4
27. Children expect the teacher to correct all their work.	1	2	3	4
28. Teacher bases her instruction on each individual child and his interaction with materials and equipment.	1	2	3	4

	no evidence	weak infrequent	moderate occasional	strong frequent evidence
29. Teacher gives children tests to find out what they know.	1	2	3	4
30. The emotional climate is warm and accepting.	1	2	3	4
31. The work children do is divided into subject matter areas.	1	2	3	4
32. The teacher's lessons and assignments are given to the class as a whole.	1	2	3	4
33. To obtain diagnostic information, the teacher closely observes the specific work or concern of a child and asks immediate, experience-based questions.	1	2	3	4
34. Teacher bases her instruction on curriculum guides or text books for the grade level she teaches.	1	2	3	4
35. Teacher keeps notes and writes individual histories of each child's intellectual, emotional, physical development.	1	2	3	4
36. Teacher has children for a period of just one year.	1	2	3	4
37. The class operates within clear guidelines made explicit.	1	2	3	4
38. Teacher takes care of dealing with conflicts and disruptive behavior without involving the group.	1	2	3	4
39. Children's activities, products, and ideas are reflected abundantly about the classroom.	1	2	3	4
40. The teacher is in charge.	1	2	3	4
41. Before suggesting any extension or redirection of activity, teacher gives diagnostic attention to the particular child and his particular activity.	1	2	3	4
42. The children spontaneously look at and discuss each other's work.	1	2	3	4
43. Teacher uses tests to evaluate children and rate them in comparison to their peers.	1	2	3	4
44. Teacher uses the assistance of someone in a supportive, advisory capacity.	1	2	3	4

	no evidence	weak infrequent	moderate occasional	strong frequent evidence
45. Teacher tries to keep all children within her sight so that she can make sure they are doing what they are supposed to do.	1	2	3	4
46. Teacher has helpful colleagues with whom she discusses teaching.	1	2	3	4
47. Teacher keeps a collection of each child's work for use in evaluating his development.	1	2	3	4
48. Teacher views evaluation as information to guide her instruction and provisioning for the classroom.	1	2	3	4
49. Academic achievement is the teacher's top priority for the children.	1	2	3	4
50. Children are deeply involved in what they are doing.	1	2	3	4

ANALYSIS OF VARIANCE FOR
PICTORIAL SELF-CONCEPT SCALE
GRADE 1

Source	SS	MS	DF	F
Treatment	4.91	4.91	1	0.13
Error	1469.50	37.68	39	
TOTAL	1474.41		40	

ANALYSIS OF COVARIANCE FOR
PICTORIAL SELF-CONCEPT. SCALE
GRADES 2-4

Source	SS	MS	DF	F
Treatment	15.94	15.94	1	0.16
Grade	22.88	11.44	2	0.11
Treatment x Grade	169.69	84.85	2	0.83
Within	9464.69	101.77	93	
TOTAL	9763.20		98	

ANALYSIS OF COVARIANCE FOR
TOTAL SCORE OF PIERS-HARRIS CHILDREN'S SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	480.06	480.06	1	6.07*
Grade	212.56	212.56	1	2.69
Treatment x Grade	0.38	0.38	1	0.00
Within	6807.06	79.15	86	
TOTAL	7500.06		89	

ANALYSIS OF COVARIANCE FOR "ANXIETY"
SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	15.19	15.19	1	3.77
Grade	0.13	0.13	1	0.03
Treatment x Grade	0.29	0.29	1	0.07
Within	346.51	4.03	86	
TOTAL	362.12		89	

ANALYSIS OF COVARIANCE FOR "POPULARITY"
SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	11.50	11.50	1	1.50
Grade	18.67	18.67	1	2.43
Treatment x Grade	3.07	3.07	1	0.40
Within	659.78	7.67	86	
TOTAL	693.02		89	

ANALYSIS OF COVARIANCE FOR "HAPPINESS
AND SATISFACTION" SUBSCALE OF PIERS-HARRIS SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	2.19	2.19	1	0.93
Grade	2.29	2.29	1	0.98
Treatment x Grade	0.92	0.92	1	0.39
Within	201.37	2.34	86	
TOTAL	206.77		89	

ANALYSIS OF COVARIANCE FOR
"BEHAVIOR" SUBSCALE OF PIERS-HARRIS CHILDREN'S SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	6.43	6.43	1	1.13
Grade	18.32	18.32	1	3.22
Treatment x Grade	7.72	7.72	1	1.36
Within	489.52	5.69	86	
TOTAL	521.99		89	

ANALYSIS OF COVARIANCE FOR "INTELLECTUAL AND SCHOOL STATUS"
SUBSCALE OF PIERS-HARRIS CHILDREN'S SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	47.96	47.96	1	4.44*
Grade	53.45	53.45	1	4.95*
Treatment x Grade	8.55	8.55	1	0.79
Within	928.84	10.80	86	
TOTAL	1038.80		89	

