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THE EFFECTS OF CLASSROOM OPENNESS ON SCHOLASTIC ACHIEVEMENT AND STUDENTS' PERCEPTIONS OF THE LEARNING ENVIRONMENT: A DISCRIMINANT FUNCTION ANALYSIS

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THE EFFECTS OF CLASSROOM OPENNESS ON SCHOLASTIC ACHIEVEMENT AND STUDENTS' PERCEPTIONS OF THE LEARNING ENVIRONMENT: A DISCRIMINANT FUNCTION ANALYSIS

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CHAPTER I

INTRODUCTION

This study is concerned with analyzing the effects of classroom environment on student achievement and students' perceptions of their learning environment. The learning environment was analyzed from two perspectives: (1) The classroom environment as perceived by teachers and (2) The learning environment as perceived by students.

Using an appropriate cut-off point, the Open Education Teacher Questionnaire (OETQ) established criteria for openness and permitted the formation of two groups: open and conventional. Scholastic achievement and student perception of the learning environment were measured by the Metropolitan Achievement Test (MAT) and My Class Inventory (MCI), respectively. Teacher scores on the OETQ and pupil data were analyzed by use of a linear discriminant function to determine the effects, if any, the two classroom environments had on student achievement and perception. By using multi-

variate analysis, pupil scores are reduced to a single score which has maximum potential for distinguishing between members of two groups.

Ten open-space and fourteen conventional classrooms were randomly chosen from the Oklahoma City School System. Classrooms were classified as either open or conventional, and the group to which they became members represented the unit of analysis.

The term "nominal" membership is used in this study to describe teacher-student membership of open and conventional classrooms as they have been assigned by the school system. Results of the OETQ transformed "nominal" open and conventional classrooms to "derived" open and conventional classrooms. From the "derived" criteria, classroom environment, as perceived by teachers, and student achievement and perception scores were analyzed to determine relationships.

This study was correlational in nature. Manipulation of the independent variables was beyond the control of this investigation. Instead, the investigator considered conditions as they were in the randomly selected schools and attempted to highlight relationships among the variables using both univariate and multivariate statistical techniques.

Historical Background

This country's relatively short educational history has been an arena for much discussion of educational ideas, methods, and movements. In his book, History of Education in America,

Pulliam gives a chronological account of movements, forces, and events which shaped education in America.[1]

Many of these movements, with slight modification, originated in England and were transplanted to this country by educators who had visited English schools. The way in which England has historically influenced education in America bears a striking resemblance to the growth of open education in school districts throughout the United States.

Featherstone, in a series of articles in The New Republic, introduced the concept of open education to educators and parents in 1967.[2] Since that publication, interest in the approach suggests that it has become a serious alternative to the conventional self-contained classroom.

A number of educational innovations have challenged the graded self-contained classroom since its beginning in Boston in 1818. It prevailed without having any serious or widely accepted alternatives until the beginning of team teaching in the fall of 1957. A full discussion of team teaching is beyond the scope of this investigation. However, since it is a major aspect of many open education programs in the United States, several comments regarding its origin and definition are in order.

The first team-teaching project began at Franklin

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[1]John D. Pulliam, History of Education in America (Columbus, Ohio: Charles E. Merril Publishing Company, 1968), pp. 1, 38, 50, 56, 73-77 passim.

[2]Joseph Featherstone, The Primary School Revolution in Britain (The New Republic, [1967], pp. 2-16.

School in Lexington, Massachusetts by teachers of that school and several members of Harvard University's staff. The concept deployed children in a way that allowed them to receive the benefit of teacher competencies through a hierarchical arrangement of teams of teachers.[1] In 1958, fifty communities throughout the country used variations of the Harvard-Lexington Program with another three hundred school districts "expecting to introduce team teaching soon."[2]

An outgrowth and refinement of team teaching has appeared through various forms of differentiated staffing.[3] This plan for organizing an instructional staff utilizes classroom teachers at different responsibility levels and pay (assigned on the basis of training, competence, educational goals and difficulty of task), subject-matter specialists, special service personnel, administrators, paraprofessionals, student teachers, and interns.[4]

Open education, to many school districts in this

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[1]Robert Anderson, et al., "Team Teaching in an Elementary School," Change and Innovation in Elementary School Organization, ed. by Maurie Hillson (New York: Holt, Rinehart and Winston, 1967), p. 168.

[2]Maurie Hillson, "Pupils, Patterns, and Possibilities," Change and Innovation in Elementary School Organization, ed. by Maurie Hillson (New York: Holt, Rinehart and Winston, 1967), p. 189.

[3]Roy A. Edelfelt, "Is It Worth the Risk?" New York State Education (March, 1970), p. 22.

[4]Rozanne Weissman, "Pros and Cons of Differentiated Staffing -- A New Way of Organizing Schools," Maine Teacher (March, 1969), p. 3.

country, is synonymous with the organization of teams of teachers within a building of open architectural design. The concept of open education in this study will be defined by the way teachers interact with students along the following dimensions:

1. Guidance and extension of learning.
2. Provisioning the classroom for learning.
3. Diagnosis of learning events.
4. Reflective evaluation of diagnostic information.
5. Respect, openness, and warmth.
6. Seeking opportunities to grow personally and professionally.
7. Positive view of themselves and their roles.
8. Progressive view of children and the learning process.[1]

Open education is difficult to characterize. Walberg and Thomas contend that it has grown " . . . out of many old truths, perhaps cliches about children and the learning process."[2] In an attempt to account for its complexity and lack of standardization, they suggest that the approach has grown out of practical experience rather than philosophical, theoretical, or scientific foundations.

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[1]Anne M. Bussis and Edward A. Chittenden, "Toward Clarifying the Teacher's Role," in Open Education: A Sourcebook for Parents and Teachers, ed. by Ewald B. Nyquist and Gene R. Hawes (New York: Bantam Books, Inc., 1972), p. 119.

[2]Herbert J. Walberg and Susan Christie Thomas, "Open Education: An Operational Definition and Validation in Great Britain and the United States," American Educational Research Journal, 9 (Spring, 1972), 198.

To further complicate the problem of understanding the concept, the following labels are often used interchangeably: (1) open classroom, (2) open-space schools, (3) open education, (4) informal education, (5) integrated day, (6) British primary school, and (7) Leicestershire method. The terms open classroom and open education will be used synonymously in this study. The term "open-space school," when used, will refer only to the physical aspect of the building.

It is not uncommon for a school district to use one of the above labels to describe a wide variety of "open" education programs in its system. This inconsistency or program diversity is justified by educators as being necessary in providing for the needs of individual communities. Upon first-hand observation of ongoing "open" education programs, the individualized approach does not always appear to be practiced at the classroom or student level. Featherstone indicates that in many open programs, " . . . there is no basic change in methods of teaching or classroom organization."[1] He parallels this movement with progressive education in America's schools during the 1920's and 1930's. This conclusion was arrived at from his observation of schools both in Britain and the United States. Cremin makes the same point in speaking of the free school movement.[2]

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[1]Joseph Featherstone, Schools Where Children Learn (New York: Liveright, 1971), p. 38.

[2]Lawrence A. Cremin, "The Free School Movement: A Perspective," Today's Education, National Education Association, 3 (September-October, 1974), p. 71.

The evolving nature of open education results in a considerable amount of misunderstanding of the concept and program variance. To conceptualize the approach and its progression from conventional methods to an open method, it is necessary to place Nyquist's description of open and conventional classrooms on a continuum.[1] Figure 1 compares educational experiences of students in open classrooms with experiences of students in conventional classrooms.

Figure 1 -- Conventional Classroom and Open Classroom Continuum[2]

Conventional Classroom ⟷ Open Classroom		
1. information-gathering	Educational experience of students	1. problem solving
2. fact-centered		2. idea-centered
3. course-centered		3. experience oriented
4. subject-centered		4. interdisciplinary
5. norm-referenced evaluation		5. individualized instruction and evaluation
6. teacher dominated		6. teacher-student planning
7. vicarious and confined to classroom		7. interaction with things and extends to community

At the conventional end of the continuum, tendencies of the teacher, the curriculum, and the learning process

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[1]Ewald B. Nyquist, "Open Education: Its Philosophy, Historical Perspectives, and Implications," Open Education: A Sourcebook for Parents and Teachers, ed. by Ewald B. Nyquist and Gene R. Hawes (New York: Bantam Books, Inc., 1972), p. 83.

[2]Figure 1 was adapted from Nyquist's description of open and conventional classrooms, Open Education: A Sourcebook for Parents and Teachers, p. 83.

constitute the philosophic foundations of essentialism. Positions of these educationists appear to be consistent with a line of mainstream educators from Plato to programmed instruction advocates. These educators classify the curriculum into subjects, group learners by ability, and view knowledge as represented authoritatively by the teacher or in prescribed vicarious materials of instruction.[1] The Plowden Report associates the psychological foundations of conventional classrooms with the names of Thorndike, Hull, Pavlov, Skinner, and other behaviorists.[2]

Contrasting the conventional classroom is the open approach to teaching. The underlying philosophic principles of this approach are thought of in connection with the progressive work of Dewey, and the rights of children for which Rousseau argued. Advocates of the open education approach claim that the environment is much freer, more informal, highly individualized and gives the student a voice in planning his educational program. Walberg and Thomas believe that educators at this end of the continuum have points of view which are ". . . consonant with developmental, human-

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[1]Walberg and Thomas, "Open Education: An Operational Definition and Validation in Great Britain and the United States," 198.

[2]Central Advisory Council for Education, "Children and Their Primary Schools: The Plowden Report," Open Education: A Sourcebook for Parents and Teachers, p. 29.

istic, and clinical psychology."[1] This school of theory is opposed to psychology theories that have been most influential in American education; connectionism, behaviorism, and psychometry.

The point has been made that the evolutionary nature of open education results in program uniqueness and diversity. If one accepts the notion that open education is more practical in terms of educating children, and attempts to achieve this goal, it is conceivable that open classrooms will be located at many points along the spectrum. The point of location of any school's program would depend on that program's characteristics vis'-a-vis' Nyquist's description

Need for the Study

Walberg and Thomas point out that " . . . there has been very little research and evaluation on open education, aside from testimonials by exponents and reporters."[2] Their point is substantiated by an annotated bibliography on open education by the Toronto School Board (Ontario).[3] The School Board compiled a list of eighty-six annotations on open

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[1]Walberg and Thomas, "Open Education: An Operational Definition and Validation in Great Britain and the United States," p. 198.

[2]Walberg and Thomas, "Open Education: An Operational Definition and Validation in Great Britain and the United States," p. 197.

[3]Metropolitan Toronto School Board, SEF Annotated Bibliography on Informal Education (Ontario, Canada: ERIC Document Reproduction Service, ED 063 619, 1972), pp. 1-24.

education which fall into the following headings:

1. General (35 annotations).
2. Description of British informal education by British writers (7 annotations).
3. Description of British informal education by American writers (10 annotations).
4. Description of American informal education by American writers (6 annotations).
5. Methodology for informal education (7 annotations).
6. Teacher education for informal education (6 annotations).
7. Criticism of informal education (6 annovations).
8. Research and evaluation of informal education (7 annotations).
9. Bibliographies on informal education (2 annotations).[1]

Examination of the list of annotations showed that, with the exception of the Plowden Report, only three studies dealt with achievement in an evaluative manner. One study which used the Iowa Test of Basic Skills, concluded that there was no significant difference in the achievement of three open and three conventional third-grade classrooms.[2] The other two studies were performed in England.[3] Test results were not made available.

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[1]Metropolitan Toronto School Board, SEF Annotated Bibliography on Informal Education (Ontario, Canada: ERIC Document Reproduction Service, ED 063 619, 1972), p. 17.

[2]Ibid.

[3]Ibid., p. 16.

Research and evaluation of social climate is even less conclusive. The Toronto School Board's annotated bibliography included only one study comparing the climate of "open" and "closed" schools. In the study, Appleberry and Hoy focused on the ideological orientation of school personnel and the type of organizational climate that resulted from their ideologies.[1] By using the Pupil Control Ideology Form (PCI) and the Organizational Climate Description Questionnaire (OCDQ), investigators of the study found that schools with open climates were significantly more humanistic than schools with relatively closed climates.

An examination of fifty projects, papers, and abstracts recorded with ERIC indicated a need for this study. ERIC recordings showed that much attention has been directed toward the physical aspects of open education, e.g., open architectural design, furniture, movable partitions, and arrangement of space.[2] Little attention was paid to student perception of the learning environment and achievement.

As part of an open-space research program at Stanford University a national survey was conducted to determine open

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[1]James B. Appleberry and Wayne K. Hoy, "The Pupil Control Ideology of Professional Personnel in 'Open' and 'Closed' Elementary Schools," Educational Administrative Quarterly, 5 (Autumn, 1969), 74-85.

[2]An ERIC search was performed by the GIPSY Program, University of Oklahoma, October 1, 1973. Open education labels referred to in the text were used as descripters.

education trends in this country.[1] A significant finding of the study showed that over 50 percent of 2,500 new schools constructed from 1967 to 1969 were of open type design. Table I gives a breakdown in new building construction for the elementary, middle, and senior high school levels.

In order to get an accurate assessment of building construction, states were asked to classify schools accordingly: (1) open space, (2) modified, and (3) conventional buildings. The percentage of schools for each category is displayed in Table II.

