1973

A study of open space schools

Carol Ormiston
Portland State University

A STUDY OF OPEN SPACE SCHOOLS

by

CAROL ORMISTON

A report submitted in partial fulfillment of the

requirements for the degree of

MASTER OF

SOCIAL WORK

Portland State University

1973

TABLE OF CONTENTS

TABLES

FIGURES

INTRODUCTION

> "Children need to be themselves, to live with other children and with grownups, to learn from their environment, to enjoy the present, to get ready for the future, to create and to love, to learn to face adversity, to behave responsibly, in a word, to be human beings."
>
> ---Children and Their Primary Schools
> A report of the Central Advisory
> Council for Education (England) 1967

This quote embodies the spirit of education; proponents of open space schools feel they are more likely to meet these humanistic goals than traditional schools.

By the spring of 1972 Beaverton School District had five open space schools in operation and three others under construction. These schools are built without separate, individual classrooms. Space is more flexible and can be used in a number of ways. Open space buildings provide the setting for a new kind of teaching and learning process.

Within the Beaverton School District, the Department of Administrative Services was requested to provide information regarding the operation of the open space teaching and learning process. As a result a plan was developed for a descriptive study of some aspects of open space as practiced in the Beaverton School District. The study was begun in March, 1972 and will continue through June, 1973. This paper is an interim report; the final report will be written upon completion of the study.

The presentation will describe the theory of open space, the overall plan of the study, the research design, and the data which has been collected through June, 1973.

THE THEORY OF OPEN SPACE

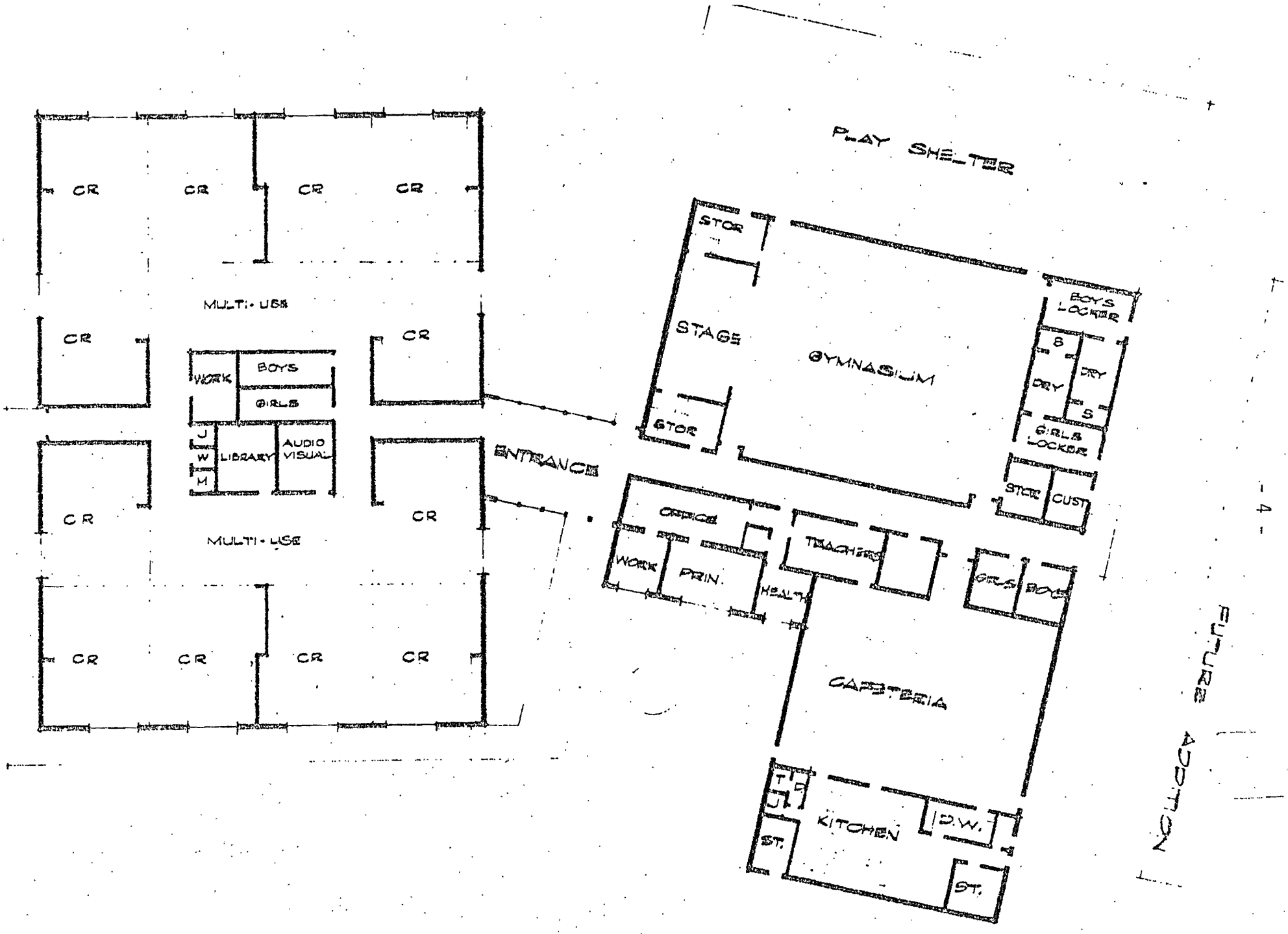
The first step in the study was to gain a theoretical understanding of open space by reviewing the literature, observing schools in operation and talking with principals and teachers who were then involved with open space.

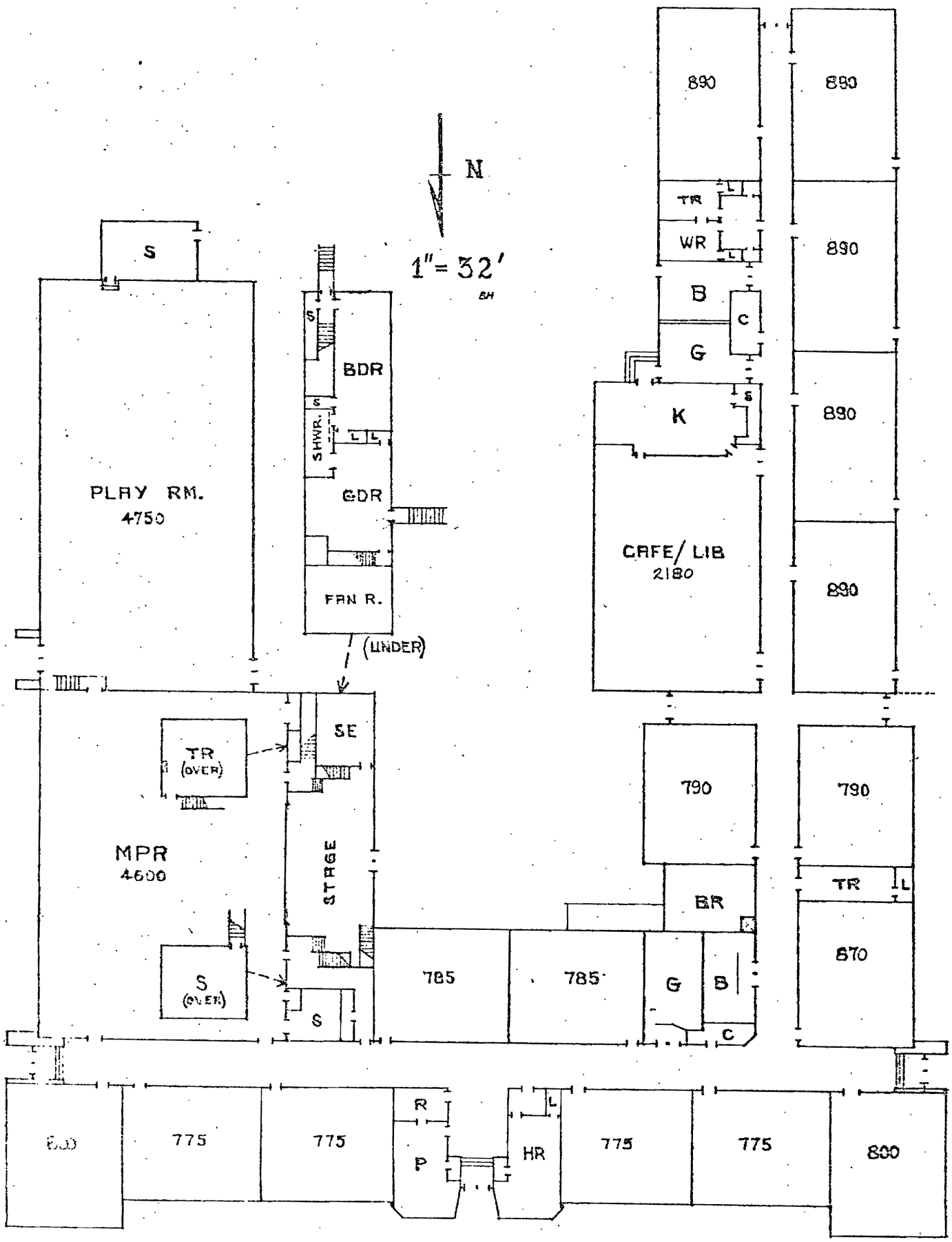
In reviewing the literature it is clear that the physical building is only one aspect of open space theory. The environment which is created in the building and the teaching and learning process (sometimes known as "open space concept") which grows out of that environment are also important aspects. In the literature the three aspects (i.e., the building, the environment, and the process) are so interrelated that the term "open space" is used interchangeably for all of them. For purposes of clarity in this paper they will be differentiated. The expectation is that the flexible use of space in an "open" building will facilitate the creation of an "open" environment and the use of the "open" teaching and learning process. However, it is possible to use an open building for the traditional or closed type of teaching; and it is possible to use the open teaching and learning process in a self-contained classroom in which an open environment has been created.

The building of an open space school appears on the outside much like any other school, but within there is not the usual individual classrooms typically connected by long hallways. Instead there are class areas separated in many ways such as movable walls, screens, bookcases, cabinets, or just unobstructed inner space. Frequently, these class areas are grouped around the outside of the building and

open onto central resource area which houses the library, tape recorders and other teaching equipment. (See Figure 1 and 2 for a visual contrast of an open space building and a closed or traditional building.) Often in an open space school, the only kind of areas that are enclosed with walls are bathrooms, janitor closets, kitchens, etc. The floors of open areas are carpeted and the ceilings finished so as to keep the noise level as low as possible. When one enters a school like this, the activities of several classes can be seen at one time (assuming that any movable walls are open) and there is a feeling of spaciousness, openness, and much activity.

The open environment is rich in learning resources spanning a wide range of interests and degrees of difficulty. Concrete materials that can be explored, manipulated and handled are included as well as books, tape recorders, and other easily accessible equipment. These are often arranged into several interest areas or resource centers. An example might be a science center which houses rocks and shells, leaves and flowers, turtles and hamsters, batteries and wires, and anything else which draws the interest of students. There is color and brightness through displaying artwork and hanging mobiles. In place of the usual rows of desks facing the teacher at the front of the class there are groups of tables and chairs that can be moved and rearranged easily. The arrangement of furniture and resource centers encourages activity, communication and a free flow of movement. The environment is in a sense a smorgasbord of stimuli which through visual, auditory and tactile openness sets the stage for and facilitates choice-making and decision-making.


CR
CR
CR
CR
MULTI-USE
CR
CR
WORK
BOYS
GIRLS
J
W
M
LIBRARY
AUDIO VISUAL
CR
CR
MULTI-USE
CR
CR
CR
CR
ENTRANCE
PLAY SHELTER
STOR
STAGE
GYMNASIUM
STOR
BOYS LOCKER
B
DRY
DRY
S
GIRLS LOCKER
STOR
CUST
OFFICE
WORK
PRIN.
HEALTH
TEACHING
GIRLS
BOYS
CAFETERIA
T
KITCHEN
P.W.
ST.
ST.
FUTURE AUDITION


N
1"= 32'
BH
S
PLAY RM.
4750
BDR
SHWR.
GDR
FAN R.
(UNDER)
TR
(OVER)
SE
MPR
4600
STAGE
S
(OVER)
S
890
890
TR
WR
890
B
C
G
K
890
CAFE/ LIB
2180
890
790
790
BR
TR
870
785
785
G
B
C
R
P
HR
775
775
775
775
800

The open teaching and learning process is not specifically defined in the literature. For purposes of this study, the process is defined by characteristics of teacher and student behaviors. The basic education a child receives from this process is like that of traditional education in that reading, writing, math and other subjects are taught; but the process is different in that it emphasizes acquisition of knowledge by the child rather than transmission of knowledge by the teacher.