ANALYSIS OF COVARIANCE FOR "PHYSICAL APPEARANCE
AND ATTRIBUTES" SUBSCALE OF PIERS-HARRIS CHILDREN'S SELF-CONCEPT SCALE
GRADES 5-6

Source	SS	MS	DF	F
Treatment	32.06	32.06	1	4.58*
Grade	17.74	17.74	1	2.54
Treatment x Grade	3.09	3.09	1	0.44
Within	601.62	7.00	86	
TOTAL	654.51		89	

ANALYSIS OF VARIANCE FOR
TOTAL SCORE OF "FACES" INVENTORY
GRADE 1

Source	SS	MS	BF	F
Treatment	111.28	111.28	1	2.70
Error	1729.16	41.17	42	
TOTAL	1840.44		43	

ANALYSIS OF VARIANCE FOR "SCHOOL
LEARNING" SUBSCALE OF "FACES" INVENTORY
GRADE 1

Source	SS	MS	DF	F
Treatment	18.99	18.99	1	0.97
Error	824.74	19.64	42	
TOTAL	843.73		43	

ANALYSIS OF VARIANCE FOR
"INDEPENDENT STUDY" SUBSCALE OF "FACES" INVENTORY
GRADE 1

Source	SS	MS	DF	F
Treatment	75.96	75.96	1	18.88**
Error	168.95	4.02	42	
TOTAL	244.91		43	

ANALYSIS OF VARIANCE FOR
"SCHOOL CLIMATE" SUBSCALE OF "FACES" INVENTORY
GRADE 1

Source	SS	MS	DF	F
Treatment	19.91	19.91	1	3.14
Error	266.53	6.35	42	
TOTAL	286.44		43	

ANALYSIS OF COVARIANCE FOR TOTAL
SCORE OF "EACES" INVENTORY
GRADE 2

Source	SS	MS	DF	F
Treatment	286.63	286.63	1	8.51**
Error	1077.97	33.69	32	
TOTAL	1364.60		33	

ANALYSIS OF COVARIANCE FOR "SCHOOL
LEARNING" SUBSCALE OF "FACES" INVENTORY
GRADE 2

Source	SS	MS	DF	F
Treatment	20.73	20.73	1	1.51
Error	440.06	13.75	32	
TOTAL	460.79		33	

ANALYSIS OF COVARIANCE FOR "INDEPENDENT STUDY" SUBSCALE OF "FACES" INVENTORY
GRADE 2

Source	SS	MS	DF	F
Treatment	32.67	32.67	1	9.02**
Error	115.94	3.62	32	
TOTAL	148.61		33	

ANALYSIS OF COVARIANCE FOR "SCHOOL CLIMATE" SUBSCALE OF "FACES" INVENTORY
GRADE 2

Source	SS	MS	DF	F
Treatment	34.31	34.31	1	7.36*
Error	149.18	4.66	32	
TOTAL	183.49		33	

ANALYSIS OF COVARIANCE FOR TOTAL SCORE OF "FACES" INVENTORY
GRADES 3-6

Source	SS	MS	DF	F
Treatment	0.44	0.44	1	0.02
Grade	250.25	83.42	3	3.57*
Treatment x Grade	169.75	56.58	3	2.42
Within	3599.88	23.38	154	
TOTAL	4020.32		161	

ANALYSIS OF COVARIANCE FOR "SCHOOL LEARNING" SUBSCALE OF "FACES" INVENTORY
GRADES 3-6

Source	SS	MS	DF	F
Treatment	2.94	2.94	1	0.51
Grade	41.52	13.84	3	2.39
Treatment x Grade	42.04	14.01	3	2.42
Within	892.90	5.79	154	
TOTAL	979.40		161	

ANALYSIS OF COVARIANCE FOR "INDEPENDENT STUDY" SUBSCALE OF "FACES" INVENTORY
GRADES 3-6

Source	SS	MS	DF	F
Treatment	5.73	5.73	1	1.51
Grade	4.46	14.82	3	3.91**
Treatment x Grade	20.88	6.96	3	1.84
Within	583.23	3.79	154	
TOTAL	654.30		161	

ANALYSIS OF COVARIANCE FOR "SCHOOL CLIMATE" SUBSCALE OF "FACES" INVENTORY
GRADES 3-6

Source	SS	MS	DF	F
Treatment	0.33	0.33	1	0.06
Grade	43.38	14.46	3	2.78*
Treatment x Grade	20.35	6.78	3	1.30
Within	800.66	5.20	154	
TOTAL	864.72		161	

ANALYSIS OF COVARIANCE
FOR DAYS OF ATTENDANCE
GRADE 1

Source	SS	MS	DF	F
Treatment	3.01	3.01	1	0.69
Error	127.08	4.38	29	
TOTAL	130.09		30	