TABLE I

OPEN-SPACE TRENDS NATIONAL SURVEY
THREE-YEAR PERIOD 1967-1969[2]

	Open	Conventional
Elementary School	54%	46%
Middle School	52%	48%
Senior High School	52%	48%

[1] Open-space Schools Project Bulletin, Stanford University, California School Planning Laboratory, No. 1 (ERIC Document Reproduction Service, ED 057 484, 1970), p. 4.

[2] Open-space Schools Project Bulletin, Stanford University, California School Planning Laboratory, No. 1 (ERIC Document Reproduction Service, ED 057 484, 1970), p. 3.

TABLE II

DISTRIBUTION OF NEW SCHOOL CONSTRUCTION
IN THREE DESIGN CATEGORIES,
THREE-YEAR PERIOD
1967-1969[1]

	Open	Modified	Conventional	Total
Elementary School	25%	29%	46%	1,552
Middle School	19%	33%	48%	429
Senior High School	14%	38%	48%	643

The Stanford survey showed California, Wisconsin, Minnesota, and Florida setting the pace in terms of open and modified designs. It should be noted that the survey percentages for true open and modified designs in Table I are combined. By comparison, Table II lists elementary schools as having 25 percent true open, and only 14 percent of the high schools had open plan designs.

Brunetti reports similar results from an analysis of schools in the Architecture Exhibit at the 1971 AASA Convention.[2] Results of the AASA Exhibit are summarized in Table III.

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[1] Ibid., p. 2.

[2] Frank A. Brunetti, Open Space: A Status Report (Stanford University, California: ERIC Document Reproduction Service, ED 057 485, 1971), pp. 4-7.

TABLE III

AASA CONVENTION - SCHOOL ARCHITECTURE
EXHIBIT 1971[1]

	Open	Conventional
Elementary School	91%	9%
Middle School	66%	34%
Senior High School	39%	61%

Although Table III percentage distribution for elementary, middle, and high schools were somewhat different from the national survey, the trend toward open space was dominant in the exhibit. The influence of open design planning was strongest at the elementary level as only 9 percent of the elementary schools were of conventional design as compared to 61 percent of the high schools.

Dopyera argues that since the United States is spending billions of dollars for programs to benefit children, we certainly need evidence that the programs make a difference.[2] Although the above new building percentages are indicators of growing interest, it is unlikely that the building itself

[1] Ibid., p. 6.

[2] John Dopyera, What's Open Education? Some Strategies and Results (ERIC Document Reproduction Service, ED 059 168, 1972), p. 2.

will have any direct measurable effect on student achievement or the learning environment.

While a review of related literature identified several studies comparing student achievement or organizational climate measured at the teacher level, none of the studies compared achievement and the student's perception of social climate. It would appear that before either or both of the variables (achievement and climate) can be compared between open and conventional classrooms, open education needs to be operationally defined. The first task of this study was to determine classroom openness by the use of the Open Education Teacher Questionnaire (OETQ) developed by Walberg and Thomas, and subsequently used in sixty-two United States and British classrooms by Evans.[1, 2]

Statement of the Problem

The question of whether one educational method is more effective than another is a perennial argument among educators and the lay population alike. This study will analyze variables of two teaching-learning processes (open and conventional) in an effort to add empirical information to the argument.

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[1]Herbert J. Walberg and Susan C. Thomas, Characteristics of Open Education: A Look at the Literature for Teachers (ERIC Document Reproduction Service, ED 058 164, 1971), pp. 100-09.

[2]Judith Evans, Characteristics of Open Education: Results from a Classroom Observation Rating Scale and a Teacher Questionnaire (ERIC Document Reproduction Service, ED 058 160, 1971), pp. 41-54.

The investigation is directed toward answering the questions of whether there is a difference between "derived" open and conventional classrooms based upon student's perceptions of the learning environment, reading, and mathematics scores. The learning environment variables received a great deal of attention in that it is hypothesized as being a major contributor to reading and mathematics achievement.

Results of the Open Education Teacher Questionnaire (OETQ) transformed "nominal" teacher membership of the two groups to "derived" teacher membership. Analysis of student data (dependent variables) of "derived" open and conventional groups yielded information on the differences between the two instructional methods.

Stated in question form the study seeks these answers: (1) Will "derived" teacher membership differ significantly from "nominal" teacher membership on the basis of OETQ scores? (2) Will there be a more positive relationship between the learning environment and classroom openness? (3) Will there be a more positive relationship between reading achievement and classroom openness? and (4) Will there be a more positive relationship between mathematics achievement and classroom openness?

Although the questions may suggest a study of Pearson product moment correlation coefficients, the investigation is not restricted to this simplistic statistical technique. Utilization will be made of a multivariate computer program which extracts a function that will allow for student classi-

fication based on individual variables and a composite that explains most of the variance. While F-values may yield statistical significance for the individual variables, the classification scheme will provide more practical value. Therefore, hypotheses are stated in terms of correct classification of students.

Rationale and Hypotheses

The general research hypothesis is that derived open and conventional classrooms will be significantly different from "nominal" classrooms in terms of teacher membership. It is further hypothesized that student test results will enable a distinction to be made between open and conventional classroom membership. Thus, the prediction is advanced that student membership in "derived" open and conventional classrooms will be reflected by the dependent variables (learning environment, reading, and mathematics achievement).

A prior assumption has been made by this investigator that the learning environment (as perceived by pupils) is a major contributor to reading and mathematics achievement. Anderson maintains that, " . . . classes have a distinctive personality or climate which influences the learning of their members."[1] He lists fourteen scales in his Learning Environment Inventory (LEI) for assessing the climate.[2]

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[1]Gary J. Anderson, "Effects of Course Content and Teacher Sex on the Social Climate of Learning," American Educational Research Journal, 8 (November, 1971), 653.

[2]Ibid., 135.

Scores from the eight scale OETQ will set up an empirically derived category in which students are certain to belong to one of the two groups. The learning environment will be measured by the My Class Inventory (MCI) which contains the following scales: (1) Satisfaction; (2) Friction; (3) Competition; (4) Difficulty; and (5) Cohesiveness. This instrument is the elementary school version of the Learning Environment Inventory (LEI). Thus, a classroom's total learning environment will be described by the mean score of all five scales. Following the major hypothesis of the learning environment, each of the five scales was treated as a sub-hypothesis. The hypotheses were stated in terms of "derived" membership in open and conventional classrooms. Stated in null form, the hypotheses were as follows:

Ho_1 Individuals cannot be classified greater than chance into open and conventional groups on the basis of the most parsimonious composite of variables.

The Satisfaction scale is concerned with whether students are " . . . well satisfied with the work of the class."[1] Studies by Walberg and Anderson have shown that Satisfaction is related to affective learning.[2] Heslin and Dunphy argue that there is a positive relationship between Satisfaction

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[1]Anderson, "Effects of Course Content and Teacher Sex on the Social Climate of Learning," p. 138.

[2]Herbert J. Walberg and Gary J. Anderson, "Classroom Climate and Individual Learning," American Educational Research Journal, 7 (1968), 414.

and individual productivity.[1] It is hypothesized that:

$Ho_{1.1}$ Individuals cannot be classified greater than chance into open and conventional groups on the basis of satisfaction.

Friction is thought of as a lack of cooperation by certain members of the class. Individual pupil perceptions of class friction or hostility were found to relate negatively to learning in one study by Walberg and Anderson.[2] This conclusion is confusing in view of another study by these researchers which found that " . . . class gains on an understanding-type learning criterion were positively related to class friction."[3] Anderson attempts to explain this confusion by saying that ". . . different types of teachers, different types of methodologies, different types of courses, and different types of classroom social climates are appropriate for different types of learners . . . ."[4] Therefore, it is predicted that given the variety of experiences which students encounter in open classrooms, friction will be reduced. The emergent hypothesis is:

$Ho_{1.2}$ Individuals cannot be classified greater than chance into the two groups on the basis of friction.

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[1] R. Heslin and D. Dunphy, quoted by Anderson, American Educational Research Journal, 7 (March, 1970), 136.

[2] Walberg and Anderson, "Classroom Climate and Individual Learning," p. 417.

[3] Ibid., p. 416.

[4] Anderson, "Effects of Classroom Social Climate on Individual Learning," pp. 136-37.

Competitiveness is concerned with students competing to see who can do the best work. Anderson speculates that friction may be a guise under the term of competition. He expands this notion by saying, " . . . if extremely high friction is similar to competition, it could be that extremely low friction is but another term for cooperation."[1]

Conventional classrooms tend to place much value on norm-referenced evaluation which subsequently leads to a high level of competition. Counter to this position is the open classroom which endorses cooperation and focuses on individual growth. In view of the different assumptions about the growth process held by open and conventional teachers, it is appropriate to test the following hypothesis:

$Ho_{1.3}$ Individuals cannot be classified greater than chance into the two groups on the basis of competition.

Difficulty is concerned with whether students are constantly challenged. Research by Anderson suggests that there is a significant relationship between difficulty and learning, and " . . . the more difficult classes are, the more pupils gain over the year."[2] He theorizes that positive effects of high class difficulty have corresponding negative effects on student satisfaction and attitudes toward the class, the school, and the subject matter. With primary

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[1] Ibid., p. 148.

[2] Anderson, "Effects of Classroom Social Climate on Individual Learning," p. 149.

emphasis on the acquisition of subject-matter content by conventional teachers, and the concern by open classroom teachers that students enjoy and appreciate the subject, it is hypothesized that:

$Ho_{1.4}$ Individuals cannot be classified greater than chance into the two groups on the basis of difficulty.

Cohesiveness pertains to whether members of a class are personal friends. Anderson found that cohesion (or intimacy) " . . . interacts with ability for females, while for males the effect of cohesiveness was similar regardless of ability."[1] Anderson also found that small classes are more cohesive than larger classes. Since open space schools provide opportunities for more large group activities than conventional classrooms, the emergent hypothesis is:

$Ho_{1.5}$ Individuals cannot be classified greater than chance into the two groups on the basis of cohesiveness.

As a result of Featherstone's observation of reading instruction in British primary schools, he concluded that " . . . it is hard to say just how they learn to read since there are no separate subjects."[2] Featherstone further states that the lecture style of teaching reading, and the teaching of reading to homogeneous ability groups while trying to keep order in the classroom have disappeared in

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[1]Anderson, "Effects of Classroom Social Climate on Individual Learning," p. 148.

[2]Featherstone, Schools Where Children Learn, p. 13.

British open classrooms.

In describing the informality and comfort of reading areas in open schools, Hertzberg and Stone contend that " . . . books are not put away by the teachers and reserved for use at specific times of the year; all books are always available to children when they need them."[1] These writers draw upon a classroom teacher's quote by saying that it's the teacher's responsibility " . . . to see that the child progresses in reading, to see that he knows phonics and is growing in vocabulary." The teacher also felt that it was her responsibility to help the child enjoy what he reads by " . . . discovering what interests the child, and then steering him to books and stories that meet the interest."[2]

Contrasting reading practices of open and conventional classrooms, Williams' conclusion is similar to the above teacher's quote. She says that reading in the open classroom requires skill in " . . . setting up a trustful environment of warm relations."[3] According to Williams, the teacher also encourages, supplements, subtly provokes and provides, listens,

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[1]Alvin Hertzberg and Edward F. Stone, Schools Are for Children: An American Approach to the Open Classroom (New York: Schocken Books, 1971), pp. 17-18.

[2]Hertzberg and Stone, Schools Are for Children: An American Approach to the Open Classroom, p. 23.

[3]Rosemary Williams, "Reading in the Informal Classroom," Open Education: A Sourcebook for Parents and Teachers, ed. by Ewald B. Nyquist and Gene R. Hawes (New York: Bantam Books, Inc., 1972), p. 140.

expands, expounds upon, and asks the right questions at the right time, all of which is done in realistic situations.

Featherstone believes that there is a need for re-ordering values related to the evaluation of reading.[1] A significant question, in his opinion, is to ask if the environment causes children to like reading. "If children get perfect reading scores and then grow up to read only the tabloids and movie magazines," Silberman quotes a British educator, "I shall have failed. My job is to develop [positive] attitudes and values as well as skills."[2]

According to Gross and Gross, " . . . the available evidence indicates that even when measured by present tests, children in open classrooms progress normally in reading and mathematics."[3] These writers claim that there is enough evidence available to support the theory that open classroom practices cause an increased desire in children to read and write. Silberman advances the same argument by saying that " . . . although there is no evidence that [open classrooms] bring superior standards in reading, they may well benefit their pupils in other ways."[4] Therefore, the emergent

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[1]Featherstone, Schools Where Children Learn, p. 43.

[2]Charles E. Silberman, Crisis in the Classroom (New York: Random House, 1970), p. 240.

[3]Beatrice Gross and Ronald Gross, "A Little Bit of Chaos," Open Education: A Sourcebook for Parents and Teachers, ed. by Ewald B. Nyquist and Gene R. Hawes (New York: Bantam Books, Inc., 1972), p. 17.

hypothesis is:

Ho_2 Individuals cannot be classified greater than chance into the two groups on the basis of reading scores.

Nyquist argues that a society which values diversity should at least offer students, their teachers, and their parents another option, or another approach to education. He arrived at this conviction after concluding that mathematics skills are no worse than those acquired by children in conventional classrooms, while other significant values are derived.[1]

Hertzberg and Stone look at mathematics activities in conventional classrooms as being too test- or workbook-oriented.[2] This is in contrast to Featherstone's report describing mathematics activities in open classrooms. He says that " . . . aspects of addition, multiplication, and division arise from real situations in the classrooms. These operations are performed on real materials, not as abstract exercises."[3] Rasmussen lends support to Featherstone's statement by saying that in an open classroom, "The math area is equipped with things that can be counted, measured, rearranged, joined, and portioned."[4] He speaks of instruments

[1]Nyquist, Open Education: A Sourcebook for Parents and Teachers, p. 88.