Open space theory has been derived primarily from the research findings of Jean Piaget, who for over forty years has been studying the development of children's mental processes. His findings include the following: 1) "the fact that intelligence or knowledge derives from action, 2) there are major stages in mental development, and 3) a child's capabilities and limitations in each stage have vital consequences for the ways in which he or she can learn most effectively."[1]

From these findings educators have developed four assumptions which are the basis for open space theory: 1) for learning to be effective, the child must actively participate or discover, by experience, for himself; 2) each child is different with his own unique capabilities to learn in different ways and at different times; 3) each child deserves the opportunity to develop his individual potential to the fullest; 4) learning is part of growing and given the opportunity, a child will learn. Given these assumptions, education becomes not a means to an end, but a process which each child will incorporate and use in his own unique way throughout the rest of his life. The goal of this type of education is to develop students who are responsible, self-respecting, independent, self-disclipined, and cooperative.

The emphasis in the open teaching and learning process is on the child, on learning rather than teaching. This does not mean the teacher is of little importance. What it does mean is that a teacher's role is different. Rather than impart information, teachers show children how to discover for themselves and how to learn from experience. Larry Frase of Arizona State University states that, "This responsibility can be divided into three segments; 1) stimulating inquiry and investigation; 2) arranging for individuals and small groups to interact at thinking and feeling levels; and 3) guiding reflective thinking to build deeper meanings and clearer values."[2] These actions encourage students to think independently and to actively acquire knowledge rather than passively receive knowledge.

With guidance from teachers, students are encouraged to choose what is best suited to them at any one time. Edwald B. Nyquist states in an article on open space that, "Learning is more effective if it grows out of the interests of the learner in a free, supportive, non-threatening environment."[3] Generally, first graders are not as capable of coping with the variety and quantity of decisions as a sixth grader, so the number of available choices increases as the child matures. When students are first faced with this kind of experience they may misuse responsibility and make unfortunate decisions, but "these mistakes are a vital element in the development of self-responsibility."[4] Freedom of movement is encouraged so students can take advantage of the many resources and learning opportunities available to them.

Communication and contact between teachers and children, and children and children, are fostered and becomes an important part of the

learning process. These relationships provide satisfaction of the human needs of acceptance and achievement. The increased contact with others in an open situation provides an opportunity for trust and self respect in children to develop.[5] With this approach, students develop the confidence and the freedom to be self-directed and to move at their own individual speed.

The open teaching and learning process does away with many of the artificial rules which are imposed in a closed or traditional classroom. Rules characteristic of traditional classrooms attempt to keep children quiet and still. Since talk and movement are natural to children, these rules create discipline problems which tend to disappear in an open space situation which allows children these natural freedoms. However, in the open space school freedom is not equated with permissiveness. Herbert R. Kohl in his book The Open Classroom states that,

> "In an authoritarian classroom annoying behavior is legislated out of existence. In a 'permissive'classroom the teacher pretends it isn't annoying... In an open situation the teacher tries to express what he feels and to deal with each situation as a communal problem...the teacher must be as much himself as the pupils are themselves."[6]

Many methods are used to implement the open teaching and learning process. A primary one is individualized instruction which Vincent Rogers states is more than,

> "allowing for differences in speed when moving through some particular program...one individualizes by injecting humor into a lesson when a student seems to need it, and quickly becoming serious when he is ready to settle down to work; it means thinking of examples that are uniquely relevant to the student's previous experience and offering them at just the right time; it means feeling concerned over whether or not a student is progressing, and communicating that concern in a way that will be helpful; it means offering appropriate praise...because the student's performance is deserving of human admiration; it means, in short, responding as an individual to an individual."[7]

Another method of practicing the open process is to use small, temporary and constantly changing groups in which children actively learn together; the more advanced students help those who are not so far along. Piaget talks about this idea when he states, "When I say 'active' I mean it in two senses. One is acting on material things. But the other means doing things in social collaboration, in a group effort...where children must communicate with each other. This is an essential factor in intellectual development. Cooperation is indeed co-operation."[8]

For the open process to be effective teachers plan together, learn from each other, and take advantage of specialties through team teaching. Teachers are visible to one another in an open space building and sharing with one another becomes an essential element in staff relationships. In place of the traditional evaluation or grading system at the end of each term, non-graded classes may be combined with constant on-going evaluation. The child is not in competition with others; he is assessed continually only in terms of his own progress and potential.

Based on the foregoing theory of open space, indications that the open teaching and learning process is being used are as follows:

1. A teacher will be a facilitator.
2. A teacher will work with students individually and in small groups as well as large groups.
3. A teacher will not spend a lot of time disciplining students.
4. Teacher-teacher relationships will be built on trust and sharing.
5. Students have a choice in selecting what they do.
6. Students in a class will be working on different activities at the same time.
7. Students will be moving freely around the room or area.
8. Students will use resources frequently.
9. Students will be attending to school-related activities.
10. Students will be talking with one another regarding school activities.
11. Students and teachers will be talking with one another.
12. Many of the verbal contacts will be initiated by the student.
13. Students will be working individually in small groups as well as in large groups.
14. Students cognitive abilities in open space schools will be at least as great as those abilities of students from traditional schools.

These indicators have been operationalized by different components of the research.

The teachers' interview asks about attitudes regarding indicators

2, 3, 4, 5 and 7. Observation of teachers' looks at indicators 2, 3, 11 and 12. Observations of students' look at indicators 5, 6, 7, 8, 9, 10, 11 and 13. The recess observations look at indicators 10, 11 and 13. The student questionnaire asks about attitudes regarding indicators 5, 6, 8, 9 and 10. The standardized test covers indicator 14.

THE OVERALL PLAN

Do teachers in open space buildings in the Beaverton School District use the open teaching and learning process? There is no value judgment being placed on open space theory in this paper. The District is constructing open buildings and wants to know if the open process is being used.

The buildings of the open space schools in the District are constructed with varying degrees of openness. In some schools, the entire building was planned as open space, while in others only an added or remodeled portion was planned as open space. The principals of the school have a high degree of building autonomy and set the tone and "personality" of their school. The population of each school is different and the problems encountered are different. Even the inservice training for each school may be different. The principals in conjunction with their staff have chosen which parts if any of the open theory to utilize in their teaching program. Thus, the program at each school is unique and the possibility for a valid comparison between a closed school and an open school is impossible. In place of a rigid comparison, this study will describe what degree of open techniques are used in open space schools and what degree of open techniques are used in conventional schools, using two randomly selected schools of each type in order to get a measure of variability within each type.

The design includes a longitudinal component as well as the cross sectional component just described. A unique opportunity to gather before and after measures presented itself when the study was in the planning stage. A large section of Fir Grove School had been burned down and was

in the process of being replaced by an open building. The school continued to operate during construction following a traditional model with the use of portable classrooms. The principal and staff of the school decided to experiment with the use of the open teaching and learning process in order to make the best possible use of the new building. In the spring of 1972 data was collected from Fir Grove before the switch to the open concept occurred. Data will be collected throughout the 1972-1973 school year after the new building is completed, recording what changes if any take place and describing the direction of those changes.

Since the use of the open teaching and learning process affects both teachers and students, measures were developed for both. Also, teachers' attitudes about the process affects how they put it into practice. It follows that students' attitudes and behavior may differ depending on the degree of openness in their school and their teachers' attitudes towards the openness. Thus the measures for teachers include an interview to gain an understanding of their knowledge of and attitude towards open space as well as observations of what the teacher actually does in the classroom. The measures for students include a questionnaire regarding their general attitude towards school, a standardized test to rate their cognitive abilities, observations of what they actually do in the classroom, and a sociometric observation on interactions among students and between students and teachers. With these combined measures, attitudes will be related to behavior of both students and teachers and will, hopefully, be a description of a particular school in relation to the use of the open teaching and learning process.

Initially it was planned to collect demographic information so as to describe the socioeconomic status of the population in the four sample schools. The administrators of the District decided this was not feasible at this time so that aspect of the study had to be omitted. However, the schools will be described in terms of building size and design, number of students, and number of teachers.

This paper presents only the development of the instruments and the data collected at Fir Grove School. The comparison data for the longitudinal portion, as well as the data for the cross sectional portion will be collected during the 1972-1973 school year. The same instruments will be used for both components of the study and the data will be collected in a similar manner. At that time a final report will be written providing results and conclusions.

TEACHER'S INTERVIEW

Introduction

The data and discussion presented in this part of the report is the result of an interview administered to the teachers at Fir Grove School in the spring of 1972. The purpose of the interview was to collect base line data regarding the teachers' knowledge of and attitudes toward various aspects of open space theory before the new building was completed. It is projected that the interview will be given again in the spring of 1973 after nearly a year of teaching in the open space building to see if there is a change in attitudes towards the theory, and further to see if there is a discernable trend in that change.

Because of the limited time in which to collect the base line data, the interview schedule was of necessity short and the questions very general. The questions were designed to gather information on some of the indicators of the open teaching and learning process and some of the teaching methods used. Questions one and two asked about knowledge of and experience in open space. The next nine questions asked about attitudes toward small groups, team teaching, freedom of choice, individualized instruction, self-responsibility, anticipated problems, disciplining problems, staff relationships, and teaching in open space. The last question asked for any additional comments. It was hoped that knowledge of and experience in open space could be corrolated with attitudes. Since there is no specific definition of open space given in the literature, the intention was to find out how the teachers would define it. Therefore, no definition of open space was given in the interview schedule and the questions were phrased in

an open-ended form. It is anticipated that next year, the interview schedule will be refined based on the data we have gathered this year. (See recommendations following presentation of data.)

Also because of the time limit imposed on this initial phase of the study, it must be noted that the interviews were conducted the last week of the school year, during the time teachers were involved in packing for the move to the new building, and were preoccupied with the end of school and leaving for the summer.

Presentation of Data

The questions on the teachers' interview were all of the open-ended type and so the results will be presented in a discussion form. The interview was administered to all of the teachers at Fir Grove that were available and were going to be teaching there next year, including eighteen classroom teachers, two P. E. teachers, one music teacher, and one instructional aide, for a total of twenty-two interviews. The percentages given in the discussion for each question frequently total to more than 100% because many respondants gave more than one response.

Question 1: Have you had any training or done any reading in open space concepts?

In answer to question 1, it was found that 64% of those interviewed had done some reading (one or two articles and/or books) and 18% (or four people) had done extensive reading (several books and articles). Fifty-five percent mentioned they had observed open space schools in operation and 27% had talked with teachers now involved in open space. One person had had inservice training, one person had seen a movie explaining open space, and two people had had college classes dealing with this concept. Only one person answered that she had done no reading or had received no training.

Question 2: Have you had any previous experience teaching in open space schools?

The great majority of staff at Fir Grove indicated they had not taught in open space. Only three people or 13.5% were able to answer

"yes" to this question. Of those three, one had taught in open space as part of her training, one had taught in a special summer session, and one was currently teaching part time at another open space school within the District. Taking these first two questions together, it appears that the majority of teachers at Fir Grove are only moderately prepared for teaching in open space. Those people who have experienced teaching in open space are the same ones who have read extensively or had special training in the process. It appears the training session which the District has scheduled during the summer is well justified and timely.

Question 3: Learning can occur in both large groups and small groups.

a. What kind of learning takes place best in a large group?

b. What kind of learning takes place best in a small group?

This question was interpreted in two different ways, with "kind of learning" meaning subjects such as math or reading to some people and meaning method of presentation such as lectures or discussions to others. There were large numbers of differing ideas and few areas of agreement. Because of failure of this question to accurately define what it was asking, no conclusions can be drawn from it and it must be reworded before the interview is given a second time.

Question 4: Do you feel students benefit from team teaching?

The majority of teachers at Fir Grove seemed to feel that if the team were handled properly, students would derive benefits. Some were very positive about the results, but 50% of them added qualifications to their answers: one-fourth gave their opinion then added that they did not know for sure because they had not experienced team teaching;

another one-fourth gave their opinion that the benefits depended on the students and the team organization. There were only two negative answers, both with a different justification; one felt that inconsistencies between teachers lead to problems with students; the second felt that the dependent child needs the security of having only one teacher.

The reasons for positive answers to this question were very diverse. Thirty-six percent felt that with team teaching students were exposed to different approaches, personalities, talents, descipline and backgrounds, and thus were better prepared for the world outside the school. Because individual strengths and specialties of teachers were emphasized under team teaching, 32% of the respondents saw the possibility of more effective teaching and ultimately more effective learning by students. Eighteen percent, or four respondents, saw the opportunity by students to have more than one teacher as a very important resolution in the event of personality clashes between a particular student and teacher. It was felt by four people, or 18%, that teamed teachers would be able to use more small group instruction, both ability and interest groups, which in their opinion is an aid to learning. Another benefit to students, listed by three people, was the potential for more individualization which allows the student more freedom to learn at his own pace.

The fact that teachers would be in a better position to share ideas, knowledge and abilities, convinced three of the respondents that students would, in the end, benefit from team teaching. Reasons given by only one person included: the independent child benefits most; team teaching keeps teachers on their toes, and team teaching is good for choral groups because you can split up the parts and work separately with them.

Question 5: Do you feel students benefit from having a choice in what they are to do and when they are to do it?

An unqualified "yes" was given in answer to this question by 50% of the people. Three reasons for this answer were encouraging students to make choices which creates more interest, involvement, and motivation; making choices teaches students responsibility and decision making, and some students learn faster than others and thus need this freedom of choice.