ANALYSIS OF COVARIANCE FOR DAYS OF ATTENDANCE
GRADES 2-3

Source	SS	MS	DF	F
Treatment	1.00	1.00	1	0.18
Grade	0.00	0.00	1	0.00
Treatment x Grade	1.00	1.00	1	0.18
Within	304.00	5.42	56	
TOTAL	306.00		59	

ANALYSIS OF COVARIANCE FOR DAYS OF ATTENDANCE
GRADES 4-6

Source	SS	MS	DF	F
Treatment	52.00	52.00	1	6.61*
Grade	9.00	4.50	2	0.57
Treatment x Grade	31.00	15.50	2	1.97
Within	1007.00	7.87	128	
TOTAL	1099.00		133	

ANALYSIS OF VARIANCE FOR "WORD READING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	1.21	1.21	1	3.36
Error	15.15	.36	42	
TOTAL	16.36		43	

ANALYSIS OF VARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	0.73	0.73	1	1.69
Error	18.21	0.43	42	
TOTAL	18.91		43	

ANALYSIS OF VARIANCE FOR "VOCABULARY"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	0.36	0.36	1	0.92
Error	16.30	0.38	42	
TOTAL	16.66		43	

ANALYSIS OF VARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	1.73	1.73	1	2.98
Error	24.38	0.58	42	
TOTAL	26.11		43	

ANALYSIS OF VARIANCE FOR "WORD STUDY SKILLS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	8.81	8.81	1	3.63
Error	102.02	2.43	42	
TOTAL	110.83		43	

ANALYSIS OF VARIANCE FOR "ARITHMETIC"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 1

Source	SS	MS	DF	F
Treatment	0.73	0.73	1	1.56
Error	19.75	0.47	42	
TOTAL	20.48		43	

ANALYSIS OF COVARIANCE FOR "WORD MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.22	0.22	1	0.53
Error	15.65	0.42	37	
TOTAL	15.87		38	

ANALYSIS OF COVARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.00	0.00	1	0.00
Error	23.37	0.63	37	
TOTAL	23.37		38	

ANALYSIS OF COVARIANCE FOR "SCIENCE AND SOCIAL STUDIES CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.00	0.00	1	0.00
Error	16.49	0.45	37	
TOTAL	16.49		38	

ANALYSIS OF COVARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.06	0.06	1	0.09
Error	23.36	0.63	37	
TOTAL	23.42		38	

ANALYSIS OF COVARIANCE FOR "WORD STUDY SKILLS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.78	0.78	1	0
Error	56.56	1.53	37	
TOTAL	57.34		38	

ANALYSIS OF COVARIANCE FOR "LANGUAGE"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	1.20	1.20	1	2.42
Error	18.36	0.50	37	
TOTAL	19.56		38	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC COMPUTATION"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.57	0.57	1	2.42
Error	10.26	0.28	37	
TOTAL	10.83		38	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 2

Source	SS	MS	DF	F
Treatment	0.45	0.45	1	0.91
Error	18.07	0.49	37	
TOTAL	18.52		38	

ANALYSIS OF COVARIANCE FOR "WORD MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	0.11	0.11	1	0.16
Error	21.32	0.67	32	
TOTAL	21.43		33	

ANALYSIS OF COVARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	0.94	0.94	1	
Error	31.02	0.97	32	0.97
TOTAL	31.96		33	

ANALYSIS OF COVARIANCE FOR "SCIENCE AND SOCIAL STUDIES CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	4.71	4.71	1	6.90*
Error	21.85	0.68	32	
TOTAL	26.56		33	

ANALYSIS OF COVARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	0.35	0.35	1	0.29
Error	38.79	1.21	32	
TOTAL	39.14		33	

ANALYSIS OF COVARIANCE FOR "WORD STUDY SKILLS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	3.98	3.98	1	2.15
Error	59.17	1.85	32	
TOTAL	63.15		33	

ANALYSIS OF COVARIANCE FOR "LANGUAGE"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	1.23	1.23	1	2.22
Error	17.72	0.55	32	
TOTAL	18.95		33	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC COMPUTATION"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	F
Treatment	0.00	0.00	1	0.00
Error	12.67	0.40	32	
TOTAL	12.67		33	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 3

Source	SS	MS	DF	E
Treatment	1.80	1.80	1	1.91
Error	30.20	0.94	32	
TOTAL	32.00		33	

ANALYSIS OF COVARIANCE FOR "WORD MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	0.11	0.11	1	0.05
Error	106.21	2.21	48	
TOTAL	106.32		49	

ANALYSIS OF COVARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	7.67	7.67	1	3.85
Error	95.54	1.99	48	
TOTAL	103.21		49	

ANALYSIS OF COVARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	1.77	1.77	1	0.63
Error	135.34	2.82	48	
TOTAL	137.11		49	

ANALYSIS OF COVARIANCE FOR "WORD STUDY SKILLS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	4.45	4.45	1	1.85
Error	115.40	2.40	48	
TOTAL	119.85		49	