[2]Hertzberg and Stone, Schools Are for Children, p.66.

[3]Featherstone, Schools Where Children Learn, p. 29.

[4]Lore Rasmussen, "The Children and Their Needs," Open Education: A Sourcebook for Parents and Teachers, p. 146.

and machines with buttons, levers, and cranks that count and record.

It appears that Piaget has had considerable influence on open classrooms in England. British open classroom practices seem to be consistent with his idea that children learn to think in stages. Piaget's ideas on children's developmental stages are interpreted by open educators, in this country and abroad, as meaning that

> . . . until youngsters are old enough to handle verbal abstraction . . . children are presented with situations that encourage them to experiment, to manipulate things and symbols . . . in such a way as to permit them to learn at their own pace as well as in their own way.[1]

The workbook approach of much conventional mathematics instruction, in which young children are expected to learn from verbal abstractions, contrasted with open education practices is sufficient rationale to prescribe the following hypothesis:

Ho_3 Individuals cannot be classified greater than chance into the two groups on the basis of mathematics scores.

Limitations of the Study

Because of the comparatively small number of open-space schools from which to draw, there is likely to be greater error in the randomization procedure.[2] Therefore, caution should be taken in generalizing to the population of open classrooms.

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[1]Silberman, Crisis in the Classroom, p. 218.

[2]Fred N. Kerlinger, Foundations of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1964), pp. 61-63.

The sample was drawn from the Oklahoma City Independent School District and, specifically, from elementary schools (K-4 and K-5) which included the second, third, and fourth grades. Two of the school districts' elementary schools have a kindergarten through fifth grade organizational arrangement. The other elementary schools (57) have a kindergarten through fourth grade arrangement.

That questionnaires of any kind might be subject to acquiescent response bias is a point made by the developers of the Open Education Teacher Questionnaire (OETQ).[1, 2] Anderson has another point of view regarding the respondent's perception of his environment. With reference to the learning environment, he maintains that the respondent's perception of his environment results in " . . . high-inference measures . . . unlike low-inference measures which are objective counts of observed behavior."[3]

There are other important factors of a classroom's social climate; however, the climate dimensions with which this study is concerned are limited to scales of the My Class Inventory (MCI): Satisfaction, Friction, Competitiveness, Cohesiveness, and Difficulty.

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[1]Evans, Observation Rating Scale and Teacher Questionnaire, p. 30.

[2]Walberg and Thomas, Operational Definition and Validation in Great Britain and the United States, p. 204.

[3]Anderson, Manual for the Learning Environment Inventory and the My Class Inventory, p. 4.

Operational Definitions

Open Classroom Teacher:--An open classroom teacher is one who scores above the median on the Open Education Teacher Questionnaire (OETQ) irrespective of her "nominal" classroom.

Open Classroom:--An open classroom is identified as belonging to teachers who score above the median on the (OETQ) irrespective of her "nominal" classroom.

Conventional Classroom Teacher:--Those teachers who score below the median on the (OETQ). Heathers says this about a [conventional] self-contained classroom:

> A general elementary teacher is assigned to one grade level class for the full day and is called upon to teach all curricular areas except as assisted or replaced by specialists in art, music, physical education, remedial reading and speech, library, or foreign language.[1, 2]

Open-space School:--A building that has the equivalence of at least three normal classes combined to form one common instructional area that cannot be divided by a floor-to-ceiling partition system.[3]

Modified School Design:--A building that has a floor-to-ceiling partition system which divides instructional space

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[1]Glen Heathers, "Grouping," Encyclopedia of Educational Research (4th ed.; New York: New York University, 1969), p. 560.

[2]The 1969 edition of the Encyclopedia of Educational Research did not devote any space to open education as described by the commonly-known descripters.

[3]Open-space Schools Project Bulletin, p. 13.

into areas equivalent to one and two classrooms, or that systematically provides lateral visual separation between adjacent classrooms.[1]

Conventional School Design:--A building that is composed of separate instructional spaces designed to accommodate only one teacher and one class.[2]

Team Teaching:--Team teaching concepts discussed in this study involve a hierarchial organization of teachers in terms of authority, responsibility, and pay; and a coordinate arrangment in which two or more teachers having equal authority and shared responsibility for the instruction of a large class of students. The number of students assigned to the group is usually equal to the number of students assigned to a self-contained classroom multiplied by the number of teachers on the team.[3]

Classroom Learning Environment:--The mean score of a classroom measured by the five scales of the My Class Inventory: Friction, Competition, Satisfaction, Difficulty, and Cohesiveness.

Nominal Group Membership:--The term applies to the designation of open and conventional classroom membership by the school system before administration of the (OETQ).

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[1] Ibid.

[2] Ibid., p. 14.

[3] Maurie Hillson, Change and Innovation in Elementary School Organization, p. 165.

Derived Group Membership:--The term used to describe open and conventional classroom membership after administration and analysis of the (OETQ).

More Open:--The term used to describe the upper twenty-five percent of the sample as determined by the (OETQ).

More Conventional:--The term applied to the lower twenty-five percent of the sample as determined by the (OETQ).

Organization of the Remainder of the Study

The remainder of the study is organized into four chapters. Chapter II contains a review of related studies and a theoretical framework for open education. Review of literature for the theoretical framework is confined to writers who have given attention to the eight themes which comprise this study's operational definition of open education.

Chapter III consists of information related to the design, the sample and population, the collection of data, and the instruments used. Treatment of the data concludes this chapter.

Chapter IV reports the findings of the study. Date related to the linear function of dependent variables are analyzed via discriminant analysis as a composite set to distinguish between open and conventional classrooms.

Chapter V contains conclusions and recommendations for further study.

CHAPTER II

REVIEW OF SELECTED LITERATURE

Exponents of open education readily admit that there are no universally agreed upon models of the open classroom concept. Nor should there be, they argue. Having visited many English primary schools, Armington reports that they varied widely in style and quality, and that they " . . . emphatically do not represent a system, program or package."[1] However, many visitors and reporters of open classrooms, Armington included, agree that certain practices or characteristics are essential in the development of a theoretical framework for open education.

While commissioned by Educational Testing Service, Bussis and Chittenden investigated a number of British and United States open classrooms.[2] They constructed a theoretical framework for evaluating beliefs and activities of the open teaching-learning process. Subsequent validation and refinement of the framework was performed by Walberg

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[1]D. E. Armington, A Plan for Continuing Growth. Proposal submitted to United States Office of Education, December, 1968, p. 4.

[2]Anne M. Bussis and Edward A. Chittenden, Analysis of an Approach to Open Education (Princeton, New Jersey: Educational Testing Service, August, 1970).

and Thomas,[1] and a group of advisers from the Educational Development Center (EDC).[2] Those responsible for the theoretical framework point out that the objective was to " . . . promote a philosophy of education," rather than "a set of educational prescriptions."[3]

This study is based on the theoretical framework which the above researchers advanced. It is constructed from eight themes which give attention " . . . to the child, the teacher, and the physical environment."[4] The study takes the position, as did the developers, that open schools may or may not be self-contained. While the architectural design may encourage practices associated with open education, open space per se plays a secondary role to the eight themes.

Classroom openness was established in this study by using the Open Education Teacher Questionnaire (OETQ). The (OETQ) was designed to operationalize the eight themes of the open education theoretical framework (see Chapter II).

Review of the literature has a twofold purpose: to review related literature, and to review literature which addresses itself to the theoretical framework of open education.

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[1]Herbert J. Walberg and Susan C. Thomas, Characteristics of Open Education: A Look at the Literature for Teachers (ERIC Document Reproduction Service, ED 058 164, 1971).

[2]Bussis and Chittenden, Analysis of An Approach to Open Education, p. 10.

[3]Ibid., p. 1.

[4]Ibid., p. 5.

The related literature section is concerned with results of alternative instructional methods and organizations as they have been compared with the conventional method. Review of literature for the theoretical framework is concerned with examining points of view of writers that have given attention to characteristics of the themes which comprise the framework. While the theoretical framework is broken into subtopics, each of which is discussed separately, the interrelationships of the eight themes should emerge.

The order of discussion should in no way suggest a value or importance of the themes. However, since assumptions about children's learning and the nature of knowledge appears to be the fundamental difference between conventional and open teachers, Assumptions will be the first topic discussed in the theoretical framework section. Further, assumptions about knowledge and the learning process appear to influence the view teachers have of the other seven themes; e.g., Provisioning, Instruction, Diagnosis, Evaluation, Self-Perception, Humaneness, and Seeking.

Review of Related Literature

Empirical findings in an overwhelming number of educational studies have been less than encouraging for educational innovators. Results of many studies have shown a lack of statistical significance between novel methods and conventional methods. Explanations of lack of significance range

from the use of inappropriate research designs for various units of analysis (individual and systems levels),[1] to the argument that tests are too narrow in scope and are insensitive even in the area in which they do function.[2] Herriott and Muse argue for the use of more multivariate techniques in " . . . understanding the causes of variation in educational effects."[3]

Reviews of educational research have consistently reported that different teaching procedures produce little or no difference in the amount of knowledge gained by students.[4] Coleman concluded in his Equal Educational Opportunity Survey that " . . . schools make no difference; families make the difference."[5] The survey suggested that

> . . . characteristics of the teaching staff and social characteristics of the student body correlated more highly with student achievement than with other factors such as facilities and curriculum when home family background was statistically controlled.[6]

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[1]Robert E. Herriott and Donald N. Muse, "Methodological Issues in the Study of School Effects," in Review of Research in Education, ed. by Fred N. Kerlinger (Itasca, Ill.: F. E. Peacock Publishers, Inc., 1973), p. 212.

[2]J. M. Stephens, The Process of Schooling: A Psychological Examination (New York: Holt, Rinehart and Winston, Inc., 1967), p. 82.

[3]Herriott and Muse, "Methodological Issues in the Study of School Effects," pp. 209-10.

[4]Stephens, The Process of Schooling: A Psychological Examination, p. 9.

[5]Godfrey Hodgson, "Do Schools Make a Difference?" The Atlantic (November, 1973), p. 35.

[6]John D. McNeil, "Forces Influencing Curriculum," American Educational Research Association, 3 (June, 1969), p. 294.

After summarizing some two hundred investigations, Stephens concluded that " . . . one method turns out to be as good as another and that promising innovations produce about as much growth as the procedure they supplant, but no more."[1] He also directs attention to some three hundred ninety-three educational investigations in which Schramn compares television teaching with other forms of instruction. Only eighty-three studies showed superiority for television while fifty-five reported superior results for the traditional classroom.[2] In comparing programmed instruction with conventional forms of study, investigators have found no clear-cut advantage or disadvantage for either method.[3]

Team teaching has gotten good results, according to Ginther and Shrayer, but the results are not consistently better than those of traditional teaching. Studies in team teaching have led researchers to conclude that this organizational pattern " . . . is at least as good as the traditional procedures."[4]

Investigations reported by Stephens reveal that students learn about as much in

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[1]Stephens, The Process of Schooling: A Psychological Examination, p. 72.

[2]Ibid., p. 74.

[3]Ibid., p. 82.

[4]J. R. Ginther and W. A. Shrayer, "Team Teaching in English and History at the Eleventh Grade Level," School Review (June, 1962), pp. 303-13.

> . . . large classes as in small classes . . . in homogeneous groups as in heterogeneous groups . . . in core curricula as in traditional curricula . . . in lecture classes as in discussion classes [and] . . . in teacher-centered approaches as in [problem-centered] approaches.[1]

Central conclusions drawn by Flanagan in his Project Talent are that " . . . school size, average size of classes, age of building and suburban locations are unlikely to be important causes of excellence of school output."[2] He concluded from data of the project that efforts directed toward supervision of instruction may have a more important instructional effect than the above administrative arrangements.

The Plowden Report indicates that parental attitudes have greater correlation with student achievement than material home circumstances or variations in school and classroom organization, instructional materials and particular teaching practices.[3] A primary conclusion of the Plowden Report is that school efforts can be reinforced by arranging for parental participation in classroom instruction.

In a large-scale experiment involving 75,000 elementary school children and 2,500 teachers in the New York City school system which compared "activity" classes with control classes, data revealed that children in activity classes

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[1]Stephens, The Process of Schooling: A Psychological Examination, pp. 10, 75-82.

[2]McNeil, "Forces Influencing Curriculum," American Educational Research Association, p. 294.

[3]Ibid., pp. 294-95.

were superior in critical reading skills, " . . . the use of elementary research techniques, and in the development of civic attitudes and understanding of social relationships."[1] Differences favored the children in activity classes in all but three of the knowledge and skills area. Morrison claims that improved sampling of the activity program tended to lessen or to eliminate the difference between the two groups in the three knowledge and skills area.

Pistor's experiment used two groups of students, all of whom were in the fifth and sixth grades. His "progressive" group had been in a "traditional" program for the first two years of school and in a progressive program for grades three and four. The other group had been in a traditional program for all of the first four years.[2] The two groups were tested at the beginning of the experiment, midway through the experiment, and at the end of the experiment.