The other 50% of the answers were also "yes", but with definite qualifications. Three people felt that there was a difference in the amount of choices which could be handled by each grade, with a gradual increase in the number of choices from the younger to the older grades. Two teachers felt that at times students benefited from a choice, but they basically need and like direction. Two people saw the need for both direction and freedom of choice. One answer indicated choice was good if it included guidelines. One felt that a child needed to make choices, but a pre-decided number of them. Two answers indicated that only a small percentage of children could handle a lot of choices. One person answered that children should be able to choose when to do their work, but they need direction in what to do. It appears that all the teachers feel choice is of benefit to students, it is only the degree and the timing of the choice that is in question.

Question 6: Do you think open space will allow for more individualized instruction?

In answer to this question there was a clear majority of agreement. Sixty-seven percent answered "yes", but half of these were qualified with

such comments as: if there are enough resources like aides, parent helpers, and materials; if open space brings teachers closer; and if time is scheduled properly. According to these answers, some of the things which will encourage individualized instruction are: 1) in open space it will be easier to use groupings, 2) there will be flexible use of space and people, 3) there will be team teaching, 4) the physical setting will create a warmer, closer atmosphere, 5) resources will be more convenient, and 6) it will be easier to use older students to tutor younger ones.

Three respondents were not sure if there would be more individualized instruction but added that they hoped it would. Three people were of the opinion that open space would make no difference in the amount of individualized instruction. One person felt there may be less of this kind of instruction because of team teaching.

Question 7: Do you think students will be encouraged to take more responsibility for their actions in the open space situation?

Once again there is a majority of "yes" answers but for several different reasons. Twenty-three percent answered this question by saying that the teachers plan to encourage reponsibility by setting up guidelines and goals; they will start with simple choices and work up to more complicated ones. Nine percent stated that the children will be allowed to develop their own rules which will then lead to greater self-responsibility. Eighteen percent felt that because of the open area, students will have to accept responsibility and consider others more so as not to disturb others. Nine percent thought that with so many people around each child will be better able to see what response his actions bring, thus increasing his sense of responsibility.

Eighteen percent answered "yes" because the new situation and flexibility of scheduling will give students more freedom of movement and freedom of choice from a wider variety of activities which will teach students to be more responsible. One person said "yes" because it will be easier for everyone to watch the students and such close supervision should result in encouraging responsibility for one's actions. Nine percent answered they did not know and nine percent said that students would not take more responsibility.

Question 8: What kind of problems do you anticipate will arise with open space?

The majority of people saw various elements of staff relationships as the largest problems, including: personality clashes, lack of communication and low morale (45% or ten people), scheduling (three people), conflicts over methods (two people), the adjustment from closed to open (two people); the increased visibility of teachers (two people); planning and coordination (two people); sharing supplies and cabinets (one person); loss of individuality (one person); lack of consistency (one person); and the slow process of teaming (one person).

Four people felt that distractions were going to be a problem for the students. Twenty-three percent or five people gave the opinion that noise would be a big problem, and to combat it some activities such as records and singing, would have to be curtailed. Movement of students was seen to be a potential problem by three teachers. Two others said that if there were inadequate aides and materials it could be a problem. One teacher felt that hyperactive children would pose special problems in open space. One teacher raised the question of where to hang things when there were no walls. Two people answered "I don't know" to the question, and two people anticipated no problems.

Question 9: Would you expect more discipline problems to occur in a closed or open classroom? Why?

One-half of the respondents felt that there would be no difference in the occurrence of discipline problems whether a classroom is open or closed. Three people expected more problems in a closed classroom, two of whom gave the reason that one teacher cannot discipline as well as several, as there will be in open space, and one gave the reason that in a closed classroom there is less opportunity for students to express themselves which leads to restlessness and discipline problems. Twenty-seven percent of the teachers expected that the open classroom would encounter more problems because of the visual and auditory distractions, because there will be a larger audience to perform for, because children need tighter rules and more direction rather than less, and because the problem child needs the security of the closed classroom. Three people thought there would be more discipline problems in the new portion of the school only until the students got used to the change.

Question 10: Do you feel staff relationships will change with open space? If so, how?

All but two of the replies to this question were positive.

Seventy-three percent felt the relationships would become closer with more sharing of ideas, more cooperation, communication, tolerance and flexibility. It was noted by 22.5% that the increased visibility of teachers would cause other members of the staff to see them responding professionally as teachers - not just people. One person mentioned the possibility of more social contact. Only one teacher answered that there would be no change in staff relationships. One did not know.

Question 11: In general, how do you feel about teaching in open space next year?

Most of the Fir Grove staff seemed positive about next year with a few admitting some reservations. Thirty-six percent of the teachers were excited and looking forward to the new experience. One of them stated she had originally been looking for a job in open space. Twenty-three percent felt that it was going to be very challenging. Two people held the belief that change is good and so felt the change to open space was good. One teacher said she felt great anticipation and one felt optimistic about it. Along with positive statements, two people said they felt a little scared and two said they felt a little apprehensive. One teacher said she was approaching the experience with caution. Thirty-six percent of those interviewed (first and second grade teachers) indicated they were not going to be in the new open space building, but would be in the old wing of the school. Two of these people wished they were in the open area; another was curious and would like to try it; and another mentioned a plan by the first and second grade teachers to attempt to convert the hall connecting the self-contained classrooms into an open area.

Question 12: Additional comments.

There were eighteen additional comments ranging from positive to negative with no two comments the same. They are as follows:

1. The only way to go.
2. Great to plan and work together.
3. It will help children.
4. Looks like it is workable depending on people in it.

5. I will reserve feeling until I am in it.
6. Open space must go with non-graded ability groups.
7. Will take a lot of close cooperation and consistency among staff.
8. Workshop will be important in staff relationships.
9. Organization is key to planning.
10. Makes more important the facilities for special subjects; P.E., music, etc.
11. Much planning will be necessary.
12. I would feel more comfortable with more planning in summer.
13. Teachers will have to be more accountable.
14. I wish the old wing were going to have carpets.
15. I wish teachers had been consulted more about building design and facilities.
16. We will have to be more structured - not as flexible time.
17. We will lose closeness and security of self-contained classrooms.
18. Teaming two grades will create more red tape.

Conclusions:

The fact that only three respondents had ever taught in open space leads to the conclusion that the majority of answers to this interview are based on theoretical or secondhand knowledge, not experiential. Even the amount of theoretical knowledge appears fairly limited, with only four people having done extensive reading. Keeping in mind that the answers are opinions, some further conclusions can be drawn.

Team teaching and students' freedom of choice, two aspects of the open space concept, is generally seen to benefit students. It is thought by most that the use of open space will encourage students to accept more responsibility for their actions. Half of the teachers saw disciplining of students to be no more difficult in open than closed classrooms. Straining of staff interpersonal relationships was the most frequent potential problem mentioned by the teachers. The cause of this concern may be due in part to existing conflicts within the school; however there was a very hopeful, positive feeling among the teachers that this situation would change with open space and teachers would become closer, as evidenced by all but three teachers indicating they were looking forward to next year. Considering the fact that the summer training session is focused primarily on staff relationships, it is not only well justified, but very appropriate. Although there were some reservations, most of the staff were very positive about the change to open space.

Knowledge of and experience in open space did not appear to correlate with attitudes towards the various aspects of open space. Of those who had experience, some were positive and some were neutral. The same held true for those without experience.

Recommendations:

Before the interview is again administered, it needs to be studied and changes implemented which are suggested by its first use. As stated previously, question 3 needs rewording to clarify what is being asked. Questions 1 and 2 could be made more objective by listing all the possible answers and asking the respondent to check all those that apply. Questions 4, 5, 6 and 7 could be worded in a way that is more neutral than the present form. Each question could be made into separate elements which would elicit more specific data. For instance, question 4 which asks about the area of team teaching could be broken down into a minimum of five separate elements of that area:

- Define team teaching
- What affect does team teaching have on teachers?
- What affect does team teaching have on students?
- How does team teaching affect scheduling?
- Are there any problems inherent in the concept of team teaching?

Another recommendation is that the interview be administered earlier in the spring to avoid the teachers' preoccupation with the ending of the school year and to ensure thorough data collection.

TEACHER OBSERVATIONS

The purpose of these observations was to determine what teachers actually do in their classes. Behavior was recorded on four variables: activity, the size of group teachers are working with, length of contact, and who initiates the contact. For each variable which formed a column on the coding sheet there were several possible measures. These are listed and defined in Table 1 on the following page. To see the multi-stage sampling design, the specific observational technique employed, and the training process of the observers, see appendix I.

Results

During the second week of May, 1972, ten teachers at Fir Grove were observed in order to gather base line data before the change to open space, and to gather data for planning the next year's observations. Table 2 lists in percentages the combined results of all the observations of behavior of teachers in the sample at Fir Grove School in terms of the four variables. The totals for Morning and Afternoon (time of day) are also given in Table 2. The analyses of variance[9] (see Table 16, appendix A) showed the variability between morning and afternoon to be significant.

As would be expected, the majority of a teacher's time is spent actually instructing children. It is interesting to note that teachers work with individual students and small groups more often in the morning, and work with large groups more often in the afternoon. The fact that students initiate contacts with teachers more often in the morning tends to corroborate this. The code "no contact"(x) usually goes with preparation, miscellaneous and watching; and since there is a slight

Table 1

DEFINITIONS FOR TEACHER OBSERVATIONS

Column I: Activity

I	Instruction: Actual Teaching
C	Friendly Interpersonal Contact & Counseling with students: talking about non-academic things, discussing personal problems, joking, etc.
D	Discipline: enforcing rules, mediating.
P	Preparation: preparing for teaching and student activities with anyone, correcting papers, handing out papers, custodial classroom duties, etc.
M	Miscellaneous: no observable behavior, personal conversations with other teachers, etc.
W	Watching: focus is on students but not actually in contact with them.

Column II: Grouping

1	One student
S	Small Group: 2-10 students
L	Large Group: over 10 students
L-1	One student within the context of a large group.
O	Other adult
X	No contact

Column III: Contact

+	Initial contact
-	Continuing Contact
*	Return to continuing contact after interruption

Column IV: Who Initiates

T	Teacher Initiated
S	Student Initiated

TABLE 2

TEACHER BEHAVIORS BY COMBINED TOTAL AND BY TIME OF DAY[10]

ALL VARIABLES

Variable	Combined Total Percentages	Morning Percentages	Afternoon Percentages
Activity			
I Instruction	63	64	61
C Counseling	6	7	5
D Discipline	5	5	6
P Preparation	13	13	14
M Miscellaneous	3	2	3
W Watching	9.5	8	11
X Out of Sight	.5	1	0
Grouping			
I Individual Student	33	39	26.5
S Small Group	18	23.5	11
L Large Group	24.5	18	32
L-1 One Student (in large grp)	8.5	6	12
O Other Adult	.5	.5	.5
X No Contact	15.5	13	18
Length of Contact			
+ New Contact	33	30	36
- Continuing Contact	63	65.5	59
* Return to Contact	4	4.5	5
Initiator			
T Teacher Initiated	32	26	40
S Student Initiated	68	74	60

rise in these three codes in the afternoon, no contact also is slightly higher. The length of contacts appears to average fairly short, between 45 seconds and one minute.

Although differences between grades are not significant, it can be seen there is some variation. Table 3 shows that the higher the grade level, the more often teachers work with large groups and individuals in preference to small groups. Also, teachers of first and second grades are in contact with students a higher percentage of time than teachers of the third through sixth grades. It may be that the older students are more able to function independently of the teacher. Table 3 also shows that students initiate more contact with the teacher in grades one, two, five and six than do students in grades three and four.

Recommendations:

The recommendation for next year is that the teachers' observations be used with the same codings and time intervals. However, it is important that these observations be taken simultaneously with the students' observations, thus giving a more accurate description of what is happening in the class. It is also recommended that the instructions a teacher gives to a class be recorded. The same sample of teachers will be continued next year.

TABLE 3

TEACHER OBSERVATION

TEACHER BEHAVIORS BY GRADE LEVEL GROUPING AND INITIATOR VARIABLES

Variable	Grades 1 & 2 Percentages	Grades 3 & 4 Percentages	Grades 5 & 6 Percentages
Grouping			
I Individual	30	33	35
S Small Group	25	20	12
L Large Group	19	23	30
L-1 One Student in Large Group	17	6	7
O Other Adult	0	1	0
X No Contact	10	17	16
Initiator			
T Teacher	25	44	24
S Student	75	56	76

STUDENT OBSERVATIONS

The purpose of these observations was to determine what students actually do in class. Behavior was recorded on five variables: movement, activity, amount of choice in the activity, grouping, and verbal contact. For each variable which formed a column on the coding sheet there were several possible measures. These are listed and defined in Table 4 on the following page. To see the multi-stage sampling design, the specific observational technique employed, and the training process of the observers, see appendix B.