ANALYSIS OF COVARIANCE FOR "LANGUAGE"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	1.87	1.87	1	1.18
Error	76.21	1.59	48	
TOTAL	78.08		49	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC COMPUTATION"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	7.66	7.66	1	13.59**
Error	27.03	0.56	48	
TOTAL	34.69		49	

ANALYSIS OF COVARIATE FOR "ARITHMETIC CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	2.70	2.70	1	1.97
Error	65.80	1.37	48	
TOTAL	68.50		49	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC APPLICATIONS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 4

Source	SS	MS	DF	F
Treatment	8.89	8.89	1	9.40**
Error	45.40	0.95	48	
TOTAL	54.29		49	

ANALYSIS OF COVARIANCE FOR "WORD MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	0.12	.12	1	0.14
Error	44.27	.90	49	
TOTAL	44.39		50	

ANALYSIS OF COVARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	0.28	0.28	1	0.30
Error	45.57	0.93	49	
TOTAL	45.85		50	

ANALYSIS OF COVARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	3.36	3.36	1	2.05
Error	80.26	1.64	49	
TOTAL	83.62		50	

ANALYSIS OF COVARIANCE FOR "LANGUAGE"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	5.25	5.25	1	5.62*
Error	45.77	0.93	49	
TOTAL	51.02		50	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC COMPUTATION"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	0.47	0.47	1	0.66
Error	34.73	0.71	49	
TOTAL	35.19		50	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC APPLICATIONS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	0.47	0.47	1	0.58
Error	39.91	0.81	49	
TOTAL	40.38		50	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 5

Source	SS	MS	DF	F
Treatment	0.46	0.46	1	0.86
Error	26.36	0.54	49	
TOTAL	26.36		50	

ANALYSIS OF COVARIANCE FOR "WORD MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	7.93	7.93	1	5.55*
Error	75.78	1.43	53	
TOTAL	83.71		54	

ANALYSIS OF COVARIANCE FOR "PARAGRAPH MEANING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	0.50	0.50	1	0.35
Error	76.58	1.44	53	
TOTAL	77.08		54	

ANALYSIS OF COVARIANCE FOR "SPELLING"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	0.98	.98	1	
Error	133.20	2.51	53	0.39
TOTAL	134.18		54	

ANALYSIS OF COVARIANCE FOR "LANGUAGE"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	3.75	3.75	1	3.31
Error	60.06	1.13	53	
TOTAL	63.81		54	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC COMPUTATION"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	0.40	0.40	1	0.32
Error	66.27	1.25	53	
TOTAL	66.67		54	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC CONCEPTS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	0.00	0.00	1	0.00
Error	76.06	1.44	53	
TOTAL	76.06		54	

ANALYSIS OF COVARIANCE FOR "ARITHMETIC APPLICATIONS"
SUBSCALE OF STANFORD ACHIEVEMENT TEST
GRADE 6

Source	SS	MS	DF	F
Treatment	16.43	16.43	1	8.52**
Error	102.25	1.93	53	
TOTAL	118.69		54	

ANALYSIS OF VARIANCE FOR PRE- AND POSTTEST
SCORES OF EXPERIMENTAL TEACHERS ON
"OPINIONNAIRE ON ATTITUDES TOWARD EDUCATION"

Source	SS	MS	DF	F
Between	90.00	90.00	1	1.29
Error	558.00	69.75	8	
TOTAL	648.00		9	

ANALYSIS OF COVARIANCE FOR TEACHER
SCORES ON "OPINIONNAIRE ON ATTITUDES TOWARD EDUCATION"

Source	SS	MS	DF	F
Between	23.10	23.10	1	0.62
Error	261.84	37.41	7	
TOTAL	284.94		8	

REPEATED MEASURES ANALYSIS OF
VARIANCE FOR OPEN CLASSROOM SCHOOL OBSERVATION DATA

Source	SS	MS	DF	F
Subjects	1,261	252.20	5	
Treatment (Observations)	10,788	829.84	13	30.63**
Error	1,761	27.09	65	
TOTAL	13,810		83	

REPEATED MEASURES ANALYSIS OF
VARIANCE FOR COMPARISON SCHOOL CLASSROOM OBSERVATION DATA

Source	SS	MS	DF	F
Subjects	3,038	607.60	5	
Treatment (Observations)	12,360	950.76	13	8.93**
Error	6,917	106.41	65	
TOTAL	22,315		83	

ANALYSIS OF VARIANCE FOR
CLASSROOM OBSERVATION DATA

Source	SS	MS	DF	F
Between	1950.78	1950.78	1	63.43**
Error	307.53	30.75	10	
TOTAL	2258.31		11	