> The experimental group made higher average scores during each of these testings in reading, language usage, literature, history, geography, hygiene, arithmetic, and in all subjects combined.[3]

Wrightstone's appraisal of elementary school practices included selected "newer-type" schools and "conventional"

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[1]B. Othanel Smith, William O. Stanley, and J. Harlan Shores, Fundamentals of Curriculum Development (New York: World Book Company, 1957), p. 398.

[2]Ibid., p. 399.

[3]Ibid., p. 402.

schools. Students were individually matched from newer-type schools with those in conventional schools on the basis of intelligence, chronological age, and socio-economic status. The programs differed in terms of organization of subjects (separate or integrated subjects), activities included in the curriculum, regard for children's interest, and the method of achieving social progress.[1] There was a significant difference favoring individuals in newer-type schools in the following areas: current social, economic, and aesthetic problems; more tolerant attitudes toward social and economic affairs; more honesty on self-marking tests; more self-initiated and experimental acts; physical fitness; reading, language, and spelling.[2]

Smith, Stanley and Shores report results of three curriculum experiments at the secondary school level which parallel the preceding three elementary school experiments in terms of influence upon programs of curriculum development.[3] The Eight-Year Study shows that graduates of the study's most innovative schools excelled those of the most conventional schools. Findings of the investigation conclude

> . . . that the thirty schools' graduates as a group [did] a somewhat better job than the comparison groups whether success was judged by college standards, by

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[1]Smith, Stanley, and Shores, Fundamentals of Curriculum Development, pp. 403-04.

[2]Ibid., pp. 405-06.

[3]Ibid., pp. 407-13.

the students' contemporaries, or by the individual students.[1]

Wrightstone's experimental design for the secondary school experiment is the same as that used in his elementary school experiment.[2] He found that students in the experimental program were significantly superior in working skills, interpreting facts, civic beliefs, self-initiative, and cooperative activities in the areas of social studies, English, and fine arts. Wrightstone's findings further revealed superiority for experimental students in some aspects of the natural sciences, in French, and in physical fitness. Difference in other areas of the natural sciences favored the experimental students, but the difference was not significant. Students in the conventional schools were superior in organizing skills and recitational activities in the areas of social studies, English, fine arts, and the natural sciences. Difference in Latin grammar also favored students in the conventional school. None of the differences favoring students of the conventional school were statistically significant.[3]

The Knight and Mickelson investigation was concerned with problem-centered instruction as compared with subject-centered instruction.[4] Results do not indicate a significant advantage

[1]Smith, Stanley, and Shores, Fundamentals of Curriculum Development, p. 416.

[2]Ibid., p. 407.

[3]Ibid., pp. 409-10.

[4]Ibid., p. 411.

are purchased apparatus and a wealth of "homemade" and raw materials for all types of work. Featherstone observed that " . . . in good infant schools, there are no textbooks and no class readers." He says books at all levels of difficulty are provided, many of which are single books.[1] Materials and reference books, Gardner and Cass point out, are made easily available on shelves or tables around the classroom.[2]

Activities of children in open classrooms frequently extend beyond the walls of the school. Bussis and Chittenden maintain that the use of natural environmental materials and the extension of activities into the community by British open schools are vastly different from the instructional approach used by their American counterparts. They identify this as being an area in which open classroom teachers in the United States are " . . . most inarticulate and vulnerable to attack . . . because of faulty understanding and limited experience with such raw materials [themselves]."[3]

Instructional materials are arranged into activity centers or corners in designated areas of the classroom. The quantity and diversity of materials used in the open classroom frequently cause observers to think that activities

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[1]Featherstone, "The Primary School Revolution in Great Britain," p. 5.

[2]Dorothy Gardner and Joan Cass, The Role of the Teacher in the Infant and Nursery School (Oxford: Pergamon Press, 1965), p. 159.

[3]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 35.

Bushell, of the University of Kansas, concluded that students in more open projects such as those of various federal follow-through programs " . . . made impressive gains on such standardized measures as the Metropolitan Achievement Test."[1]

Open Education: A Theoretical Framework

Assumptions

In an effort to clarify or define open education, the question is often asked whether any "good" teacher can be classified as an open educationist. Literature associated with assumptions teachers have about knowledge and the process of learning seem to suggest that herein lies the major difference.

Many teachers may be able to meet the conventional criterion of "good teaching" by transmitting a body of knowledge which society thinks is worthwhile. Open educators, however, tend to reject the view of education as the transmission of a fixed body of knowledge.[2] Booth paraphrased Herbert Spencer's question (What knowledge is of most worth?") in a paper entitled "Is There Any Knowledge That A Man

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[1]"Open Education: The Results Begin To Come In," p. 69.

[2]Roland S. Barth, "Open Education and the American School," in The Open Classroom Reader, ed. by Charles F. Silberman (New York: Vintage Books, 1973), p. 266.

Must Have?"[1] He concluded his argument with the thought that while there is no set body of courses that all students need to master, they must be taught to think for themselves.[2]

Advocates of open education generally agree that the major purpose of education is to produce people who are able to educate themselves. Sir Alec Clegg is quoted by Silberman as saying the objective of education

> . . . is not so much to convey knowledge as it is to excite a determination in the child to acquire it for himself, and to teach him how to go about acquiring it.[3]

Piaget puts the argument in an even broader context. He says the goal of education

> . . . is to create men and women who are capable of doing new things, not simply of repeating what other generations have done--men and women who are creative, inventive, and discoverers

who

> . . . have minds which can be critical, can verify, and not accept everything they are offered.[3]

Open educationists tend to place more emphasis on the process of development than the end result. Childhood, in their view, is something to be valued in its own right,

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[1]Wayne C. Booth, "Is There Any Knowledge That a Man Must Have?" in The Open Classroom Reader, p. 92.

[2]Booth, "Is There Any Knowledge That a Man Must Have?", p. 102.

[3]Charles E. Silberman, The Open Classroom Reader, p. xix.

[4]David Elkind, "The Educational Implications of Piaget's Work," in The Open Classroom Reader, p. 196.

not merely as preparation for later life. "The best preparation for being a happy and useful man or woman," the Plowden Report maintains, "is to live fully as a child."[1] Barth's study,[2] and a subsequent article by him,[3] concur with the Plowden Report. He contends that

> . . . open education stresses the present, not the future; living, not preparing for life; learning now, not anticipating the future . . . . Development of self-reliance and independence . . . [is] the best assurance that [an individual] will be equipped for . . . the future.[4]

Similarly, Silberman views the role of open educators as one of helping children to become autonomous, self-motivated, and self-directed learners, rather than transmitters of culture, in which the purpose is to train people to fill the existing slots in society and the economy.[5]

Open educators do not make a distinction between work and play. The Plowden Report points out that " . . . play is the principal means of learning in early childhood . . . and

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[1]Lady B. Plowden, et al., Children and Their Primary Schools: A Report of the Central Advisory Council for Education (London: Her Majesty's Stationery Office, 1967), p. 188.

[2]Ronald Barth, "Open Education: Assumptions About Learning and Knowledge," (unpublished Doctoral dissertation, Harvard University, 1970), p. 106.

[3]Ronald Barth, "The Teacher As Facilitator of Learning," in The Open Classroom Reader, p. 286.

[4]Ibid.

[5]Charles E. Silberman, Crisis in the Classroom (New York: Random House, 1970), p. 232.

is therefore vital in school."[1] It further states that play is the way through which children reconcile their inner lives with external reality. Bremer and Bremer look upon play in the classroom as a means of bridging the communication gap between children and the teacher.[2]

Ability grouping is universally condemned by open educationists. Barth argues that ability grouping, more than any other educational practice, reveals one's underlying assumption about knowledge and children's learning.[3] He maintains that ability grouping is a logical extension of the transmission-of-knowledge model of learning. Open educators not only attempt to foster individual differences among children, but they also try to generate maximum interaction by forming heterogeneous groups (in terms of age, ability, sex, race and interest).

Teaching practices, also, serve as indicators of assumptions about the nature of knowledge and the learning process. While directive teaching is not completely abandoned in open classrooms, open classroom teachers are encouraged to use a didactic method only when appropriate. This appears to be consistent with Piaget's argument that " . . . much of our

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[1]The Plowden Report, "Children and Their Primary Schools," in The Open Classroom Reader, p. 143.

[2]Anne Bremer and John Bremer, Open Education: A Beginning (New York: Holt, Rinehart and Winston, 1972), p. 32.

[3]Barth, "Open Education and the American School," in The Open Classroom Reader, p. 268.

knowledge about reality comes to us not from without . . . but rather from within by the force of our own logic."[1] Piaget poses still another argument against the transmission-of-knowledge through "telling." "While the elementary child is indeed able to reason," he says, "his reasoning ability is limited in a very important respect--he can reason about things but not about verbal propositions."[2]

Provisioning

Piaget's idea about young children's ability to reason is taken seriously by British open educators as they attempt to provision the classroom. Provisioning refers to the teacher's responsibility for what's in the classroom and how it affects learning; e.g., the organization of time, grouping of children, promotion of climate, materials and equipment, and arrangement of furniture. The importance of this theme is indicated by the number of items included on the (OETQ). Twenty-five of the fifty items are concerned with the teacher's function of developing and arranging (provisioning) the physical environment. Bussis and Chittenden argue that it is

> . . . treated more extensively . . . primarily because [provisioning] is so central to an educational philosophy that stresses the importance of choice

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[1]Elkins, "The Educational Implications of Piaget's Work," in The Open Classroom Reader, p. 189.

[2]Ibid., p. 190.

> for children, and because it is an aspect of the teacher's role which affords many concrete examples.[1]

Their statement seems to support an assumption that was made in the above discussion: provisioning of the classroom reflects beliefs about children's learning and about the nature of knowledge.

Few open educators believe that the open approach can be implemented with the conventional time schedules which separate subject matter. Sargent appears to place more confidence in the initiative of children than most open educators. He argues for a highly flexible schedule which allows each student to plan a schedule which best suits his needs.[2] According to Brown and Precious, the child should be given freedom to choose the things he wants to become involved in without the " . . . parcelling out of time, or directing groups of children to different activities."[3]

Cazden's idea of time utilization is somewhat different from the above alternatives. He thinks the school day should have definite time expectations for children to engage in reading, writing, and mathematics with each child being responsible for selecting the form of his work, and the

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[1]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 37.

[2]Betsye Sargent, The Integrated Day in an American School (Boston: National Association of Independent Schools, 1970), p. 3.

[3]Mary Brown and N. Precious, The Integrated Day in the Primary School (New York: Agathon Press, 1969), p. 17.

time for doing it.[1] Silberman's position on the use of time seems to be closer to that of Sargent, Brown, and Precious. He thinks the day should be

> . . . divided into large blocks of time (rather than a rigid time table) where children under the teacher's supervision, engage individually or in small groups in a wide variety of activities.[2]

The grouping of children in open classrooms differs from the conventional practice of grouping. Armington points out that " . . . learning is frequently a cooperative enterprise marked by dialogue."[3] Using this assumption as a rationale, Featherstone advocates a family or vertical grouping arrangement of children where there is no grouping by ability or age. He says that since children learn from each other, there should be a mixture of slow children and bright children in every class.[4] The point has been made that open educators oppose the practice of ability grouping. Barth maintains that teachers who practice this form of grouping show little respect for children as individuals.[5]

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[1]Courtney B. Cazden, Language Programs for Young Children: Notes from England and Wales (Urbana: University of Illinois Press, 1970), p. 11.

[2]Charles E. Silberman, Crisis in the Classroom (New York: Random House, 1970), p. 209.

[3]D. E. Armington, A Plan for Continuing Growth, Proposal submitted to United States Office of Education, December, 1968, p. 7.

[4]Joseph Featherstone, "The Primary School Revolution in Great Britain," The New Republic (Washington, D. C., August 10, September 2, September 9, 1969), p. 15.

[5]Barth, "Open Education: Assumptions About Learning and Knowledge," p. 77.

Hawkins enunciates Martin Buber's concept of the "I-Thou-It" relationship.[1] In his view of provisioning the learning environment, a triangular relationship is formed in which the child (I) becomes involved with concrete materials (It), and the teacher (Thou) shares his involvement, so that "I-Thou" becomes "We" confronting "It."[2] Hawkins describes the teacher's role in the relationship as being that of an "external loop" which gives selective feedback to the child as the child interacts with materials.[3]

George Leonard, one of those to whom open educators look for direction in the affective dimension, places more emphasis on "hardware" than most open educationists are comfortable with. In his book Education and Ecstasy, technology is servant to man rather than an agent to depersonalization (a fear of open educators). He makes the point that

> . . . modern science and technology seem to be preparing a situation where the successful control of practical matters and the attainment of ecstasy can safely coexist.

Leonard goes on to say " . . . [ecstasy and technology] reinforce each other . . . and neither can long exist without

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[1]Maurice Friedman, "The Existential Man: Buber," The Educated Man: Studies in the History of Educational Thought, ed. by Paul Nash, et al. (New York: John Wiley and Sons, Inc., 1967), pp. 363-87.

[2]David Hawkins, "The Triangular Relationship of Teacher, Student, and Materials," in The Open Classroom Reader, p. 364.

[3]Ibid., p. 366.

the other."[1]

Rathbone's idea of material utilization, unlike Leonard's, is more typical of the way materials are used in British open schools. He says that teachers of British open classrooms tend to favor raw materials and the " . . . inclusive of scrounged junk."[2] His comments seem to indicate that British children are encouraged to introduce, within reason, whatever materials they wish to have in open classrooms. While supporting the use of natural and homemade materials in open classrooms, the EDC has compiled an extensive list of materials (The EDC guidelines), most of which are commercially obtained.[3]

Prescott and Raoul point out that the open classroom environment changes many times during the course of a given year.[4] While a high density of materials is generally maintained, according to Barth " . . . there is a correspondingly low incidence of outright duplication."[5] Among these materials

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[1]George Leonard, Education and Ecstasy (New York: Dell, 1968), p. 17.