Results:

During the first week of May, 1972, students at Fir Grove School were observed in order to gather base line data before the change to open space, and to gather data for planning next year's observations. Table 5 lists in percentages the combined results of all the observations of student behaviors at Fir Grove School during this one week period. The major variability was consistently found to be among individual students (see Table 17 appendix B for the estimated variance components). However, there were some instances where variability was found among time of day, teachers, or grades. The period of the day seemed to have random variation within teachers; no one period was more important than another.

TABLE 4

DEFINITIONS FOR STUDENT OBSERVATIONS

Column I: Movement

✓	In Desk: working at desk or standing beside desk
A	Working away from desk: taking the work they would be doing at their desk and doing it at another desk or table
T	Moving to teacher
S	Moving to another student or group of students
R	Moving to use references: includes books, tapes, records, other such equipment
F	Moving to use facilities: includes pencil sharpener, waste basket, sink, supplies
Tr	In Transition: moving to an unknown destination, miscellaneous
X	Out of sight: out of room or unable to locate. If this column is coded X, ignore columns 2-5 for this child for this 2 minute time sample.

Column II: Activity

R	Reading: includes SRA, pleasure books, reading tests
Sp	Spelling: includes studying spelling, taking spelling tests, practicing spelling with other children, writing spelling words, writing sentences using those words
M	Math: work books, work sheets, flash cards, taking a test
LA	Language Arts: creative writing, grammar
S	Science: films, reading texts, experiments, MACOS, discussions
SS	Social Science: maps, geography, cultures
O	Other: other scholastic subjects such as art, music, exercises, listening to stories
X	Non-Scholastic Activities: goofing off, dreaming, fooling around with other kids, pushing or shoving, giggling, talking about non-school things. If X is used, skip columns 3 and 4.

Column III: Amount of Choice

TD	Teacher Directed: explicit directions by the teacher which does not allow the child a choice
SD	Student Directed: situation in which the child has a choice of activities within a subject
SD2	Student Directed: situation in which the child has a choice between subjects

Column IV: Groupings

I	Individual
D	Dyad: includes only 2 students - not student/teacher
S	Small Group: 3-10 students physically in a group, separated in some way from the rest of the class. Must be some kind of groupness or interaction, not necessarily continual
L	Large Group: over 10 or whole class with attention focused on common center

Table 4 - continued

Column V: Verbal Contact

T	Primary Classroom Teacher
T1	Other teachers, number in order of contact (e.g. T1, T2, T3) Also included are principals, librarians, counselors, etc.
A	Aide: if more than one, subscript numerically
B1	First boy contacted (does not matter who initiates contact or whether listening or talking)
B2	Second boy contacted
B3	Third boy contacted
G1	First girl contacted
G2	Second girl contacted
G3	Third girl contacted
0	Contact with more than one child, includes talking or listening to small group or talking to large group

TABLE 5

STUDENT BEHAVIORS BY COMBINED TOTAL

ALL VARIABLES

Variable	Percentages
Movement:	
√ In Desk	73
A Working Away From Desk	14
T Teacher	2.5
S Student	.02
R Reference	.01
F Facility	.02
TR Transition	.01
X Out of Sight	4.5
Activity:	
S All-School Related	84
X Non-School Related	16
Choice:	
TD Teacher Directed	69
SD Student Directed (within subject)	11
SD Student Directed (between subject)	20
Grouping:	
I Individual	49
S Small Group	16
L Large Group	35
Verbal Contact:	
T Teacher	17
A Aide	0
B Boys	26
G Girls	37
O Group	20

The movement of children in the classroom tended to vary the most among classes which are indicated by teacher number (see Tables 6 and 7). The number of times students were observed working at their desks was highest for teacher 21, and lowest for teacher 43. The grade totals indicate that more movement by students is allowed in the fifth and sixth grades than in the third and fourth grades. It is interesting to note the use of references is practically non-existent except in the class of teacher 22.

The amount of choice a student has in which activity he works on as well as the amount of time he spends on non-scholastic activities varies among classes. Tables 8 and 9 indicate that although the grade totals are similar there is a great deal of variation among classes within each grade. For example, while teacher 23 divides the students' time fairly evenly between teacher directed activity and the two levels of student choice of activity, teacher 28 directs students 80% of the time, allows students to choose activities within the subject 14% of the time, and allows students a choice betwen subjects only 6% of the time. Interestingly, the non-school related activities for these two classes only vary by 2%. This may indicate that the amount of non-school related activity by students is not a function of how much freedom they experience. Table 9 shows a greater variation among classes on the non-school related category, but once again it does not seem to be related to the amount of choice students are allowed.

TABLE 6

STUDENT BEHAVIORS OF GRADES 3 AND 4

MOVEMENT VARIABLE

Variable	% for Class 21	% for Class 22	% for Class 23	% for Class 28	Total % for Grades 3-4
V+A In Desk	97	88	87	88	90
T Teacher	1.5	2	2	2	2
S Student	.5	1	3	3	2
R Reference	0	3	0	1	1
F Facility	1	4	2	1	2
TR Transition	0	1	1	2	1
X Out of Sight	0	1	5	3	2

TABLE 7

STUDENT BEHAVIORS OF GRADES 5 AND 6

MOVEMENT VARIABLE

Variable	% for Class 41	% for Class 42	% for Class 43	% for Class 44	Total % for Grades 5-6
In Desk V+A	91	84	74	90	85
Teacher T	2	2	6	3	3.5
Student S	1	0	3	1	1
Reference R	1	0	0	0	0
Facility F	0	3	3	0	1.5
Transition TR	1	1	1	1	1
Out of Sight X	4	10	13	5	8

TABLE 8

STUDENT BEHAVIORS OF GRADES 3 AND 4

CHOICE AND ACTIVITY VARIABLES

		% for Class 21	% for Class 22	% for Class 23	% for Class 28	Total % for Grades 3-4
Choice Variable						
TD	Teacher Directed	74	59	31	80	61
SD_1	Student Directed.1	0	33	32	14	20
SD_2	Student Directed.2	26	8	37	6	19
Activity Variable						
S	All School Related	87	86	84	82	85
X	Non-School Related	13	14	16	18	15

TABLE 9

STUDENT BEHAVIORS FOR GRADES 5 AND 6

CHOICE AND ACTIVITY VARIABLES

		% for Class 41	% for Class 42	% for Class 43	% for Class 44	Total % for Grades 5-6
Choice Variable						
TD	Teacher Directed	90	61	51	74	70
SD_1	Student Directed.1	0	5	7	18	7
SD_2	Student Directed.2	10	34	42	8	23
Activity Variable						
S	All School Related	95	89	81	64	82
X	Non-School Related	5	11	19	36	18

Table 10 shows the percent of times students were working individually, in small groups and in large groups. A clear relationship can be seen between the grade level and the use of small and large groups, e.g., the higher the grade level, the more small groups are used and the less large groups are used. This finding seems to conflict with the previous finding that teachers work less often with small groups at the higher grade levels. However, it may be accounted for by the probability that the older the students are, the more likely they are to function in a small group without the teachers' help. Thus, the first and second grade teachers may spend more time working with small groups, but independently functioning small groups may be used more frequently at the higher grade levels. Thus a teacher at the higher grade level is freer to work with individuals. These percentages did not vary much among teachers within the grade level.

Verbal contact is presented in Tables 11 and 12. Frequency totals were included along with percents in order to show that more verbal contact was observed in the fifth and sixth grades than in the third and fourth grades. Frequencies for first and second grades were not included because there were fewer observations taken and a comparison would be invalid. Also it appears that there is more talking in the afternoon than there is in the morning. The percentages show that third and fourth graders talk to their teacher at least twice as much as students in other grades. Also, girls talk more with each other than boys, particularly in the higher grades. Students talk to groups more often in the fifth and sixth grades than in lower grades, which supports the earlier finding that more groups are used in the higher grades.

TABLE 10

STUDENT BEHAVIORS BY GRADE LEVEL

GROUPING VARIABLE

		% for Grades 1-2	% for Grades 3-4	% for Grades 5-6
Grouping Column				
I	Individual	51	57	39
S	Small Group	6	10	29
L	Large Group	43	33	32

TABLE 11

STUDENT BEHAVIORS BY GRADE LEVEL

VERBAL CONTACT VARIABLE

			Grades 1-2	Grades 3-4		Grades 5-6	
			%	%	frequency	%	frequency
T	Teacher		13	26	65	11	38
A	Aide		0	0		0	
B	Boys		34	25	62	24	83
G	Girls		38	35	88	39	132
O	Group		15	14	36	26	89
		Total			251		342

TABLE 12

STUDENT BEHAVIORS BY TIME OF DAY

VERBAL CONTACT VARIABLE

			Morning		Afternoon	
			frequency	%	frequency	%
Teacher	T		50	16	68	17
Aide	A			0		0
Boys	B		85	27	99	25
Girls	G		121	39	142	36
Group	O		58	18	84	22
		Total	314		393	

Recommendations

The major variability was found to be among students and classes, very little variability was found between periods or time of day. Therefore, it is recommended that the emphasis next year be placed on observing more students and less emphasis be placed on time of day. Once again it is important that the observations of teachers and students be taken simultaneously to give a better description of what is actually happening in the class.

RECESS OBSERVATIONS

Introduction

The purpose of the recess observation was to measure the sociability patterns of students outside the classroom. According to open space theory students would be expected to interact more often with students from other classes as well as interact with more adults. Unfortunately it was not possible for observers to determine which children were from other classes on a crowded playground. What was done was to follow a child during the recess, recording what size of a group he was in and who he had verbal contact with. Appendix C gives the details on the sampling procedure.

Results

There was not much variability among classes or between time of day. Table 13 presents percentages by grades. The major variability seemed to be between small and large groups: grades one and two were more often observed in small groups while grades three through six were more often observed in large groups. Contact with adults was minimal but increased as the grade increased. It was the impression of the observers that the majority of students spent the entire recess period involved in groups playing organized games such as four square, baseball, etc. The games the younger children tended to play required smaller groups than the games the older children played.

Because of the difficulty in obtaining meaningful data and the difficulty in maintaining the sample size, this portion of the study will not be used next year.

TABLE 13

STUDENT RECESS BEHAVIORS BY GRADE LEVEL

	% Grades 1 & 2	% Grades 3 & 4	% Grades 5 & 6
Grouping			
I Individual	8	5	10
D Dyad	14	15	7
S Small Group	58	21	20
L Large Group	20	57	45
X Out of Sight	0	2	18
Verbal Contact			
T Teacher	0	1	5
A Aides	0	0	0
B&G Boys or Girls	67	53	65
O Group	33	46	30

STUDENT QUESTIONNAIRE

Introduction

A questionnaire was administered to students at Fir Grove School in May, 1972 for two purposes: (1) development of the questionnaire, and (2) collecting base line data on students' general attitude towards school. Two questionnaires of different length and complexity were used: the longer and more complex one for students in the third through sixth grades, and a simpler version for students in the first and second grades. The two questionnaires were necessary because of the difference in reading and comprehension abilities of students at different grade levels.

Questionnaire for Third Through Sixth Grades

The questionnaire was modeled after the Learning Environment Inventory (LEI)[11], presenting statements with a choice of agreement on a five point scale. See appendix E for a sample questionnaire. The statements are based on expectations drawn from open space theory and cover general attitude toward learning, school environment, autonomy, and sociability. Statements 1, 6, 7, 10, 12, 14 and 20 are modified versions of statements from LEI. The rest were developed specifically for the open space study. The questionnaire was given to the entire population of students in grades three through six at Fir Grove, one class at a time, by a research assistant.

Results:

In order to interpret the questions more easily, the questions were grouped together by a statistical procedure called "Factor Analysis"[12]. The factor analysis showed four distinct groups of questions or factors which appeared to have the following themes: 1) General Satisfaction With School, 2) Autonomy, 3) Work Atmosphere, and 4) Sociability. Statements 6, 16 and 21 did not correlate with any of the four factors and so were dropped from

the analysis. Every statement had a full range of responses from one (Disagree A Lot) to five (Agree A Lot). Table 14 presents the statements that comprise each factor and the percent of response to the five alternatives for each statement. The average response is presented in Table 15; it appears to be fairly positive.

The mean factor scores[13] by class and an analysis of variance of these means is presented in Tables 18 and 19, appendix D. Although none of the sources of variability were large enough to be significant, there was some variability among classes.

This questionnaire, with the exception of the three statements dropped from the analysis, will be used next year to determine if students' attitudes change after the switch to open space.

Questionnaire for Grades One and Two

The questionnaire for the younger grades comprised ten statements taken from the questionnaire of the older grades. The responses to be marked by the children were five faces ranging from a full frown to a full smile with the middle face indicating no expression. The faces were used to represent degrees of agreement with each statement.[14] See appendix E for sample questionaire.

There was a difference of opinion among people who regularly worked with this age of child as to the administration of the questionnaire: some thought it needed to be administered individually and some thought a small group administration would be effective. Administration to the entire class at one time was ruled out because of the likelihood some children would not understand what was being asked of them and would escape notice, thus the data would not be accurate.