APPENDIX C

CORRELATIONS BETWEEN COVARIATE AND CRITERION FOR ANALYSES OF COVARIANCE*

A. Self-Concept

1. Grades 1, 2 and 3	
Pictorial Self-Concept Scale	.01
2. Grades 5 and 6	
Piers-Harris Total Score	.62
Piers-Harris "Behavior" Subscale	.45
Piers-Harris "Intellectual and School Status" Subscale	.45
Piers-Harris "Physical Appearance and Attributes" Subscale	.45
Piers-Harris "Anxiety" Subscale	.52
Piers-Harris "Popularity" Subscale	.28
Piers-Harris "Happiness and Satisfaction" Subscale	.50

B. Attitude Toward School

1. "Faces" Inventory - Grade 2	
"Faces" Inventory Total Score	.35
"Faces" Inventory "School Learning" Subscale	.17
"Faces" Inventory "Independent Study" Subscale	.23
"Faces" Inventory "School Climate" Subscale	.22
2. "Faces" Inventory - Grades 3-6	
"Faces" Inventory Total Score	.51
"Faces" Inventory "School Learning" Subscale	.54
"Faces" Inventory "Independent Study" Subscale	.30
"Faces" Inventory "School Climate" Subscale	.38
3. Days of Attendance	
Grade 1	.13
Grades 2 and 3	.52
Grades 4, 5 and 6	.79

C. Academic Achievement

1. Grade 2	
Word Meaning	.75
Paragraph Meaning	.65
Science and Social Studies Concepts	.67
Spelling	.58
Word Study Skills	.60

Language	.52
Arithmetic Computation	.47
Arithmetic Concepts	.62
2. Grade 3	
Word Meaning	.56
Paragraph Meaning	.48
Science and Social Studies Concepts	.39
Spelling	.58
Word Study Skills	.37
Language	.50
Arithmetic Computation	.51
Arithmetic Concepts	.55
3. Grade 4	
Word Meaning	.56
Paragraph Meaning	.48
Spelling	.39
Word Study Skills	.58
Language	.37
Arithmetic Computation	.50
Arithmetic Concepts	.51
Arithmetic Applications	.55
4. Grade 5	
Word Meaning	.77
Paragraph Meaning	.76
Spelling	.67
Language	.76
Arithmetic Computation	.45
Arithmetic Concepts	.70
Arithmetic Applications	.62
5. Grade 6	
Word Meaning	.74
Paragraph Meaning	.72
Spelling	.77
Language	.81
Arithmetic Computation	.53
Arithmetic Concepts	.61
Arithmetic Applications	.62
D. Teacher Attitudes	
Opinionnaire on Attitudes Toward Education	.26

*All correlations reported here are between pre- and post-administrations of the same instrument, except for those in the academic achievement section. The correlations reported here are between scores on the Otis-Lennon Mental Abilities Test and scores on the various subscales of the Stanford Achievement Test.

APPENDIX D

RESPONSES TO PARENT AND PUPIL QUESTIONNAIRES

Given at Sporting Hill School - January 1973

Parent Response to Open Concept Evaluation

Participants - 122 parents returned the questionnaire

1. My child seemed to adjust to the new "open" program.

60.5 per cent	a.	Immediately
27.2 per cent	b.	After the first week
12.3 per cent	c.	Gradually
	d.	Never

2. Did your child ever comment that he did not want to attend school before this year?

37.6 per cent	a.	Yes	62.4 per cent	b. No

3. Did your child ever comment that he did not want to attend school this school year?

16.1 per cent	a.	Yes	83.9 per cent	b. No

4. Are you pleased with the "open" program?

85.3 per cent	a.	Yes
11.9 per cent	b.	No
2.8 per cent	c.	No Response

5. Do you feel the program is realistic?

83.5 per cent	a.	Yes
9.1 per cent	b.	No
7.4 per cent	c.	No Response

6. My child seems to like this school and enjoys the program.

96.6 per cent	a.	Yes
.9 per cent	b.	No
2.5 per cent	c.	No Response

7. Would you suggest having some of the activities of this school incorporated into other schools of this district?

72.6 per cent	a.	Yes
11.0 per cent	b.	No
16.4 per cent	c.	No Response

8. Does your child seem to accept the responsibility of working on his own?

84.6 per cent	a.	Yes
8.1 per cent	b.	No
7.3 per cent	c.	No Response

9. Does too much independent time to do school work in a classroom or school hinder a child's academic progress?

22.1 per cent	a.	Yes
61.4 per cent	b.	No
16.5 per cent	c.	No Response

10. Is your child's interest at heart by the teachers as a result of the "open" program at Sporting Hill?

76.7 per cent	a.	Yes
6.0 per cent	b.	No
18.3 per cent	c.	No Response

11. Did you obtain satisfaction from the Progress Report procedure used to report the progress of your child?

75.6 per cent	a.	Yes
17.1 per cent	b.	No
7.3 per cent	c.	No Response

12. My child likes the following things about Sporting Hill: (Recorded are the number of instances the general topic was mentioned.)