[2]Charles Rathbone, "Open Education and the Teacher," (unpublished Doctoral dissertation, Harvard University, 1970), p. 48.

[3]Instructional Aids, Materials, and Supplies - Guidelines, rev. 1972 (Newton, Massachusetts: Education Development Center, Follow Through Program, April, 1971).

[4]Jane Prescott and Kathleen Raoul, "Live and Learn," Shady Hill News (Cambridge, Massachusetts, Fall, 1970), p. 8.

[5]Barth, "Open Education: Assumptions About Learning and Knowledge," p. 46.

are purchased apparatus and a wealth of "homemade" and raw materials for all types of work. Featherstone observed that " . . . in good infant schools, there are no textbooks and no class readers." He says books at all levels of difficulty are provided, many of which are single books.[1] Materials and reference books, Gardner and Cass point out, are made easily available on shelves or tables around the classroom.[2]

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[1]Featherstone, "The Primary School Revolution in Great Britain," p. 5.

[2]Dorothy Gardner and Joan Cass, The Role of the Teacher in the Infant and Nursery School (Oxford: Pergamon Press, 1965), p. 159.

[3]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 35.

are casual and spontaneous. "What often appears to be spontaneous," says Silberman, "is the result of careful planning on the part of the teacher."[1] He believes that since teachers select much of the materials they are, in a sense, structuring learning experiences.

Instruction

There are only five items on the (OETQ) concerned with instruction. Items of this area refer to the way teachers direct and respond in the classroom. Teachers in open schools generally resort to two types of horizontal school organization: self-contained classrooms and team teaching.

Many American open schools have initiated some form of team teaching in an effort to implement an open education program. Whereas educators in the United States have attempted to formally organize teachers into teams, British educators seem to depend more upon teachers to initiate the consolidation of their own capabilities. To do otherwise, they claim, is to become involved in a gimmick.[2]

Much of the teacher's instructional behavior in the

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[1]Silberman, The Open Classroom Reader, p. 247.

[2]While none of the teachers of this study referred to team teaching as a gimmick, many of them alluded to the problems involved. The investigator inferred from their comments that team teaching had become an end, rather than a way of spreading the resources of the staff and stimulating teachers' professional growth.

open classroom falls under the category of diagnosis. Kohl contends that " . . . the teacher becomes diagnostically involved with each child so as to extend his interests and activities . . . ."[1] Quoting a British primary teacher, Featherstone says, " . . . I can give all of my attention to a child for five minutes, and that's worth more to him than being part of a sea of faces all day."[2] In reference to a specific open classroom teacher, Gardner and Cass observed that when she

> . . . gave her attention to a child or a group of children, she gave it very fully and appeared at leisure to carry on a really long and . . . complete conversation.[3]

That children must discover facts for themselves in their own time is an assumption held by many open educators. However, discovery will not be forthcoming unless " . . . relevant material is available . . . in sufficient quantity and variety . . ."[4] and the teacher, through constant diagnosis, is able to assist in the passage from one stage to the next.

Reporting on visits to British primary schools,

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[1]Herbert R. Kohl, The Open Classroom (New York: Random House, 1969), p. 99.

[2]Featherstone, "The Primary School Revolution in Great Britain," p. 6.

[3]Dorothy Gardner and Joan Cass, The Role of the Teacher in the Infant and Nursery School, p. 162.

[4]John Blackie, Inside the Primary School (London: Her Majesty's Stationery Office, 1967), p. 87.

Featherstone says that in early stages of the open classroom approach " . . . some teachers thought . . . children could learn from a stimulating environment without the help of a teacher."[1] This erroneous perception of the teaching-learning process caused experts in the field to emphasize the notion that there must be active and responsible teaching in open classrooms. The activist teacher, according to Bussis and Chittenden, is an " . . . active influential adult . . . who can offer suggestions, introduce materials, [ask experience-based question], and demonstrate ways of doing things."[2]

British open schools include the arts in the total curriculum. Featherstone refers to the arts as a " . . . paradigm [to the] whole approach to children's learning."[3] He thinks various arts are alternate ways of knowing and communicating, and to become competent in them will spill over into other areas.

Many open educators reject the conventional practice of planning lessons weeks in advance and timetables that rigidly divide the curriculum. Kohl points out that

> . . . to plan intelligently, the teacher must observe the class and assess what is happening: who is interested in what, who isn't, and what directions the

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[1]Joseph Featherstone, Informal Schools in Britain Today: An Introduction (New York: Citation Press, 1971), p. 30.

[2]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 49.

[3]Featherstone, Informal Schools in Britain Today: An Introduction, p. 29.

students are moving in.[1]

There are several rationales implicit in this instructional approach. First, children's involvement and not the teacher's predetermined plans should be the dominating factor in planning instruction. Secondly, children should be taught skills for the purpose of solving problems which they have initiated, rather than as ends in themselves. Thirdly, teachers should start with children's experience and move toward teacher goals. Finally, teachers and children should cooperate in planning their work.

Brown and Precious maintain that timetables and rigid divisions of the curriculum give children an artificial perception of schooling and, therefore, " . . . tend to interrupt children's train of thought and interest."[2] Rathbone feels that a teacher can have " . . . definite expectations concerning a student's learning . . . and not press for any particular yearly, monthly, or daily time schedule . . . ."[3] In opposition to the division of subjects, Armington says " . . . there are few obvious barriers between subjects, and much of the children's work is, in fact, interdisciplinary."[4]

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[1]Kohl, The Open Classroom, p. 59.

[2]Brown and Precious, The Integrated Day in the Primary School, p. 57.

[3]Rathbone, "Open Education and the Teacher," p. 51.

[4]Armington, "A Plan for Continuing Growth," p. 7.

Diagnosis

Characteristics of instruction in the open classroom seem to suggest that diagnosis precedes teaching (instruction). Diagnosis refers to the teacher as a sensitive onlooker or a participating observer.

Bussis and Chittenden report that diagnostic information should provide the child with opportunities for growth, and the teacher with an opportunity to learn about that child.[1] Walberg and Thomas stress the same idea in their research.[2] Arguing for the children's participation, Barth contrasts the open approach with conventional methods of assessment " . . . in which children have little responsibility and opportunity for participating in the assessment of their work."[3] He further contends that after the first few days of speculative provisioning of the learning environment, the teacher is guided less on "hunch" and more on each child's exploration.[4] Brown and Precious make the same point by saying that as the teacher observes children exploring materials in problem-solving situations, she acquires

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[1]Bussis and Chittenden, Analysis of An Approach to Open Education, p. 38.

[2]Walberg and Thomas, Characteristics of Open Education: A Look at the Literature for Teachers, p. 7.

[3]Barth, Open Education: Assumptions About Learning and Knowledge, p. 38.

[4]Barth, "The Teacher As Facilitator of Learning," The Open Classroom Reader, p. 277.

information that guides her planning.[1]

The four items on the (OETQ) concerned with diagnosis center around active teacher involvement, observation, and record keeping. Teachers must elicit information about the development of children from day to day and respond to them on the basis of what she learns. Teachers acquire this information by being actively involved in what children are doing.[2] In the context of involvement, Featherstone argues, " . . . teachers can get more information about what children know by observing them as they work and asking questions, than the more [conventional] means of testing."[3] A similar position is taken by Barth in his statement that " . . . teachers can recognize and share the child's cognitive and emotional investment in his work by getting involved with him."[4]

Open educators tend to look upon student mistakes as a normal, non-reprehensible part of the learning process. Rathbone believes that if teachers have this attitude regarding mistakes " . . . they can contribute greatly to the

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[1]Brown and Precious, The Integrated Day in the Primary School, p. 18.

[2]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 38.

[3]Featherstone, The Primary School in Britain, p. 6.

[4]Barth, Open Education: Assumptions About Learning and Knowledge, p. 114.

psychological climate."[1] In describing a measurement activity of a child, Holt observed that as the child struggled toward the solution, the child had no idea that he was making mistakes. Holt further says

> . . . in his own clumsy way, [the child] was doing a piece of research . . . and without having to be told so, he saw that every unsuccessful attempt brought him closer to the answer he sought.[2]

Evaluation

Diagnosis and evaluation are inseparable, and both are essential to provisioning the learning environment and instructing children. Contrary to popular belief that evaluation in open classrooms is haphazard, children are constantly evaluated and record keeping is an important part of the teacher's work. Silberman reports instructional activities in North Dakota open classrooms in which testing is used, but " . . . youngsters sign up to be tested as each feels prepared."[3] This technique seems to avoid Whitehead's argument that " . . . uniform external testing is too deadly,"[4] and is inconsistent with what is known about the process of learning.

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[1]Rathbone, Open Education and the Teacher, p. 89.

[2]Holt, How Children Learn, pp. 114-15.

[3]Arlene Silberman, "Excitement in North Dakota," The Open Classroom Reader, p. 44.

[4]Alfred North Whitehead, "The Acquisition of the Art of the Utilization of Knowledge," The Open Classroom Reader, p. 119.

To open educators the purposes of evaluation center around its usefulness to the child, and its usefulness to the teacher in attempting to help the child. "Evaluation in the open school," in Barth's view, "is primarily for the benefit of the learner and only secondarily for the benefit of parents, teachers, or the administrator."[1] "External incentives such as marks" according to the Plowden Report, "influence children's learning mainly by representing parents' or teachers' approval . . . . Children who most need the incentive of good marks are least likely to gain them."[2] Featherstone suggests that if Americans could see detailed histories kept on each child's separate progress " . . . they would feel, quite rightly, that a report card is a swindle."[3]

Featherstone's quote should not be interpreted to mean that the British open educator's approach to evaluation is a panacea. He admits that in some cases British practitioners operate out of what seems to be romanticism. While conducting their investigation of British and American open schools, Bussis and Chittenden reported that teachers seemed to ". . . fluctuate between vague 'romantic' terms and

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[1]Barth, Open Education: Assumptions About Learning and Knowledge, p. 112.

[2]Lady B. Plowden, et al. Children and Their Primary Schools: A Report of the Central Advisory Council for Education (London: Her Majesty's Stationery Office, 1967), p. 196.

[3]Featherstone, "The Primary School Revolution in Great Britain," The New Republic, p. 6.

'trivial' concreteness, when pressed for objectives."[1]

In analyzing the curriculum organization and the values of open educators, one may conclude that the activities do not lend themselves to the specification of objectives. Open education literature is replete with examples of how the arts permeate the curriculum of open classrooms. The difficulty involved in establishing a predetermined "yardstick" or norms for the arts may be one reason open educators join other critics in opposing the use of instructional objectives.

If open educators are looking for more "scientific" ways of measuring student progress, as Bussis and Chittenden suggest, the use of expressive objectives may be an alternative.[2] Unlike behavioral objectives, which specify or predict the outcome in measurable terms, expressive objectives place emphasis on the experience encountered. Where schools are faced with accountability laws, evaluative techniques of open classrooms may take the form of "criterion-referenced" measures. This concept seems to address itself to the acquisition of competencies without the use of norms or comparing a child's performance with other children in the classroom.[3]

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[1]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 3.

[2]Ibid.

[3]W. Robert Houston, et al., Developing Instructional Modules (Houston, Texas: University of Houston, 1971), p. 76.

Humaneness

John Dewey said, "It is necessary to prepare the coming generation for a new and more just and humane society which is sure to come . . . ."[1] Dewey goes on to point out the adverse effects on society unless "hearts and minds" are prepared by education. Featherstone alludes to a need for American schools to liberalize the repressive atmosphere, but warns that there is also a need for " . . . a steady concern for intellectual progress and workmanship."[2]

Open educators look to teachers as the primary agents for helping schools to become more humane. In their opinion the humane teacher is characterized by respect for the individual, honesty, and warmth. These characteristics are demonstrated by praise or positive reinforcement of children's behavior, the teacher's honest admission of limitations, and setting up a psychological climate in which children feel free to go to her for assistance in handling difficult aspects of their emotional life.[3]

Brown and Precious maintain " . . . if the teacher does not know [the answer to a question], it is better to be honest and admit it, but suggest a way that they could both

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[1]John Dewey, "Education As Growth," The Open Classroom Reader, p. 127.

[2]Joseph Featherstone, "A Unified Approach to Learning," The Open Classroom Reader, p. 138.

[3]Bussis and Chittenden. Analysis of an Approach to Open Education, p. 44.

find out."[1] In Rathbone's view the open classroom is an environment of "trust" and "openness." He writes:

> . . . the open classroom is a place of trust and openness, where interpersonal defensiveness has nearly disappeared, where expression of feeling is encouraged by others and accepted by the group. Feelings are aired as inhibitions are loosened, and people become more receptive to honest observations of themselves, their own motives and the behavior and motives of others . . .[2]

In Barth's view it is not only desirable, from the adult's point of view, to behave openly with children, it is essential from the child's point of view. "Prompt expression of annoyance and anger towards a disruptive child," according to Barth, "is essential for both teacher and child, and the establishment of their relationship."[3] Barth contends that teachers of open classrooms are more likely to operate on the principle, "I can trust this child until he gives me reasons not to, and then I will be more cautious about trusting him . . . in that particular area," than on the principle, "I can't trust any child until he gives me ample evidence that he deserves to be trusted."[4]

Affective educators (from whom open educators draw)

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[1]Brown and Precious, The Integrated Day in the Primary School, p. 31.