TABLE 14

STUDENT QUESTIONNAIRE GRADES 3-6

FACTORS AND PERCENT OF RESPONSE

Factor Loadings					% of Response				
	I	II	III	IV		Agree A Lot	Agree A Little	Not Sure	Disagree A Little	Disagree A Lot
					I GENERAL SATISFACTION WITH SCHOOL					
.	-.57	.01	.14	.22	I would be proud to show my school to a visitor.	57	19	15	2	5
.	-.71	.09	-.06	.23	I like my teachers.	74	9	6	2	6
.	-.66	.14	-.16	-.10	I like to come to school.	43	18	13	7	17
.	-.55	.01	-.02	-.22	My teachers know what I am doing in my class.	50	20	21	3	4
.	-.67	.02	.02	-.21	I like to learn new things.	71	12	6	4	4
).	-.51	.05	-.13	-.33	Our school is bright and cheerful.	32	23	20	10	13
.	-.55	-.10	.10	-.26	My teachers know how well I am doing in my classwork.	73	10	10	2	3
5.	-.57	-.23	.15	.22	Sometimes I wish my class weren't so noisy.	55	14	9	7	14
					II AUTONOMY					
2.	-.15	.44	.46	-.18	I can often choose what work I want to do.	19	26	20	20	14
7.	-.35	-.48	.22	-.06	There are many rules I have to obey in my class.	54	20	9	8	7
5.	.22	-.59	.21	-.13	My teachers usually need to tell me to do my work.	14	18	10	23	32
8.	-.17	-.53	-.19	-.08	Everyone works on the same things in my class.	13	20	15	22	28
4.	.07	-.72	.04	.06	My teachers always tell me what to do.	19	15	12	21	31
					III WORK ATMOSPHERE					
2.	-.15	.44	.46	.18	I can often choose what work I want to do.	19	26	20	20	14
3.	.24	-.31	.52	-.12	I often think about many other things instead of doing my work.	27	24	11	15	21
0.	.08	-.00	.59	.09	Our class is too crowded.	10	8	13	9	58
3.	-.27	-.02	.57	.07	I like having a place in school to go where I can work alone.	53	19	10	7	9
					IV SOCIABILITY					
4.	-.22	.08	.06	-.49	I am friends with a lot of children in other classes.	58	20	8	4	9
.1.	-.26	-.08	.20	-.55	My class has students who like to do many different things.	66	16	12	1	2
2.	-.28	.01	-.07	-.60	There is enough room for both individual and group work.	50	18	18	4	8
3.	-.30	-.09	-.10	-.64	I like to work with other children.	62	17	8	3	6
.4.	-.33	-.13	-.23	-.48	Children in one class like each other as friends.	45	22	17	6	7
.9.	.10	-.03	-.01	-.60	I often work with other children in small groups.	34	20	13	14	17

TABLE 15

STUDENT QUESTIONNAIRE GRADES 3-6

AVERAGE RESPONSE

FACTOR I		FACTOR II	
Statement	Average	Statement	Average
1	4.1880	2	3.1367
5	4.4102	7	4.0512
8	3.6296	15	2.5840
9	4.0655	18	3.5099
17	4.4074	24	2.6923
20	3.5099		
22	4.4729		
25	3.8917		

FACTOR III		FACTOR IV	
Statement	Average	Statement	Average
2	3.1367	4	4.1196
3	3.2022	11	4.4159
10	2.0341	12	3.9715
23	3.9829	13	4.2478
		14	3.8974
		19	3.4017

Also, in a large group chances were high that some children would influence others by saying out loud what they had answered. It was decided to take a sample of eight children per class, four to be administered individually and four to be administered in a small group. The results could then be compared to see which was more effective. The expectation is that the variability would be greater among the individually administered than the group administered.

Results

The factor analysis showed no clearly defined factors and very little correlation among the statements. Children apparently could not understand the statements well enough or could not distinguish between answers. They seemed to be answering randomly with a great tendency towards choosing happy faces. Every statement had a majority of positive answers with a few negative ones, which didn't follow any pattern.

The results of the t test and f test comparing the two types of administration showed there were no significant differences between how students responded. It is doubtful that this is due to the administration so much as it is due to the questionnaire which does not differentiate between anything.

ACHIEVEMENT TESTS

In order to measure the cognitive achievement of students, the California Test of Basic Skills, a standard achievement test normally used by the District, was administered to a random sample of classes at Fir Grove School during May, 1972. The class means are presented in Table 16. This same test will be administered again next spring to classes at Fir Grove School after the change to open space so that a longitudinal comparison may be made.

TABLE 16

ACHIEVEMENT TESTS BY CLASSES

	3	3	3	4	4	5	5	5	6	6	6	6
Reading Vocabulary	4.57	4.26	4.16	4.91	5.19	7.07	7.08	6.73	7.25	7.47	8.29	8.05
Reading Comprehension	5.03	4.63	4.91	5.66	6.05	7.24	7.27	8.13	7.85	7.80	9.21	8.93
Reading Totals	4.77	4.52	4.45	5.15	5.57	7.13	7.12	7.38	7.57	7.60	8.73	8.48
Language Mechanics	4.69	4.61	3.77	5.40	5.19	6.32	6.76	6.65	6.05	6.73	8.47	9.00
Language Expression	4.86	4.94	4.24	5.23	5.95	7.00	7.05	7.49	7.49	7.92	9.63	8.91
Language Spelling	4.00	4.66	3.87	4.71	4.96	6.57	6.15	6.71	6.57	6.84	7.45	7.91
Language Total	4.33	4.66	3.86	4.96	5.28	6.57	6.55	6.99	6.86	7.01	8.51	8.55
Arithmetic Computation	4.51	4.51	3.66	4.76	4.85	6.40	6.23	6.45	5.95	6.33	7.36	7.85
Arithmetic Concepts	3.93	4.36	4.09	5.13	5.85	6.61	6.79	6.77	7.17	6.93	7.64	8.51
Arithmetic Application	3.93	4.45	4.27	4.25	5.58	6.26	7.13	7.39	6.73	6.77	7.45	8.72
Arithmetic Totals	4.26	4.44	3.81	4.67	5.28	6.41	6.56	6.77	6.40	6.65	7.49	8.25
Battery Total	4.31	4.89	3.83	4.73	5.24	6.57	6.55	6.96	6.84	7.04	8.09	8.32
Reference	0	0	0	0	0	7.35	7.17	8.06	7.05	7.45	8.55	9.15
Study Skills Graphic	0	0	0	0	0	7.42	7.64	7.63	7.14	7.64	9.52	9.32
Total Study Skills	5.11	5.22	4.40	5.22	5.80	7.30	7.47	7.71	7.02	7.56	9.33	9.10

CONCLUSION

The purpose of this initial portion of the study on open space was twofold: 1) to gather the base line data at Fir Grove School for the longitudinal component of the study, and 2) to develop and test the instruments to be used throughout the study. The results have been presented and general trends pointed out, but conclusions regarding the use of the open teaching and learning process cannot be drawn until the rest of the study has been completed. It is important to point out that the use of this process is relative. There is no clear outline distinguishing closed schools from open schools. It is most clearly conceptualized as a continuum from closed to open, with each teacher placing at different points on the continuum for every variable.

The instruments which will be used next year include the following: Teachers Interview (modified), teacher observations, student observations (modified), Student Questionnaire Grades 3-6, and student achievement tests.

APPENDIX A

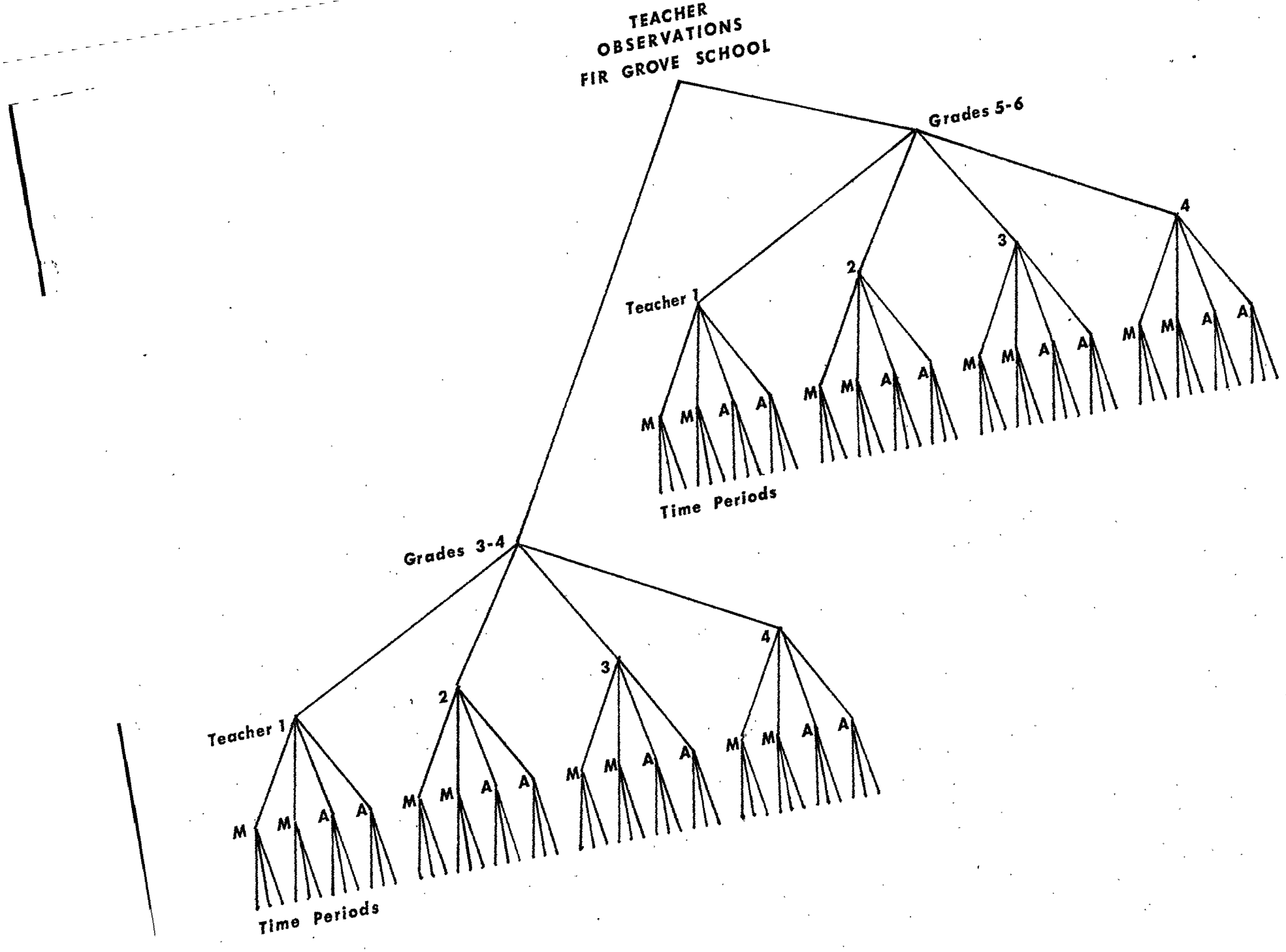
SAMPLING DESIGN OF TEACHER OBSERVATIONS

A multi-stage sampling procedure was employed in which teachers were selected at random, time of day (two mornings and two afternoons) was stratified within teachers, and periods (3) were chosen at random within time of day (see figure #3). In order to have a large enough number of teachers to ensure random choice, grades three and four, and grades five and six were pooled. Four teachers were selected from each pooled group. Although it was not planned to include the first and second grades as an intricate part of the study, two teachers were selected from the pooled first and second grades because of a request from these teachers at Fir Grove School that they be included.

OBSERVATION TECHNIQUE AND TRAINING OF OBSERVERS

Teachers were "instantaneously" observed and codes recorded in each of the four columns every fifteen seconds for the five minute time period. A sample of the coding form is on the following page.

Eight observers were carefully and specifically trained in the use of the observational system. After becoming familiar with the definition codes, and coding forms, they practiced by all observing video tapes of classrooms and recording at the same time. The results were compared and discussed so that differing interpretations of the definitions could be viewed and ironed out. This process was continued until agreement of 80% or better in recording behavior was reached.