44	a.	"Movin-&-Groovin"
30	b.	The informal atmosphere of the school and staff members
29	c.	Teachers!
24	d.	Everything!
19	e.	To be given the responsibility of doing independent work
16	f.	Carpet!
11	g.	Individualized instruction
11	h.	Learning stations
9	i.	Doing contracts in various subjects

13. My child dislikes Sporting Hill because of the following reasons:

5	a.	Lack of individual desks
4	b.	Having tubs to keep belongings in
4	c.	Student teachers leaving
3	d.	Bus problems
3	e.	Mr. Balmer leaving

14. Please feel free to make any other comments about the "open" program as you have seen in this year at Sporting Hill.

15 a. A wonderful program!
5 b. The program provides a better opportunity for social adjustment and opportunity to assume responsibilities.
5 c. Individual differences are accepted.
5 d. The staff works hard.
5 e. The informal atmosphere is looked upon as a negative characteristic.
5 f. Better discipline is needed.

15. Would you be willing to make your thoughts public about the "open" program?

42 a. Yes
52 b. No
35 c. No Response

60 In favor of the program
12 Not in favor of the program
41 No Response
6 Not sure at this time.

Given at Sporting Hill School - January 1973

Pupil Response to Open Concept Evaluation

Participants - 133 pupils in Grades 1-6

1. How do you compare Sporting Hill School this year to last year's school?

88 per cent	a.	This year is more interesting
3 per cent	b.	This year is less interesting
8 per cent	c.	It is the same
1 per cent	d.	No response

2. How often did you feel as though you didn't want to come to school this year?

26 per cent	a.	Never
41 per cent	b.	Sometimes
19 per cent	c.	Often
13 per cent	d.	Always
1 per cent	e.	No response

3. How often did you feel as though you didn't want to come to school this year?

70 per cent	a.	Never
20 per cent	b.	Sometimes
5 per cent	c.	Often
5 per cent	d.	Always

4. Do you enjoy the freedom of this school?

97 per cent a. Yes 3 per cent b. No

5. Do you want this school to continue as it is now?

97 per cent a. Yes 3 per cent b. No

6. Do you think other schools in this school district should be like this school?

77 per cent	a.	Yes
20 per cent	b.	No
3 per cent	c.	No response

7. I like this school because:
(Recorded are the number of instances the general topic was mentioned.)

68 a. "Movin-and-Groovin"

53 b. The freedom to move from area to area in doing work.
46 c. The teachers are nice.
37 d. Carpet!
36 e. Doing contracts in various subjects and the free use of time after the contracts are completed.
32 f. Individualized instruction and to be able to work at one's own speed.
21 g. In doing school work it still is fun.
18 h. Math (individualized and contracted)
16 i. Reading - Language Arts (individualized and contracted)
14 j. Having many audio-visual materials available for use.

8. I dislike this school because:
(Recorded are the number of instances the general topic was mentioned.)

52 a. Nothing (Either the word "nothing" was written or there was no response.)
23 b. Do not like carrying the tubs, and the tubs are not substantial.
10 c. Sometimes too noisy
9 d. Would like to have own desk
6 e. Bus problems
6 f. Teachers leaving
5 g. Dislike science
5 h. Teachers leaving room. (All related to the head teacher being called out.)

9. Make any other suggestion or comment about this school you wish.
(Recorded are the number of instances the general topic was mentioned.)

8 a. "Movin-and-Groovin" should be longer.
7 b. Have more recesses or have longer recesses.
7 c. Favorable comments about teachers or staff members
6 d. We like it! or We love it!
5 e. Would like to have better tubs
4 f. Like the carpet
4 g. Would like to have own desks
3 h. Like Thursday's early dismissal
3 i. Like contracts
3 j. Wish they could eat in the hall.

RESPONSES TO QUESTIONNAIRE ADMINISTERED TO PARENTS OF SPORTING HILL STUDENTS IN MAY 1974*

1. I'm glad that my child is attending the "open classroom" school.

   Yes 65.67 per cent Undecided 23.88 per cent No 10.44 per cent

2. I feel that my child is getting more attention in school now.

   Yes 68.66 per cent Undecided 20.90 per cent No 10.45 per cent

3. My child seems to like school more now.

   Yes 75.38 per cent Undecided 15.38 per cent No 9.23 per cent

4. My child says more positive and nice things about school and his teachers than before.

   Yes 58.73 per cent Undecided 26.98 per cent No 14.28 per cent

5. My child seems more enthusiastic about school and learning now.

   Yes 76.56 per cent Undecided 12.50 per cent No 10.94 per cent

6. My child's self-image (how he feels about himself) has improved because of the "open classroom" school.

   Yes 38.10 per cent Undecided 50.79 per cent No 11.11 per cent

7. Because of the "open classroom" school, I notice that my child has more self-control than before.

   Yes 26.98 per cent Undecided 49.21 per cent No 23.81 per cent

*69.70 per cent (67. of 96) of the families with a child or children at Sporting Hill returned a questionnaire.