[2]Rathbone, Open Education and the Teacher, p. 87.

[3]Barth, Open Education: Assumptions About Learning and Knowledge, p. 69.

[4]Ronald S. Barth, "The Sources of Pleasure," in The Open Classroom Reader, pp. 175-76.

are attempting to humanize the curriculum by balancing the conventional emphasis on skills and cognitive information with explicit attention to the area of feelings, values, and interpersonal behavior.[1] In his book Reach, Touch and Teach, Barton has proposed a number of techniques designed to help teachers and students explore and recognize their own and each other's feelings.

Dennison's proposal for humanizing education appears to be more radical than the one advanced by Barton. He says:

> . . . the school environment should and can be controlled . . . if we were to take as our concern not the instruction of . . . children, but the lives . . . of children . . . [and] cease thinking of a school as a place, and learn to believe that it is basically relationships: between children and adults, children and other children.[2]

Leonard goes a step further and suggests the elimination of educational institutions. He thinks that everything which is presently being accomplished in schools can be accomplished more effectively and with less pain in the average child's home or neighborhood playground. Quoting M. W. Sullivan, an educational programmer, Leonard says,

> In the entire psychological literature, you can find no evidence that the teacher per se helps learning . . . . Schools as they now exist are well-designed to produce unhappiness and little else . . . [they are] cruel, unnatural, [and] unnecessary.[3]

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[1]Terry Barton, Reach, Touch and Teach: Student Concerns and Process Education (New York: McGraw-Hill, 1970) p. 135.

[2]George Dennison, The Lives of Children: The Story of the First Street School (New York: Random House, 1969), pp. 6-7.

[3]Leonard, Education and Ecstasy, pp. 102-06.

Leonard's ideas about the elimination of schools appear to be a reaction to the repressive techniques and the lack of "free learning" in many schools. While open educators support Leonard's argument for "ecstasy" in education and his indictment of conventional methods in education, they reject the notion of eliminating schools. For them, if teachers adhere to previously discussed open education characteristics (of Assumptions, Provisioning, Instruction, Diagnosis, Evaluation and Humaneness), in which the learner is respected and is enabled to become self-reliant, schools will become more humane places for children.

Seeking

Seeking refers to teachers recognizing opportunities to promote personal growth and making use of it.[1] Involvement in workshops, educational courses, and observation of other teachers all play a significant role in teacher growth. Ongoing communication among teachers in sharing ideas (from reading and experience), and observations about children and learning are also vitally important to teachers' personal growth.

If one accepts the argument that exchange of ideas about teaching and learning among colleagues contribute

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[1]Walberg and Thomas, Characteristics of Open Education: A Look at the Literature for Teachers, p. 9.

to personal growth it could then, be argued that certain kinds of space and teacher arrangements will enhance opportunities for communication. Advocates of team teaching and open space schools believe that through these administrative arrangements communication among professionals is encouraged.[1] Such arrangements tend to prevent teachers from working in isolation (at least physically), and frequently stimulate new ideas and insights.

Continuous search and exploration of instructional materials is essential for the open classroom teacher. Open educators are in agreement with the concept of utilizing the community as a source for acquiring instructional materials,[2] and information about children.[3] There is also agreement in the belief that teaching is an opportunity for teachers to personally and professionally grow. Richardson writes:

> For what I myself learned during these years I have mainly my children to thank. They were my teacher as I was theirs, and the basis of our relationship was sincerity, without which, I am convinced, there can be no creative education.[4]

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[1]Bussis and Chittenden, Analysis of an Approach to Open Education, p. 42.

[2]Featherstone, "The Primary School Revolution in Great Britain," p. 15.

[3]L. M. Howard, The Developmental Classroom (Boston: Office of Program Development (unpublished mimeograph)), 1968, p. 12.

[4]E. S. Richardson, In the Early World (New York: Random House, 1964), p. xiii.

Self-Perception

Self-perception intertwines with the six other themes by supporting and sustaining classroom practices. "The teacher's self-perception," Walberg and Thomas contend, "enables her to formulate and act upon her convictions about children and education."[1]

Open classroom teachers tend to view themselves and their roles differently than conventional self-contained teachers. The teacher in the open school, Barth maintains, views herself as a facilitator of learning rather than a transmitter of knowledge.[2]

Walberg and Thomas argue that open classroom teachers have two characteristics which distinguish them from the perception other teachers have of themselves and their role: (1) a complete understanding of their changing role (from transmitter of knowledge to facilitator), and (2) the conviction within themselves that what they are doing is right.[3] While some conventional teachers may share the same belief, it seems to be the willingness to attempt to carry the implications through in the classroom that characterizes the open classroom teacher.

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[1]Walberg and Thomas, Characteristics of Open Education: A Look at the Literature for Teachers, p. 10.

[2]Barth, Open Education: Assumptions About Learning and Knowledge, p. 70.

[3]Walberg and Thomas, Characteristics of Open Education: A Look at the Literature for Teachers, p. 10.

Finally, the perception open classroom teachers are expected to assume of themselves and children appear to parallel the view transactional analysts have for a positive self-perception and interpersonal relationships. In relating to children, the teacher must do so from the point of view of the "I'm OK-You're OK" life position,[1] and the child was "Born To Win."[2] Stated differently, the open classroom teacher has a good feeling about her own worth and she believes each child is born as something new, and someone who never existed before. Further, each child is viewed as having his own unique potential with capabilities and limitations.

Summary

Review of the literature is concerned with the findings of alternative educational programs as they have been compared with the conventional method of schooling, and a review of literature which addresses itself to the eight themes of the open education theoretical framework. Many studies have shown a lack of statistical significance between innovative programs and the conventional program. However, several studies included in this chapter have shown differences favoring the novel programs.

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[1]Thomas A. Harris, I'm OK-You're OK (New York: Harper and Row, 1969), p. 50.

[2]Muriel James and Dorothy Joneward, Born to Win: Transactional Analysis with Gestalt Experiments (Menlo Park, California: Addison-Wesley Publishing Company, 1971), p. 1.

Open education, as defined by developers of the (OETQ), consists of eight themes or basic components: (1) assumptions about learning and knowledge, (2) provisioning the learning environment, (3) instruction or guiding and extension of learning, (4) diagnosis of learning events, (5) reflective evaluation of diagnostic information, (6) humaneness or respect, openness and warmth, (7) seeking opportunities to promote growth, and (8) self-perception or the teacher's view of herself and her role.

While the eight themes are interrelated, assumptions about learning and knowledge appear to influence and determine perceptions teachers have of the other themes. Open classroom teachers tend to equip the learning environment with a wide range of manipulative and common environmental materials. Believing that learning takes place from one's own initiative through exploration and discovery, open classroom teachers perceive their role as that of an active facilitator, and they encourage children to be active learners.

Diagnosing learning events in open classrooms is a process of observation, listening to children, and asking experience-based questions. From information received through active teacher involvement and record keeping, open educationists are able to chart individual student progress.

Drawing from the work of affective educators, teachers in open classrooms are encouraged to respect

children as individuals and to relate to them in a warm and open manner. Feelings, values, and interpersonal behavior seem to be as important in open classrooms as the cognitive dimension.

Unlike conventional teachers, open educationists rely upon the community and its resources in seeking information about children and opportunities for professional and personal growth. Realizing that open space and team teaching may enhance professional growth and encourage communication, open educators look upon these administrative arrangements as extensions of open education rather than essentials.

Open classroom teachers perceive their role as one of facilitating learning as opposed to the traditional notion of transmitting a predetermined body of knowledge. They are distinguished from their conventional counterparts by their willingness to carry this implication through in the classroom. Essentials of open education are as follows: personalization of instruction, integration of curriculum, flexible time schedules, and the integration of work and play.

CHAPTER III

METHODS AND PROCEDURE

Statistical Techniques Utilized

The statistical method of multivariate analysis used in investigating the problem was a Discriminant Analysis for two groups (BMDO7M). The utlimate use of this statistical technique was to predict group membership.

As previously stated openness was operationally defined by the total score on the (OETQ). The Open Education Teacher Questionnaire (OETQ) was used to establish classroom openness. From results of the OETQ, open and conventional groups were formed.

Determining degrees of classroom openness was not the primary function of this study. Teachers who scored above the median on the OETQ were classified as "derived" open classroom teachers, and those scoring below the median were classified as "derived" conventional classroom teachers. In an effort to generate more information about the open and conventional groups, each group was subdivided; thereby forming four for the teacher sample. Thus, categories became more conventional, conventional, open, and more open for the first, second, third, and fourth quartiles, respectively. Comparison of the first and fourth groups, in addition to the groups established by the median, was an

attempt to secure more information about student misclassification.

Students were assigned to the group in which their teacher was a member, e.g., conventional or open; or more conventional, conventional, open, or more open. From the empirical grouping of students, scores were obtained on the environmental variables derived from the My Class Inventory (MCI) and the cognitive variables measured by the Metropolitan Achievement Test (MAT). The computer program analyzed data in an effort to identify some composite set of dependent variables which maximally described differences between students of open and conventional classrooms.

A major test of this study is checking to see if open classrooms are significantly different from conventional classrooms in terms of some combination of dependent variables. The function of the multivariate technique was to analyze dependent variables as a set. The program sought information of how the learning environment (as perceived by students) and achievement influence each other, and to explain within group variance and between group variance. Essentially, the investigation tried to find, on the basis of dependent variables, some correlated set that worked together to explain more group variation than any other combination.

Overall and Klett say that by assigning appropriate weighting coefficients, several scores can be transformed to a single score which has maximum potential for distinguishing between members of two groups. By using this process,

the multivariate problem is actually reduced to a single univariate problem, and assignment of individuals between the groups depends upon the value of a single vector variable.[1]

In addition to considering each dependent variable as a linear function, the program manipulated a mathematical equation and arrived at an overall mean for all of them. A geometric interpretation of the open and conventional groups may be thought of as forming two ellipses, with the mean of the dependent variables representing a centroid for each group. In a multivariate sense the upper and lower portions of the ellipses come to points at which they overlap. This area represents the mean of the two groups. The overlap or the points at which the ellipses cross can be thought of as the function between the two groups.[2]

Misclassification of the students results from the overlap of the ellipses. The program attempts to move the two means as far apart as possible so that the overlap is minimal. However, when overlap does occur, the program reduces it by forming a line through the points at which the ellipses cross.

Students are assigned to a group mean to which they are closest. A student may be closer to the mean of group

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[1]John E. Overall and C. James Klett, Applied Multivariate Analysis (New York: McGraw-Hill Company, 1972), p. 243.

[2]William W. Cooley and Paul R. Lohnes, Multivariate Data Analysis (New York: John Wiley and Sons, Inc., 1971), p. 245.

one, but is in fact a member of group two. This function takes place within the area of overlap and the computer program identifies him as being misclassified.

Basically, this statistical technique examines the centroids of the two groups. This area represents the misclassified students, and the study predicted that a given percentage of them would be properly classified. The probability of error is specified in the same manner as is the statistical significance of such univariate statistics as r or t. The computer program provided the test statistic and the degrees of freedom associated with it. The multivariate significant value is compared with the value recorded in a regular F table.

Population and Sample

The population from which the sample was drawn consisted of fifty-seven kindergarten through fourth grade schools and two kindergarten through fifth grade schools of the Oklahoma City Independent School District. Ten open-space and modified-space schools were randomly selected from the district's twenty open architecturally designed schools. Fifteen of the thirty-nine schools of conventional architectural design were randomly drawn.

One teacher and her class were randomly drawn from each school's teacher-roster. First grade treachers and teachers with less than one year experience in the school design in question were excluded from the study. An alternate

teacher, from each of the twenty-four schools, was also drawn. If the first teacher failed to meet the study's qualifications, or chose not to participate, she was replaced by the alternate teacher. Thus, the sample consisted of twenty-four elementary schools comprising twenty-nine teachers, and five hundred seventy students. The sample includes second, third, and fourth grade students only. Classes for gifted children, and the educationally mentally retarded children were not included in the study.

Procedure for Collection of Data

Following the approval of an application to the Research Department of the Oklahoma City School District to perform the investigation, Dr. Ron Schnee and the investigator randomly selected the schools and teachers that were to be involved in the study. One teacher and an alternate were randomly drawn from the school-roster of each of the twenty-five schools selected. The Research Department sent a memorandum to the twenty-five schools informing each principal that his school, one teacher and her class, and an alternate teacher and her class, had been randomly selected to participate in the study. The alternate teacher's involvement in the study was dependent upon whether the first teacher met the qualifications specified by the study. Only one alternate teacher was needed to replace the first selection.

The memorandum informed principals that the decision

for their schools to participate in the study was their option. One principal declined participation of his school.

In an effort to increase the teacher-student sample, the investigator requested permission from the selected principals for the involvement of additional teachers and their classes. Five principals consented to the request, thus increasing the teacher-student sample to twenty-nine classrooms as compared to twenty-four schools. As would be expected in a random process, all geographic, social, and economic areas within the school district are represented in the sample.

Following the memorandum from Dr. Schnee to principals, the investigator discussed a tentative schedule for the collection of data with each principal. During the discussion, more details were given as to the nature of the study and the procedure that would be used for collecting the data.