TEACHER
OBSERVATIONS
FIR GROVE SCHOOL
Grades 5-6
Teacher 1
2
3
4
M
M
A
A
Time Periods
Grades 3-4
Teacher 1
2
3
4
M
M
A
A
Time Periods

TEACHER OBSERVATION CODING FORM

:her_____ Grade_____

_____ P.M._____ Date_____ Observer_____

TIME						TIME						TIME					
	15 SEC	1	2	3	4	MIN	15 SEC	1	2	3	4	MIN	15 SEC	1	2	3	4
	1					1	1					1	1				
	2						2						2				
	3						3						3				
	4						4						4				
	1					2	1					2	1				
	2						2						2				
	3						3						3				
	4						4						4				
	1					3	1					3	1				
	2						2						2				
	3						3						3				
	4						4						4				
	1					4	1					4	1				
	2						2						2				
	3						3						3				
	4						4						4				
	1					5	1					5	1				
	2						2						2				
	3						3						3				
	4						4						4				

TABLE 17

TEACHER OBSERVATIONS

ANALYSIS OF VARIANCE

	INSTRUCTION			
Source	D.F.**	SS**	MS**	F**
Grade	2	366.4284	183.2142	.04
Teacher	7	35982.6876	5140.3838	1.36
Time of Day	10	37747.4454	3774.7441	17.85*
Period	207	43781.0079	211.5024	
	DISCIPLINE			
Source	D.F.	SS	MS	F
Grade	2	7.4682	3.7341	.09
Teacher	7	281.1193	40.1599	1.37
Time of Day	10	293.9332	29.3933	7.02*
Period	207	867.0001	4.1884	
	PREPARATION			
Source	D.F.	SS	MS	F
Grade	2	17.6690	8.8345	.00
Teacher	7	1820.1481	260.0211	1.15
Time of Day	10	2254.7822	225.4781	9.56*
Period	207	4882.0009	23.5845	
	INDIVIDUAL			
Source	D.F.	SS	MS	F
Grade	2	24.4304	12.2151	.00
Teacher	7	10733.7656	1533.3950	1.29
Time of Day	10	11857.3281	1185.7326	12.70*
Period	207	19320.0039	93.3333	

Table 17 - continued

SMALL GROUP

Source	D.F.	SS	MS	F
Grade	2	228.0897	114.0448	.19
Teacher	7	4106.7988	586.6854	.93
Time of Day	10	6318.2129	631.8212	11.86*
Period	207	11024.0019	53.2560	

Source	D.F.	SS	MS	F
Grade	2	122.8280	61.4140	.06
Teacher	7	7574.0927	1082.0131	1.36
Time of Day	10	7933.5966	793.3596	15.28*
Period	207	10750.0019	51.9323	

Source	D.F.	SS	MS	F
Grade	2	252.4932	126.2466	.21
Teacher	7	4187.1718	598.1673	1.18
Time of Day	10	5075.9980	507.5997	12.13*
Period	207	8662.0019	41.8454	

These tables are read from the bottom to the top; each term includes the term below.

* this term is significant

**

D.F. - Degrees of Freedom

MS - Mean of Squares

SS - Sum of Squares

F - F Test

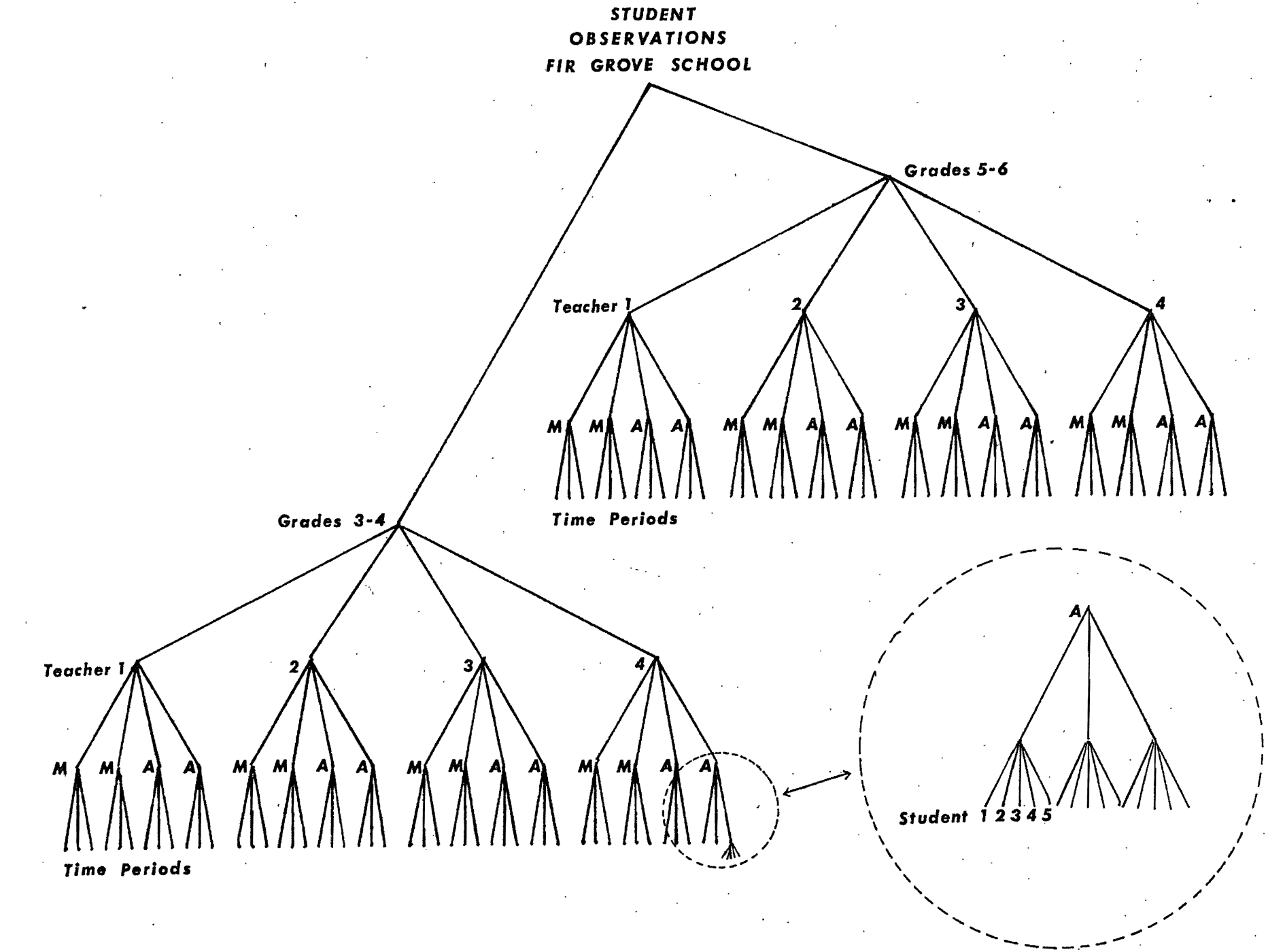
APPENDIX B

SAMPLING DESIGN OF STUDENT OBSERVATIONS

A multi-stage sampling procedure was used in which teachers were selected at random (the same ones chosen for teacher observation), time of day (morning and afternoon) was stratified within teachers, periods were chosen at random within time of day, and students were chosen randomly within periods. (see figure 4)

OBSERVATION TECHNIQUE

The observation was done with a scanning technique. At the beginning of a two minute time interval, child number one was observed and a code placed in each of the five columns. Then child number two was observed, then numbers three, four and five. At the beginning of the next two minute interval the process was begun again. It was continued for five intervals until the ten minute time period was complete. A sample coding form is on the next page. There were three time periods within every morning and afternoon (time of day), and there were two mornings and two afternoons, randomly selected throughout the days of the week, for each teacher. Training of the observers was the same process used for teacher observations.

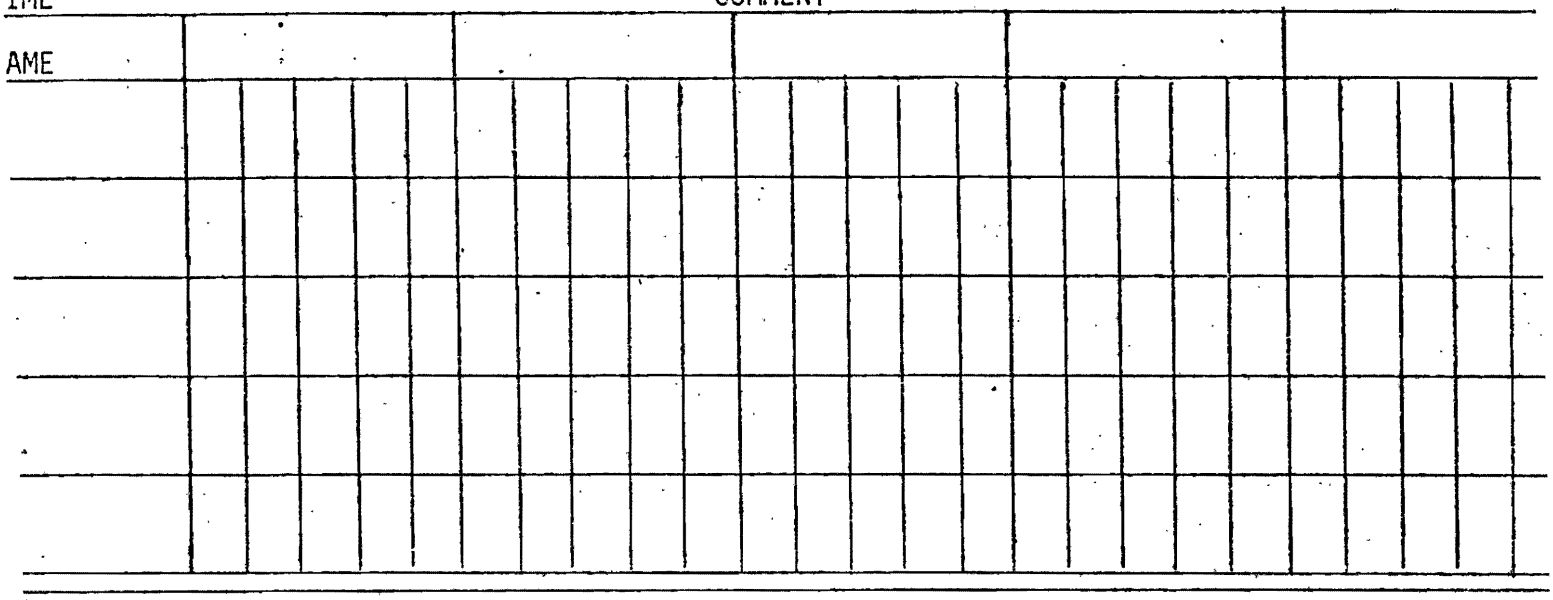

STUDENT
OBSERVATIONS
FIR GROVE SCHOOL
Grades 5-6
Teacher 1
2
3
4
M M A A
Time Periods
Grades 3-4
Teacher 1
2
3
4
M M A A
Time Periods
A
Student 1 2 3 4 5