APPENDIX E

CORRELATION MATRICES--GRADES 1-6*

With one exception, IQ scores, individual 1974 posttest scores were used to compute the correlations reported herein. The IQ scores used were those attained by students on the most recent administration of the Otis-Lennon Mental Ability Test.

CORRELATIONS AMONG GRADE 1 VARIABLES
(N: 32-44)

		1	2	3	4	5	6	7	8	9	10	11
1	Word Reading											
2	Paragraph Meaning	83*										
3	Vocabulary	57*	49*									
4	Spelling	86*	80*	52*								
5	Word Study Skills	89*	81*	58*	89*							
6	Arithmetic	53*	48*	47*	55*	66*						
7	Faces--School Learning	29*	32*	14	29*	20	07					
8	Faces--Independent Study	24	27	-02	29*	30*	13	05				
9	Faces--School Climate	37*	38*	25	36*	37*	35*	47*	39*			
10	Faces--Total Score	41*	43*	17	42*	38*	23	80*	55*	82*		
11	Pictorial Self-Concept Scale	-15	-01	-22	-09	-04	10	17	31*	30*	33*	
12	Days of Attendance	-13	-16	07	04	-05	-32	25	01	-06	12	11

Variables:

1 - 6	Cognitive Achievement
7 -10	Attitude Toward School
11	Self-Concept
12	Days of Attendance

*Significant beyond .05 level

CORRELATIONS AMONG GRADE 2 VARIABLES
(N: 27-40)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Otis-Lennon (IQ)														
2	Word Meaning	75*													
3	Paragraph Meaning	65*	79*												
4	Science and Social Studies Concepts	67*	59*	60*											
5	Spelling	58*	83*	84*	48*										
6	Word Study Skills	60*	68*	71*	45*	66*									
7	Language	52*	56*	48*	26	60*	57*								
8	Arithmetic Computation	47*	49*	52*	38*	44*	45*	20*							
9	Arithmetic Concepts	62*	70*	63*	49*	63*	51*	39*	57*						
10	Faces--School Learning	01	02	14	10	10	30	-09	17	16					
11	Faces--Independent Study	02	-06	-01	-03	07	26	20	03	02	07				
12	Faces--School Climate	-19	-03	-04	-21	00	12	-17	-15	14	64*	24			
13	Faces--Total Score	-06	-02	07	-03	09	30	-05	05	15	87*	47*	84*		
14	Pictorial Self-Concept Scale	13	12	-08	03	-04	11	-15	01	07	24	18	43*	37	
15	Days of Attendance	-12	13	-05	-15	02	-15	-06	-05	20	30	-06	52*	35*	56*

Variables:

1	IQ
2- 9	Cognitive Achievement
10-13	Attitude Toward School
14	Self-Concept
15	Days of Attendance

*Significant beyond .05 level

CORRELATIONS AMONG GRADE 3 VARIABLES
(N: 28-31)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Otis-Lennon (IQ)														
2	Word Meaning	60*													
3	Paragraph Meaning	61*	81*												
4	Science and Social Studies Concepts	47*	42*	53*											
5	Spelling	45*	63*	67*	26										
6	Word Study Skills	58*	62*	70*	38*	78*									
7	Language	55*	67*	78*	38*	74*	85*								
8	Arithmetic Computation	57*	51*	48*	27	73*	50*	53*							
9	Arithmetic Concepts	65*	61*	67*	44*	62*	68*	77*	68*						
10	Faces--School Learning	01	01	21	-09	12	44*	41*	-19	05					
11	Faces--Independent Study	07	04	-09	-29	20	26	18	07	05	29				
12	Faces--School Climate	-06	-21	-02	-17	-07	18	21	-32	-07	80*	36*			
13	Faces--Total Score	01	-07	07	-21	10	37*	34	-19	01	90*	61*	91*		
14	Pictorial Self-Concept Scale	23	48*	38*	04	36	42	34	00	11	22	00	-02	10	
15	Days of Attendance	00	-10	-06	-12	-20	-10	-09	-28	12	21	05	23	21	18

Variables:

1	IQ
2 - 9	Cognitive Achievement
10-13	Attitude Toward School
14	Self-Concept
15	Days of Attendance

*Significant beyond .05 level

CORRELATIONS AMONG GRADE 4 VARIABLES

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Otis-Lennon (IQ)														
2	Word Meaning	56*													
3	Paragraph Meaning	48*	82*												
4	Spelling	39*	80*	80*											
5	Word Study Skills	58*	78*	83*	71*										
6	Language	37*	51*	57*	53*	59*									
7	Arithmetic Computation	50*	64*	63*	56*	73*	64*								
8	Arithmetic Concepts	51*	52*	65*	53*	75*	66*	69*							
9	Arithmetic Applications	55*	76*	77*	70*	80*	55*	71*	64*						
10	Faces--School Learning	-04	-14	-09	-20	00	-06	-04	09	-03					
11	Faces--Independent Study	33*	40	28*	13	32*	30*	25	22	37*	-04				
12	Faces--School Climate	09	21	-02	16	19	11	03	01	21	25	29*			
13	Faces--Total Score	20	23	09	04	26	18	16	17	28*	62*	63*	74*		
14	Pictorial Self-Concept Scale	07	14	26	14	19	21	08	30*	24	18	08	18	22	
15	Days of Attendance	04	-12	-21	-16	-17	-20	-21	-32*	-03	11	-06	08	07	-03