One visit was made to each school, at which time a separate conference was held with the principal and the teacher. The teacher was asked to respond to the (OETQ) in terms of what was happening in the classroom, rather than what she thought should be happening. The (OETQ) was administered to all teachers of the sample (nominal open and nominal conventional). Teachers scoring above the median on the 50-item questionnaire were assigned to the derived open classroom category. Teachers scoring below the median on the questionnaire were categorized as derived conventional classroom teachers. The derived open and conventional

categories were further subdivided, resulting in quartiles for the teacher categories.

As the teacher completed her instrument, the investigator administered the (MCI) to students. Instructions for responding to the (MCI) items were read to the students, as was each item of the instrument. This process was used in an effort to overcome lack of understanding of item concepts due to poor reading skills which some students may have been experiencing.

The teacher and student instruments were collected before leaving the school. While in the classroom, the investigator wrote a brief report on provisions of the classroom, e.g., arrangement of furniture, diversity of materials and equipment, and grouping of students. Information from the report was compared with the teacher's responses to the twenty-five test items concerned with provisioning (see results in Chapter V). Data from the (MCI) and the (OETQ) were gathered over a six-week period during the months of March and April, 1974.

The Metropolitan Achievement Test was administered to second, third, and fourth grade students by their teachers during the months of March, April, and May, 1974. Data were sent to the Research Department of the school district to be analyzed by a computer program. Results were recorded from the computer printout, by the investigator, in August, 1974.

Independent Variables

Open and conventional environments as perceived by teachers are the independent variables. The (OETQ) was used to establish criteria for teacher environments and subsequently to form two groups: open and conventional.

Teachers who scored above the median on the (OETQ) were classified into the "derived" open classroom group. Teachers who scored below the median were classified into the "derived" conventional classroom group.

Dependent Variables

The learning environment (student perception), reading achievement, and mathematics achievement were the dependent variables. The learning environment was measured by the (MCI). Reading and mathematics achievement were measured by the Metropolitan Achievement Test (MAT).

Instrumentation

The Open Education Teacher Questionnaire (OETQ) is an eight-dimension, 50-item instrument which was developed by Walberg and Thomas.[1] The questionnaire format has a 4-point (strongly disagree, disagree, agree, strongly agree) organization.

Bussis and Chittenden identified ten distinctive themes of open education from interviews with teachers of

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[1]Walberg and Thomas, American Educational Research Journal, 9 (1972), 199.

the movement.[1] These themes were transformed and reduced to eight as a result of extensive research supported by the Educational Development Center of TDR Associates, Inc., under a U. S. Office of Education grant. Walberg and Thomas are convinced that the eight themes will distinguish open from conventional education.[2]

The theoretical framework of the open education instrument is based upon the following eight themes:

1. Instruction--guidance and extension of learning.
2. Provisioning--provisioning the class for learning.
3. Diagnosis--diagnosis of learning events.
4. Evaluation--reflective evaluation of diagnostic information.
5. Humaneness--respect, openness, and warmth.
6. Seeking--seeking opportunities to promote growth.
7. Self-perception--the teacher's view of herself and her role.
8. Assumptions--ideas about children and the process of learning.[3]

Validation of the instrument resulted from a content analysis of open education literature, and was verified by

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[1]Anne M. Bussis and Edward Chittenden, "Toward Clarifying the Teacher's Role," Open Education: A Sourcebook for Parents and Teachers, ed. by Edward B. Nyquist and Gene Hawes (New York: Bantam Books, Inc., 1972), p. 119.

[2]Walberg and Thomas, Characteristics of Open Education: A Look at the Literature for Teachers, p. 5.

[3]Ibid., pp. 3-11.

29 nationally prominent educators in the field. The survey involved authors in each of the following categories: Practitioners, Advisors and Advocates, Observers and Reporters, and Researchers and Analysts.

Using the above paradigm as a guide, 106 specific statements were drafted based on quotations defining open education characteristics. Following reactions from twenty-nine authorities in open education, the original list was revised, and 50 items were selected for inclusion on the teacher questionnaire.

The following is a breakdown of items represented on the questionnaire:

Theme	Number of Items
1. Provisioning	25
2. Humaneness	4
3. Diagnosis	4
4. Instruction	5
5. Evaluation	5
6. Seeking	2
7. Self-perception	1
8. Assumptions	4

The developers of the (OETQ) established reliability by Chronbach's Alpha for internal consistency. A correlational analysis revealed that, six of the eight scales had correlations ranging from .42 to .81. Assumptions and seeking had

correlations of .11 and .18, respectively. Rating difficulty of these two scales by observers and acquiescent response bias by teachers were given as possible reasons for low correlations.

The My Class Inventory (MCI) contains 45 items distributed over the scales Satisfaction, Friction, Competitiveness, Difficulty, and Cohesiveness. It parallels the Learning Environment Inventory which was developed for the secondary level. Children are to agree or disagree with each item.

Based upon Chronbach's Alpha, individual scale reliabilities ranged from .54 to .77. To insure homogeneity of content, a draft of the individual items was prepared and four independent judges classified the items into scale groups. Each judge was provided with two sample items considered indicative of the presumed scale groups.[1]

Cohesiveness has been found to contribute to increased learning if the group norm includes learning. For nonlearning-oriented classes, cohesiveness tends to act against those pupils who want to learn.[2]

Difficulty scores are highly related to measures of cognitive learning with pupils generally learning most in classes perceived as the most difficult. Class size is also

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[1]Gary J. Anderson, The Assessment of Learning Environments: A Manual for the Learning Environment Inventory and the My Class Inventory (Atlantic Institute of Education, Halifax, Nova Scotia, Canada, 1973), pp. 4-13.

[2]Ibid., p. 11.

related to learning. Anderson found that larger classes were perceived as less difficult than small ones.[1]

Satisfaction is negatively related to class size and differs with the nature and type of class. Anderson contends that if students dislike the subject, the teacher, or their classmates their frustration may result in less than optimal performance.[2]

Friction is believed to relate negatively to learning. The more formal, fast-moving and difficult classes tend to have a higher level of friction.[3]

Competitiveness varies with the nature and type of class. Student composition also has an effect on the level of classroom competition. Anderson cites a study by Randhawa and Michayluk which reported higher levels of competitiveness in rural classrooms than urban classrooms in Western Canada.[4]

Treatment of the Data

Twenty-nine classrooms involving five hundred seventy students comprised the sample. Student data consisted of (MCI) scale values, and reading and mathematics achievement as

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[1]Anderson, The Assessment of Learning Environments: A Manual for the Learning Environment Inventory and the My Class Inventory, p. 12.

[2]Ibid., p. 13.

[3]Ibid., p. 17.

[4]Ibid., p. 13.

measured by the Metropolitan Achievement Test. Students were classified as operating in open or conventional classrooms based upon their teachers' (OETQ) results.

With the use of a multivariate analysis computer program, the Discriminant Analysis for two groups (BMD07M), dependent variables were analyzed as a linear function in an effort to discriminate between open and conventional classrooms. Following this process, the program attempted to find some composite set of dependent variables which would maximally discriminate between the independent variables (open and conventional classrooms).

Comparison of student data was first performed between the two groups which were determined by the median teacher score of the (OETQ). The two groups were further subdivided, resulting in four groups for teachers and their students. Values of (MCI) scales and (MAT) scores of students in the extreme upper group (more open) were compared with data of students in the extreme lower group (more conventional).

The program gave prior probabilities for correct classification of students as 0.500 for each function. Degrees of freedom were given for each variable or set of variables. Values were then compared with values in the F table. The computer program further analyzed individual student data, assigned the student to the open or conventional group, and gave the number of students properly classified and misclassified for each of the two groups. Group means,

grand means, and standard deviations were included in the computer printout.

Cooley and Lohnes offer a geometric interpretation of discriminant analysis (see Figure II) that illustrates the process used in classifying students into open and conventional classrooms.[1] The computer program classified students by manipulating this equation:

$$y = a+b_1x_1+b_2x_2+b_3x_3\ldots+\Sigma$$

where

y = predicted group membership

a = constant

b = beta weight or coefficient

x = variable

Σ = unexplanable variance

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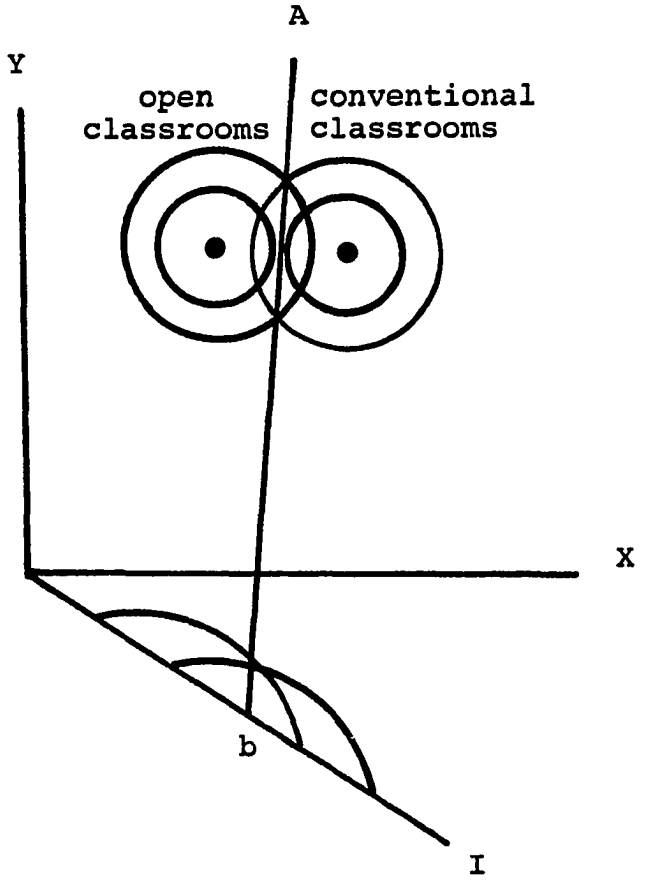
[1]William W. Cooley and Paul R. Lohnes, Multivariate Data Analysis, (New York: John Wiley and Sons, Inc., 1971), p. 245.

Figure 2 -- Geometric Interpretation of Group Means and the Grand Mean[1]



[1]William W. Cooley and Paul R. Lohnes, Multivariate Data Analysis, (New York: John Wiley and Sons, Inc., 1971), p. 245.

The open and conventional groups are represented by the two ellipses. Group centroids represent the estimated group mean and is expressed thusly:

$$\hat{Y} = a+b_1x_1+bx_2+b_3x_3\ldots+\Sigma$$

The mean to which an individual is closest determines group membership. The overlap of the upper and lower portions of the ellipses, through which a vector is drawn, represent the mean of the two groups. As was discussed elsewhere in this chapter, misclassification of students results from the overlap of the ellipses.

Additional data treatment involved a canonical analysis. The canonical correlation enabled the investigator to analyze the relationships between the environmental and cognitive variables. Analysis of the variable loadings revealed the contribution that each variable made to the correlation.

Summary

In this chapter the design of the study was discussed. The procedure for selecting the sample was described. Variables of the study were identified, in addition to the instruments used for the collection of data. Information regarding the development of the instruments, the validation process, and reliability were discussed. The chapter concludes with a description of the procedure used for collecting data, and the treatment of data.

CHAPTER IV

FINDINGS OF THE STUDY

The purpose of this study was to analyze differences between "derived" open and conventional classrooms in terms of the students' perceptions of the learning environment and reading and mathematics scores.

Included in this study were twenty-nine randomly selected teachers and their students from twenty-four open space and conventionally designed schools of the Oklahoma City School District. Data for five hundred-seventy students were gathered via the use of the My Class Inventory (MCI) and the Metropolitan Achievement Test.

This research was directed toward answering four questions. First, will "derived" teacher membership, based on Open Education Teacher Questionnaire scores, differ from "nominal" teacher membership, based on building design? The second question was concerned with whether there was a positive relationship between certain perceptions of the learning environment and classroom openness. The third question concerned the relationship between reading achievement and classroom openness. The fourth question was concerned with whether there was a relationship between mathematics achievement and classroom openness. Stated in null

form, the hypotheses were directed toward the degree of correct classification of students based on each dependent variable and/or the most parsimonious composite of variables. While the Discriminant Function Analysis is the primary thrust of this chapter, reliability estimates of the independent measure (OETQ), and a canonical analysis of the dependent measures (MCI and MAT) are presented.

Analysis of the Teacher Data

Table IV presents distributions of "nominal" teacher membership and "derived" teacher membership. Four of the thirteen nominal open classroom teachers were found to be operating in derived conventional classrooms. Six nominal conventional classroom teachers out of sixteen were shown to be operating in derived open classrooms. On the basis of OETQ criteria, nineteen classrooms were found to be correctly classified in terms of the school district's designation (nominal) of open and conventional classrooms. Based on OETQ scores, the percentage of correctly classified teachers was 65.