TEACHER _____ GRADE _____

M_____ PM_____ DAY _____ OBSERVER _____

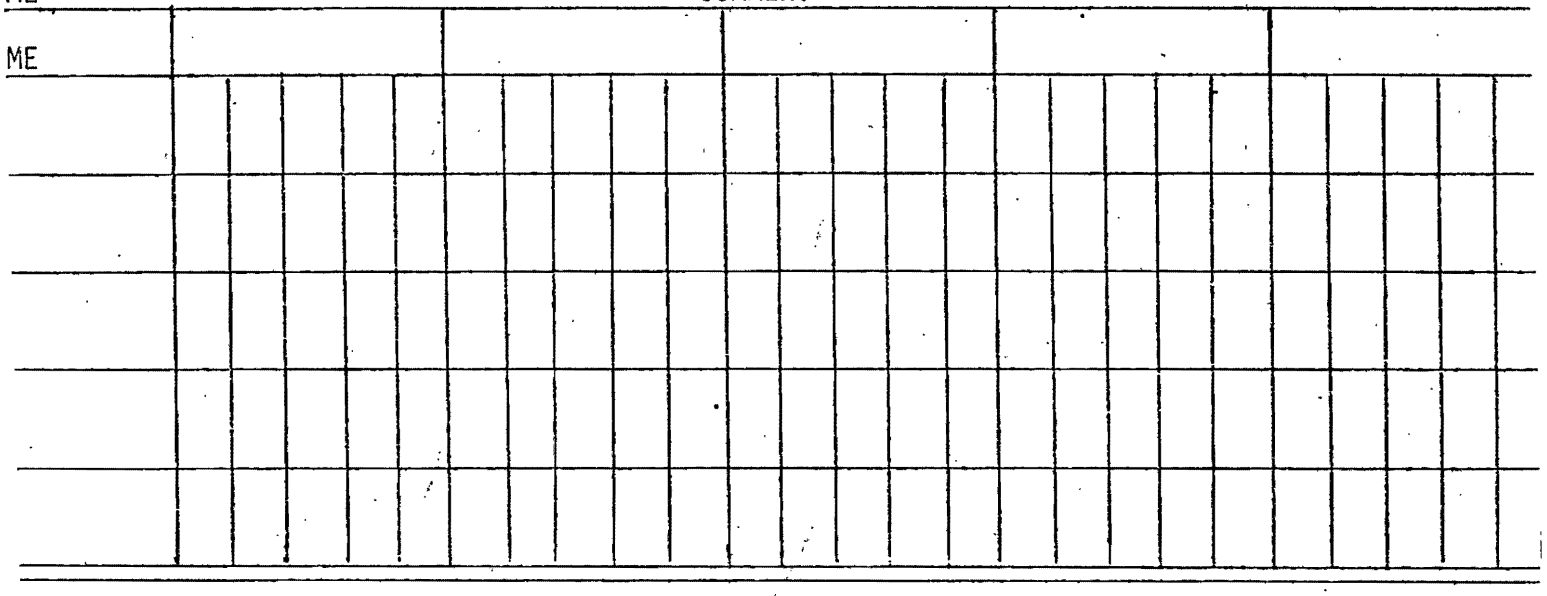
IME COMMENT

AME



ME COMMENT

ME



1E COMMENT

1E

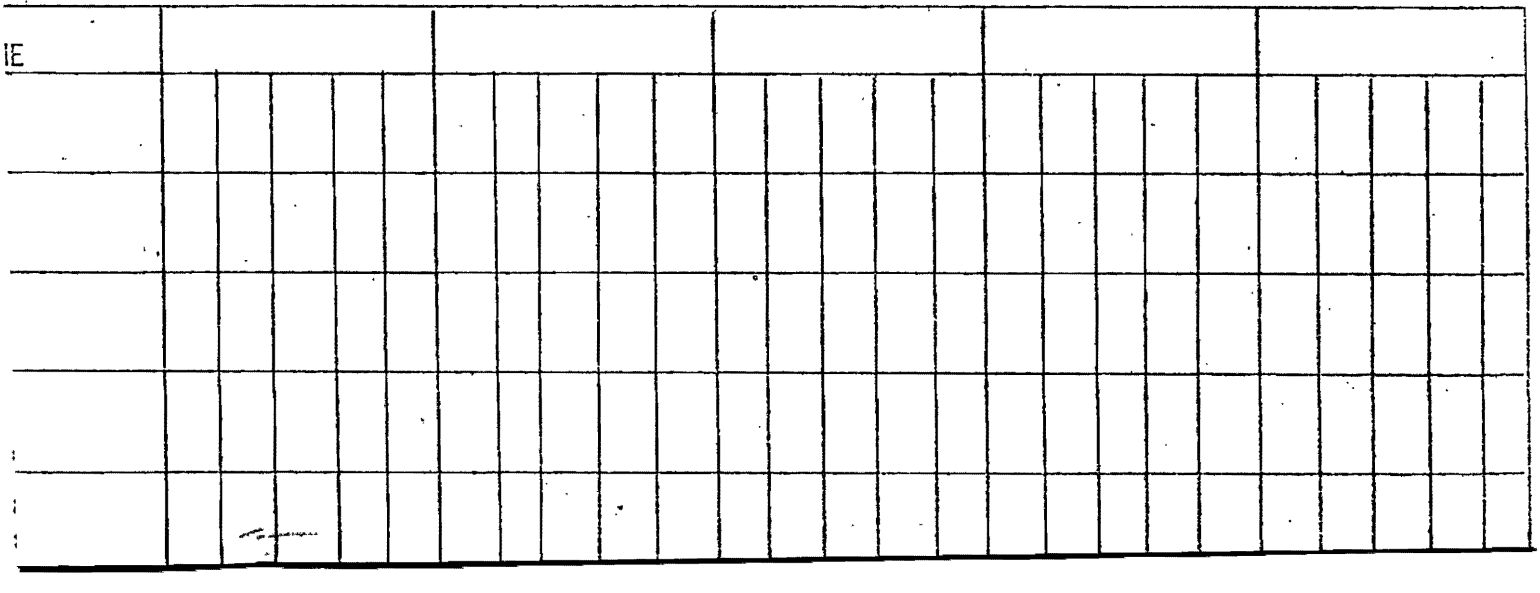


TABLE 18

STUDENT OBSERVATIONS

ANALYSIS OF VARIANCE

Source	D.F.**	SS**	MS**	F**
SMALL GROUP				
Grade	2	0.5127	0.2563	1.41
Teacher	7	1.2737	0.1819	3.13*
Time of Day	10	2.4763	0.2476	4.26*
Period	40	2.3266	0.0581	1.18
Student	515	25.4000	0.0493	
INDIVIDUAL				
Grade	2	101.5976	50.7988	3.09
Teacher	7	115.0034	16.4290	2.38*
Time of Day	10	267.8594	26.7859	3.88*
Period	40	276.3682	6.9092	2.59*
Student	515	1374.6081	2.6691	
NON-SCHOLASTIC				
Grade	2	3.5925	1.7962	
Teacher	7	74.3053	10.6150	1.99
Time of Day	10	53.4040	5.3404	2.59*
Period	40	82.5262	2.0631	1.96*
Student	515	543.1007	1.0545	
TEACHER DIRECTED				
Grade	2	83.5083	41.7541	
Teacher	7	329.8106	47.1157	5.26*
Time of Day	10	191.0947	19.1094	2.14*
Period	40	357.8975	8.9474	3.01*
Student	515	1528.1135	2.9672	

Table 18 - continued

Source	D.F.**	SS**	MS**	F**
		IN DESK		
Grade	1	55.1509	55.1509	2.19
Teacher	6	150.9756	25.1626	4.70*
Time of Day	8	73.2041	9.1505	1.71
Period	32	171.4062	5.3564	1.89
Student	422	1195.1037	2.8319	
		TEACHER		
Grade	1	1.5510	1.5510	4.53
Teacher	6	2.0553	.3425	1.31
Time of Day	8	4.9145	.6143	2.36
Period	32	8.3146	.2598	1.12
Student	422	97.5920	.2312	

These tables are read from the bottom to the top, each term includes the term below..

* this term is significant

**

D.F. - Degrees of Freedom

SS - Sum of Squares

MS - Mean of Squares

F - F Test

APPENDIX C

RECESS OBSERVATIONS

Recesses were fifteen minutes in length and an observation was made every thirty seconds. A sample of the coding form is on the following page. The sample consisted of child number one selected for the regular student observation. Thus the plan was to have one recess observation for every morning and afternoon for every teacher. Unfortunately, the sample turned out to be much smaller than planned because teachers frequently took advantage of an option not to have recess, particularly in the afternoons.

RECESS - CODING FORM

bserver_____ Date_____

AM

ıild's Name_____

ade_____

acher_____

me Period 1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

PM

Child's Name_____

Grade_____

Teacher_____

Time Period 1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

APPENDIX D

STUDENT QUESTIONNAIRES

TABLE 19

ANALYSIS OF VARIANCE

FACTOR I

Source	D.F.	SS	MS
Grade	1	4.2170	4.2170
Teacher	13	23.1585	1.7814
Students	335	207.4446	0.6192

FACTOR II

Source	D.F.	SS	MS
Grade	1	2.0601	2.0601
Teacher	13	36.1917	2.7839
Students	335	165.6967	0.4946

FACTOR III

Source	D.F.	SS	MS
Grade	1	2.4944	2.4944
Teacher	13	15.2667	1.1743
Students	335	156.4836	0.4671

FACTOR IV

Source	D.F.	SS	MS
Grade	1	4.2081	4.2081
Teacher	13	20.5196	1.5784
Students	335	171.5396	0.5120

TABLE 20

MEAN FACTOR SCORES FOR EACH CLASS

	Factor I	Factor II	Factor IV	Factor V
Teacher	General Satisfaction	Autonomy	Work Atmosphere	Sociability
21	.0124	.2273	.1160	-.1827
22	.3967	.3767	-.2292	-.4133
23	.2087	.6700	.1702	.1417
24	.2732	-.0950	-.2782	-.4673
25	.2214	-.0364	-.0153	-.3746
26	.0003	-.4787	-.2992	.2940
27	-.2617	.1509	.1346	-.0901
28	.2897	.0856	-.2670	.0869
41	.1322	-.1064	.3133	.3320
42	.0796	-.1537	.0872	.3928
43	-.4011	-.1325	-.1839	-.0494
44	-.1335	-.2623	.4557	-.0404
45	.3733	.5780	-.1792	-.1007
46	-.1835	-.5909	.0418	.3995
47	-.5684	-.1620	-.0057	-.0835

APPENDIX E

Teacher Interview Form

Student Questionnaire, Grades 3-6

Student Questionnaire, Grades 1-2

FIR GROVE TEACHER INTERVIEW

1. Have you had any training or done any reading in open space concepts? (Interviewer get specifics)

2. Have you had any previous experience teaching in open space schools?

3. Learning can occur in both large groups and small groups.
   a. What kind of learning takes place best in a large group?

   b. What kind of learning takes place best in a small group?

4. Do you feel students benefit from team teaching? Why?

5. Do you feel students benefit from having a choice in what they are to do and when they are to do it?

6. Do you think open space will allow for more individualized instruction?

7. Do you think students will be encouraged to take more responsibility for their actions in the open space situation?

8. What kind of problems do you anticipate will arise with open space?

9. Would you expect more discipline problems to occur in a closed or open classroom? Why?

10. Do you feel staff relationships will change with open space? If so, how?

11. In general how do you feel about teaching in open space next year?

12. ADDITIONAL COMMENTS

NAME_____

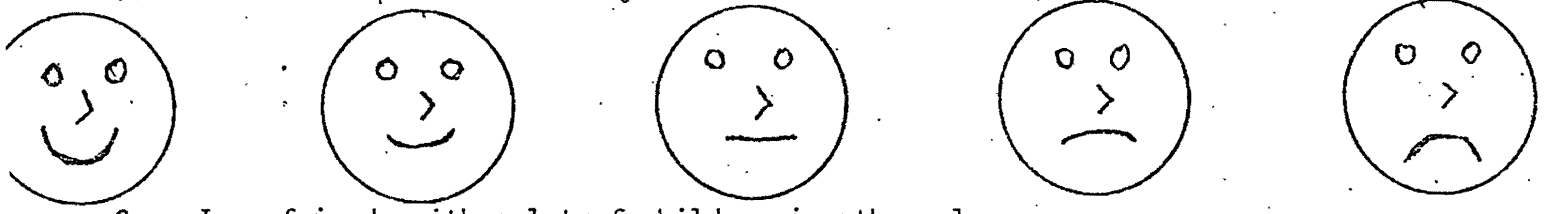
POSITION (teacher, librarian, etc.)_____

GRADE_____

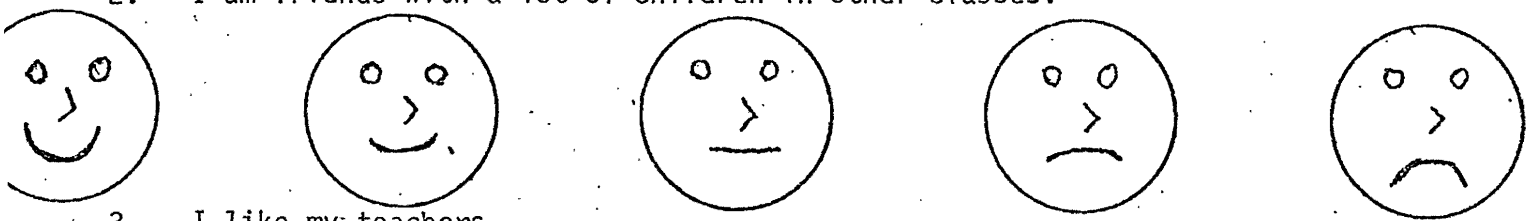
	ɟree a lot	ɟree a little bit	ɪt sure	lsagree a little bit	sagree a lot
I would be proud to show my school to a visitor.					
I can often choose what work I want to do.					
I often think about many other things instead of doing my school work.					
I am friends with a lot of children in other classes.					
I like my teachers.					
The books and equipment I need or want are easy to get at.					
There are many rules I have to obey in my class.					
I like to come to school.					
My teachers know what I am doing in my class.					
Our class is too crowded.					
My class has students who like to do many different things.					
There is enough room for both individual and group work.					
I like to work with other children.					
Children in our class like each other as friends.					
My teachers usually need to tell me to do my work.					
My teachers compare my work with work of other students.					
I like to learn new things.					
Everyone works on the same things in my class.					
I often work with other children in small groups.					
Our school is bright and cheerful.					
Some children do not have many friends.					
My teachers know how well I am doing in my classwork.					
I like having a place in school to go where I can work alone.					
My teachers always tell me what to do.					
Sometimes I wish my class weren't so noisy.					

GRADE 1 - 2 INTERVIEW

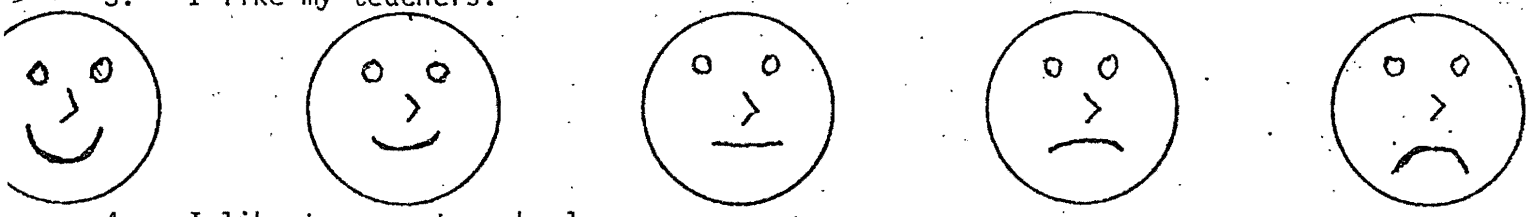
1. I would be proud to show my school to a visitor.