Variables:

1	IQ
2 - 9	Cognitive Achievement
10-13	Attitude Toward School
14	Self-Concept
15	Days of Attendance

*Significant beyond .05 level

CORRELATIONS AMONG GRADE 5 VARIABLES
(N: 41-55)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Otis-Lennon (IQ)																			
2	Word Meaning	77*																		
3	Paragraph Meaning	76*	73*																	
4	Spelling	67*	61*	67*																
5	Language	76*	62*	68*	61*															
6	Arithmetic Computation	46*	39*	48*	44*	55*														
7	Arithmetic Concepts	70*	55*	61*	54*	74*	43*													
8	Arithmetic Applications	62*	56*	66*	38*	65*	45*	72*												
9	Faces--School Learning	23	26	34*	43*	22	20	21	16											
10	Faces--Independent Study	27	40*	27	33*	32*	25	26	24	49*										
11	Faces--School Climate	27	28*	40*	28*	30*	35	14	16	56*	49*									
12	Faces--Total Score	30*	37*	41*	42*	33*	32	25	22	88*	75*	82*								
13	Piers-Harris Total Score	32*	24	16	02	23	19	27*	36*	07	22	30*	22							
14	Behavior	36*	29*	29*	26	31*	36	26	39*	20	17	30*	27*	73*						
15	Intellectual and School Status	22	22	04	-02	21	05	21	24	12	25	28*	24	85*	56*					
16	Physical Appearance	-08	-05	-23	-30*	-14	-09	-04	-04	-24	12	03	-08	66*	22	63*				
17	Anxiety	35*	19	15	094	16	01	36*	31*	-07	07	06	01	67*	31*	55*	45*			
18	Popularity	02	10	-05	-33*	-06	07	-13	05	-11	11	20	05	72*	28*	57*	69*	39*		
19	Happiness	35*	24	25	12	32*	36*	29*	53*	12	23	24	22	70*	50*	51*	32*	46*	53*	
20	Days of Attendance	25	16	12	25	08	06	16	-04	00	-02	-12	-06	-05	-10	-07	-14	32*	-26	-16

Variables:

1	IQ
2- 8	Cognitive Achievement
9-12	Attitude Toward School
13-19	Self-Concept
20	Days of Attendance

*Significant beyond .05 level

CORRELATIONS AMONG GRADE 6 VARIABLES
(N: 41-55)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Otis-Lennon (IQ)																			
2	Word Meaning	74*																		
3	Paragraph Meaning	73*	79*																	
4	Spelling	77*	80*	73*																
5	Language	81*	83*	72*	88*															
6	Arithmetic Computation	54*	41*	50*	60*	66*														
7	Arithmetic Concepts	61*	59*	67*	60*	63*	58*													
8	Arithmetic Applications	63*	63*	67*	67*	73*	62*	75												
9	Faces--School Learning	-06	-07	03	-05	06	38*	07	05											
10	Faces--Independent Study	-2	-24	-21	-23	-13	07	-20	-07	38*										
11	Faces--School Climate	-01	-06	00	-10	07	23	01	-02	69*	38*									
12	Faces--Total Score	-07	-13	-05	-13	02	30*	-02	00	90*	64*	88*								
13	Piers-Harris Total Score	22	23	15	05	16	20	16	25	07	25	33*	25							
14	Behavior	07	09	07	00	05	20	05	07	24	01	40*	30*	70*						
15	Intellectual and School Status	34*	34*	29*	14	26	20	31*	43*	14	30*	31*	29*	87*	56*					
16	Physical Appearance	11	19	12	-01	03	07	17	24	-09	37*	01	07	76*	25	74*				
17	Anxiety	19	-20	05	08	20	17	16	25	-07	20	12	08	75*	31*	57*	58*			
18	Popularity	07	10	-03	-11	-02	-17	00	09	-20	-15	03	-04	81*	42*	67*	73*	64*		
19	Happiness	23	15	06	07	12	16	09	07	-10	-01	22	04	61*	34*	32	34*	58*	47*	
20	Days of Attendance	10	-02	-08	07	08	05	04	04	08	00	09	08	06	13	00	-02	16	06	10

Variables:

1	IQ
2- 8	Cognitive Achievement
9-12	Attitude Toward School
13-19	Self-Concept
20	Days of Attendance

*Significant beyond .05 level