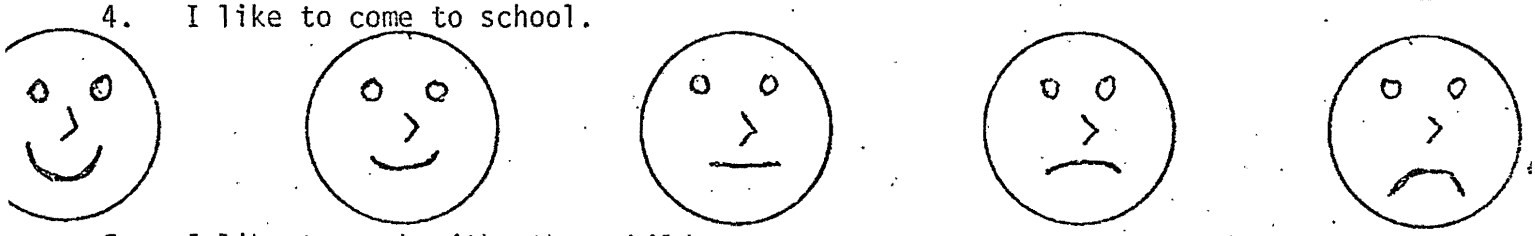
2. I am friends with a lot of children in other classes.



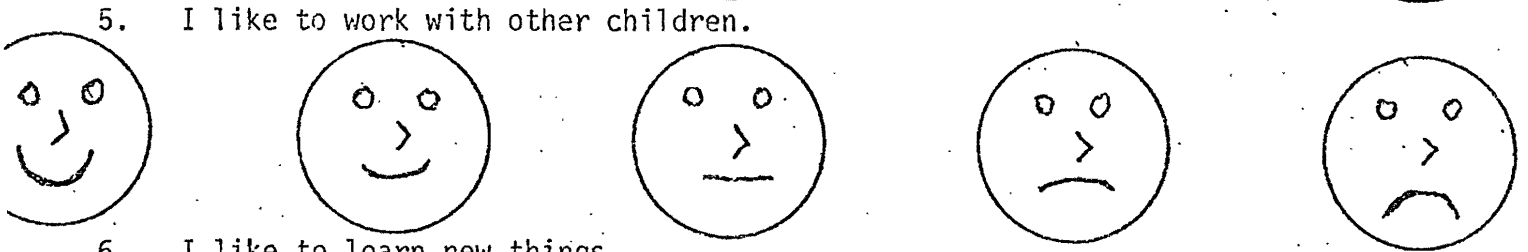
3. I like my teachers.



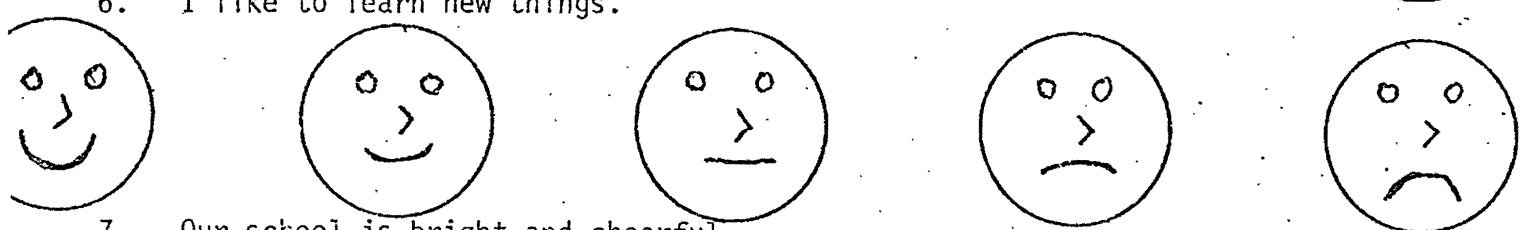
4. I like to come to school.



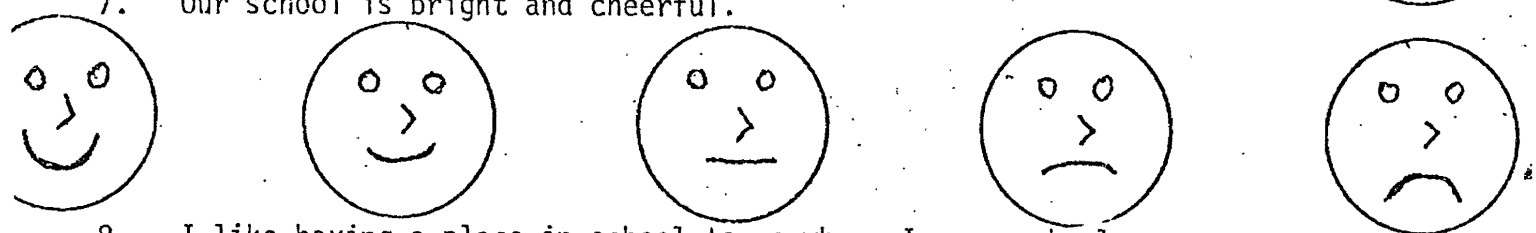
5. I like to work with other children.



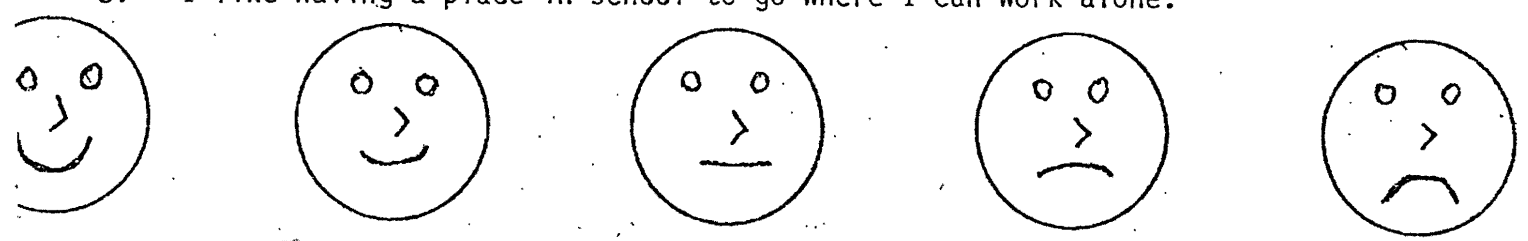
6. I like to learn new things.



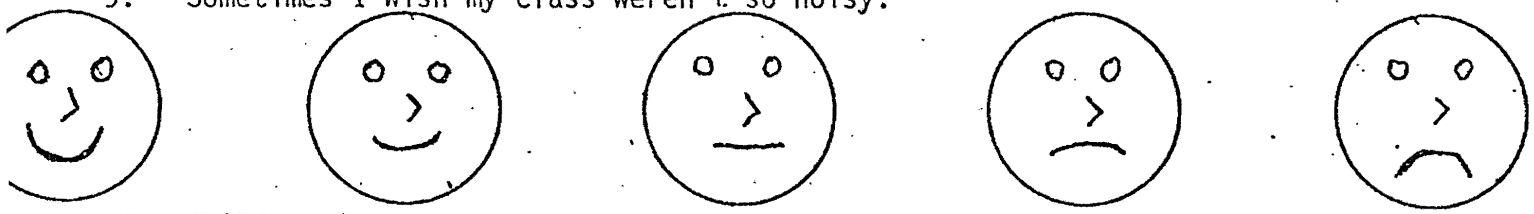
7. Our school is bright and cheerful.



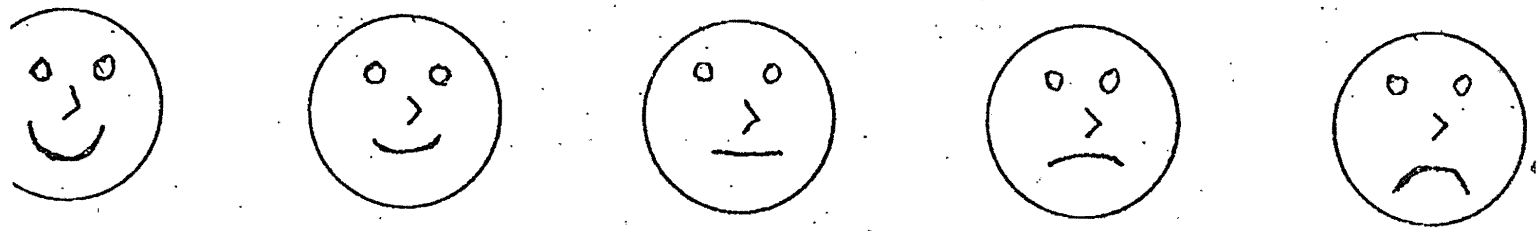
8. I like having a place in school to go where I can work alone.



9. Sometimes I wish my class weren't so noisy.



10. Children in our class like each other as friends.



FOOTNOTES

1. Edwald B. Nyquist and Gene R. Hawes, Open Education, (N.Y.: Bantam Books, Inc.) 1972, p.321

2. Larry Frase, George Smith and Douglas Vance, A Brief Guide For Teachers Towards The Utilization of the Concept of "Open Space", (Arizona: Arizona State University) 1971, p.11

3. Nyquist, op. cit., p.84

4. Frase, op. cit., p.8

5. See: Nyquist, op. cit., and Gertrude Noar, Individualized Instruction, (New York, John Wiley & Sons, Inc.) 1972

6. Herbert Kohl, The Open Classroom, (N.Y.: The N. Y. Review) 1971, p.15

7. Vincent Rogers, Teaching In The British Primary School, (London: The MacMillan Company) 1970, pp.293-294

8. Charles E. Silberman, Crisis In The Classroom, (N.Y.: Vintage Books) 1971, p.215

9. For a discussion of analysis of variance see: R. L. Anderson and F. A. Bancroft, Statistical Theory In Research, (N. Y.: McGraw-Hill) 1952

10. The reliability of these percentages is not indicated here, but is implicit in the analysis of variance.

11. Gary J. Anderson, The Assessment of Learning Environments, (Canada: Atlantic Institute of Education) 1971

12. For a discussion of factor analysis see IBM Application Program Number 1130-CA-06X, (N. Y.: IBM) 1971, pp.35-41

13. A factor score is a weighted combination of the scores of all the questions that contribute to that factor.

14. The idea of the faces was adopted from a Doctoral Thesis by Jack Nelson for the University of Oregon entitled, Collegial Supervision In Multiunit Schools: A Study of an Inservice Program for Primary Teachers in Newly Formed Units in Schools Which Have Received Two Forms of Organizational Development Training.

BIBLIOGRAPHICAL ENTRIES

1. Ackerman, Nathan W., et.al., Summerhill: For and Against, New York City: Hart Publishing Company, Inc., 1970.

2. American Association of School Administrators, Open Space Schools, Washington, D. C.: AASA, 1971.

3. Anderson, Gary J., The Assessment of Learning Environments: A Manual For The Learning Environment Inventory And The My Class Inventory, Nova Scotia, Canada: Atlantic Institute of Education, 1971.

4. Anderson, R. L. and Bancroft, T. A., Statistical Theory In Research, New York.

5. Bijon, Sidney, Peterson, Robert, and Ault, Marion, "A Method To Integrate Descriptive and Experimental Field Studies At The Level of Data and Empirical Concepts", Annal of Applied Behavior Analysis, 1968, pp.175-191.

6. Frase, Larry, Smith, George, and Vance, Douglas, A Brief Guide for Teachers Towards The Utilization of the Concept of "Open Space" As An Aspect of Instructional Individualization, Arizona: Arizona State University, 1971.

7. Gilbert, Elizabeth, "Systematic Observation: A Method In Child Study", Harvard Educational Review, Vol. XXV, No. 3, Summer 1955, pp.179-195.

8. Holt, John, How Children Fail, New York: Dell Publishing Co., Inc., 1971.

9. Kohl, Herbert R., The Open Classroom, New York: The New York Review, 1971.

10. Martin, Henry J. and Harrison, Charles H., Free to Learn, New Jersey: Prentice-Hall, Inc., 1972.

11. Neill, A. S., Summerhill, New York City: Hart Publishing Co. 1960.

12. Noar, Gertrude, Individualized Instruction, New York: John Wiley & Sons, Inc., 1972

13. Nyquist, Edwald B. and Hawes, Gene R., Open Education, New York: Bantam Books, Inc., 1972.

Bibliographical Entries - continued

14. Olson, Willard C. and Cunningham, Elizabeth, "Time Sampling Techniques", Child Development, 5, 1934, pp.41-57.

15. Rogers, Vincent R., Teaching In the British Primary School, London: The MacMillan Company, 1970.

16. Silberman, Charles E., Crisis In The Classroom, New York: Vintage Books, 1971.

17. Washburn, Ruth, "A Simultaneous Observation and Recording Method With Specimen Records of Activity Patterns In Young Children", Psych Monograph, 47, No. 2.