Table V displays the means, standard deviation, and alpha coefficients for each OETQ scale. The distribution of teachers' responses to individual items appears in Appendix D. Scale one, which represents one half of the test items, shows reliability at the .66 level. By deleting six items from the scale, reliability was raised to .78 (see Table VI). While the overall test reliability was .74, scales two, three,

TABLE IV

DISTRIBUTION OF TEACHERS BY NOMINAL AND DERIVED CLASSROOM MEMBERSHIP (N=29)

Teacher No.		Nominal Membership	Derived Membership
1	*	Conventional	Conventional
2	*	Conventional	Conventional
3	*	Conventional	Conventional
4	*	Conventional	Conventional
5	*	Conventional	Conventional
6	*	Conventional	Conventional
7		Open	Conventional
8	*	Conventional	Conventional
9	*	Conventional	Conventional
10	*	Conventional	Conventional
11	*	Conventional	Conventional
12		Open	Conventional
13		Open	Conventional
14		Open	Conventional
15	*	Open	Open
16		Conventional	Open
17		Conventional	Open
18	*	Open	Open
19		Conventional	Open
20	*	Open	Open
21		Conventional	Open
22	*	Open	Open
23		Conventional	Open
24	*	Open	Open
25	*	Open	Open
26		Conventional	Open
27	*	Open	Open
28	*	Open	Open
29	*	Open	Open

* Correctly classified (65% correct classification)

and six evidenced low reliability estimates. Scales four, five and seven show reliabilities of .58, .41 and .40, respectively. Scale five emerged from the collapsing of Seeking, which had two items, and Self-Perception's one item. It may be of interest to note that by deleting six items in scale one (Provisioning) the overall test reliability was improved from .74 to .78 (See Tables V and VI). Appendixes B and C display an item analysis of the OETQ.

Analysis of Student Data: Discriminant Function

Two summary tables are presented for each set of student data. One table displays data for the total student sample (N=570), and another table displays data for the upper and lower twenty-five percent of students as determined by OETQ scores (N=284). Tables VII and VIII present the size of the sample, mean, standard deviation, and grand mean for each of the dependent variables: satisfaction, friction, competitiveness, cohesiveness, difficulty, reading and mathematics scores.

The first step for the program was to consider each of the variables as a linear function to determine how effectively each one discriminated between the "derived" open and conventional groups. Based upon each variable as a predictor, F-values and the probability of individuals being classified as members of one of the two groups were generated.

Tables IX and X present the F-value and the correct

TABLE V

MEANS, STANDARD DEVIATIONS AND ALPHAS OF THE (OETQ) SCALES*

	Scales	No. Items	Means	S. D.	Alphas
1.	Provisioning	25	70.96	5.70	.66
2.	Instruction	5	13.72	1.57	- .22
3.	Diagnosis	4	11.69	1.62	.00
4.	Evaluation	5	14.72	2.51	.58
5.	Seeking/ Self-Perception	3	8.93	1.31	.41
6.	Humaneness	4	10.72	1.17	- .28
7.	Assumptions	4	11.93	1.53	.40
	Total	50	142.69	9.73	.74

* Based on 50 items

TABLE VI

MEANS, STANDARD DEVIATIONS AND ALPHAS OF THE (OETQ) SCALES*

	Scales	No. Items	Means	S. D.	Alphas
1.	Provisioning	19	53.10	5.84	.78
2.	Instruction	5	12.72	1.70	- .01
3.	Diagnosis	4	11.69	1.62	.00
4.	Evaluation	5	14.72	2.52	.58
5.	Seeking/ Self-Perception	3	8.93	1.31	.41
6.	Humaneness	4	11.93	1.26	- .07
7.	Assumptions	4	11.93	1.53	.40
	Total	44	125.03	9.74	.78

* Based on 44 items

TABLE VII

MEAN, STANDARD DEVIATION, AND GRAND MEANS OF ALL THE OPEN AND CONVENTIONAL CLASSROOMS FOR THE DEPENDENT VARIABLES

	Open (N=280)		Conventional (N=290)		
Variable	$\bar{X}$	S. D.	$\bar{X}$	S. D.	$\bar{\bar{X}}$
1. Satisfaction	5.36	2.26	5.88	2.20	5.62
2. Friction	5.94	2.13	5.23	2.23	5.58
3. Competiveness	6.20	1.66	5.97	1.84	6.08
4. Cohesiveness	6.26	1.94	6.19	2.18	6.23
5. Difficulty	3.82	1.91	4.16	2.13	3.99
6. Reading	55.95	19.50	54.85	20.27	55.39
7. Mathematics	63.79	21.71	62.61	19.96	63.19

TABLE VIII

MEAN, STANDARD DEVIATION, AND GRAND MEANS OF THE UPPER AND LOWER QUARTILES FOR THE DEPENDENT VARIABLES

	Open (N=133)		Conventional (N=151)		
Variable	$\bar{X}$	S. D.	$\bar{X}$	S. D.	$\bar{\bar{X}}$
1. Satisfaction	5.29	2.47	5.54	2.28	5.42
2. Friction	6.04	2.21	5.52	2.18	5.77
3. Competiveness	6.21	1.64	6.19	1.79	6.20
4. Cohesiveness	6.39	1.84	5.95	2.24	6.16
5. Difficulty	3.41	1.77	4.17	2.26	3.82
6. Reading	52.93	18.11	54.69	20.63	53.86
7. Mathematics	61.24	20.31	62.50	21.99	61.91

classification percentage for each variable and the most parsimonious composite. Statistical significance is shown at the .01 level for variables one, two and the most parsimonious composite. Variable five is significant at the .05 level. The second analysis, which analyzed the upper and lower 25%, yielded significance at the .01 level for variable five and the most parsimonious composite (see Table X). Variable two is shown to be significant at the .05 level. The F-value for variable three was insufficient for computation.

Tables XI and XII present the number of subjects classified into each of the two groups. To arrive at the classification percentages in the last column for Tables XI and XII, the following steps were computed: (1) divide the number of subjects in the open group by the total sample, (2) repeat step 1 for the conventional group, (3) divide the number of correctly classified for the open group by the number of subjects in the group, (4) repeat step 3 for the conventional group. After multiplying the results of step 1 by the results of step 3, and step 2 by step 4 the final procedure was to add the products of the two operations. As was pointed out in the presentation of data for Table X, the F-value for variable three (competitiveness) was insufficient for computation.

Tables XIII, XIV, XV and XVI display the coefficients and constants for the assignment of subjects into groups.

TABLE IX

F-VALUES AND CLASSIFICATION POWER OF
SINGLE VARIABLES AND MOST PARSIMONIOUS COMPOSITE (N=570)

Variable	F-Value	df	Correct % Classification
1. Satisfaction	7.97**	1/568	.55
2. Friction	14.90**	1/568	.55
3. Competitiveness	2.38	1/568	.51
4. Cohesiveness	.16	1/568	.48
5. Difficulty	3.92*	1/568	.52
6. Reading	.43	1/568	.51
7. Mathematics	.45	1/568	.50
Most Parsimonious Composite	10.25***	2/567	.57

*p < .05 (F=3.84, 1/568)
**p < .01 (F=6.63, 1/568)
***p < .01 (F=4.61, 2/567)

TABLE X

F-VALUE AND CLASSIFICATION POWER OF
SINGLE VARIABLE AND MOST PARSIMONIOUS COMPOSITE (N=284)

Variable	F-Value	df	Correct % Classification
1. Satisfaction	0.78	1/282	.54
2. Friction	3.89*	1/282	.51
3. Competitiveness	0.00	1/282	-
4. Cohesiveness	3.28	1/282	.51
5. Difficulty	9.87**	1/282	.56
6. Reading	0.58	1/282	.53
7. Mathematics	0.25	1/282	.51
Most Parsimonious Composite	7.31***	2/281	.59

*p < .05 (F=3.84, 1/282)
**p < .01 (F=6.63, 1/282)
***p < .01 (F=4.61, 2/281)

TABLE XI

CLASSIFICATION MATRIX FOR EACH VARIABLE AND MOST PARSIMONIOUS COMPOSITE FOR OPEN CLASSROOM STUDENTS (GROUP 1, N=280) AND CONVENTIONAL CLASSROOM STUDENTS (GROUP II, N=290)

	Satisfaction		Friction	
	Group I	Group II	Group I	Group II
Group I	119	161	174	106
Group II	90	200	142	148

	Competiveness		Cohesiveness	
	Group I	Group II	Group I	Group II
Group I	139	141	131	149
Group II	135	155	145	145

	Difficulty		Reading	
	Group I	Group II	Group I	Group II
Group I	126	154	150	130
Group II	117	173	153	137

	Mathematics		Most Parsimonious Composite	
	Group I	Group II	Group I	Group II
Group I	147	133	166	114
Group II	154	136	132	158

TABLE XII

CLASSIFICATION MATRIX FOR EACH VARIABLE AND MOST PARSIMONIOUS COMPOSITE FOR OPEN CLASSROOM STUDENTS (GROUP I, N=133) AND CONVENTIONAL CLASSROOM STUDENTS (GROUP II, N=151)

	Satisfaction		Friction	
	Group I	Group II	Group I	Group II
Group I	58	75	82	51
Group II	55	96	84	67

	Competiveness*		Cohesiveness	
	Group I	Group II	Group I	Group II
Group I			63	70
Group II			68	83

*F-Value insufficient for computation

	Difficulty		Reading	
	Group I	Group II	Group I	Group II
Group I	72	61	67	66
Group II	65	86	68	83

	Mathematics		Most Parsimonious Cmmposite	
	Group I	Group II	Group I	Group II
Group I	59	74	81	52
Group II	66	85	66	85

TABLE XIII

COEFFICIENTS AND CONSTANTS BY VARIABLE (N=570)

Variable	Open Coefficient	Constant	Conventional Coefficient	Constant
1. Satisfaction	1.07	-3.56	1.17	-4.16
2. Friction	1.23	-4.37	1.09	-3.55
3. Competiveness	1.99	-6.89	1.92	-6.44
4. Cohesiveness	1.45	-5.26	1.44	-5.16
5. Difficulty	0.92	-2.46	1.01	-2.79
6. Reading	0.14	-4.64	0.13	-4.49
7. Mathematics	0.14	-5.37	0.14	-5.20

TABLE XIV

COEFFICIENTS AND CONSTANTS FOR
MOST PARSIMONIOUS COMPOSITE

Variable	Open Coefficient	Constant	Conventional Coefficient	Constant
2. Friction	1.16	-5.69	1.00	-5.21
5. Difficulty	0.80	-5.69	0.90	-5.21

The coefficients or the numerical estimate of the contributions of each variable, provides the equation for classifying the subjects into groups. The equation is a constant plus a coefficient times the variable plus the error ($y = a+b_1x_1...+\varepsilon$). Results of this equation predicted the group to which the subject was a member. In both analyses Friction and Difficulty emerged as the variables which worked together to explain maximum variance between the two groups (see most parsimonious composite, Tables XIV and XVI).

Tables XVII and XVIII illustrate the multiple discriminant analysis yielded by the program in a stepwise manner, with one variable selected and entered into the set of discriminating variables at each step. The variables were selected on the basis of having the largest F-value or the highest multiple correlation. For example, Table XVII shows variable two as having the highest F-value, 14.90 (df = 1/568). The next entries, in order of F-value magnitudes were five, F = 10.25; four, F = 7.61; one, F = 6.66; seven, F = 5.32; and six, F = 4.43. The F-value for variable three was insufficient for computation of step seven.

Table XVIII (results of a second analysis) varies slightly from Table XVII in terms of variables entered. It will also be noted that variable three was computed in the second analysis, resulting in seven steps. Re-evaluation by the program at each step is illustrated by the differing contributions made first by the variable with the highest

TABLE XV

COEFFICIENT AND CONSTANT BY VARIABLE (N = 284)

Variable	Open Coefficient	Constant	Conventional Coefficient	Constant
1. Satisfaction	0.94	-3.18	0.98	-3.41
2. Friction	1.25	-4.48	1.15	-3.86
3. Competitiveness*				
4. Cohesiveness	1.50	-5.49	1.38	-4.84
5. Difficulty	0.81	-2.08	0.99	-2.76
6. Reading	0.14	-4.38	0.14	-4.63
7. Mathematics	0.14	-4.85	0.14	-5.03

*F-Value insufficient for computation

TABLE XVI

COEFFICIENT AND CONSTANT FOR
MOST PARSIMONIOUS COMPOSITE

Variable	Open Coefficient	Constant	Conventional Coefficient	Constant
2. Friction	1.20	-5.58	1.08	-5.61
5. Difficulty	0.72	-5.58	0.91	-5.61

TABLE XVII

F-VALUES FOR VARIABLES ENTERED (N=570)

Step Number	Variable Entered	F-Value To Enter	Table Value	Number of Variables Included	df
1	2	14.90*	6.63	1	1/568
2	5	10.25*	4.61	2	2/567
3	4	7.61*	3.78	3	3/566
4	1	6.66*	3.32	4	4/565
5	7	5.32*	3.02	5	5/564
6	6	4.43*	2.80	6	6/563

*$p < .01$
F-Value for variable was insufficient for computation of Step 7.

TABLE XVIII

F-VALUES FOR VARIABLES ENTERED (N=284)

Step Number	Variable Entered	F-Value To Enter	Table Value	Number of Variables Included	df
1	5	9.88*	6.63	1	1/281
2	2	7.32*	4.61	2	2/281
3	4	6.09*	3.78	3	3/281
4	6	5.13*	3.32	4	4/279
5	3	4.21*	3.02	5	5/278
6	1	3.56*	2.80	6	6/277
7	7	3.09*	2.64	7	7/276

*$p < .01$

F-value, then as a member of the composite competing for entry (see Tables XVII and XVIII). In the stepwise analysis variable two was entered, as shown in Table XVII (variable five in Table XVIII), thus the correlation between the entering variable and the first entered variable was removed, and the contribution of each remaining variable was calculated. Variable two in Table XVII (variable five in Table XVIII) emerged as the most significant in accounting for variance between the two groups.

Analysis of Student Data: Canonical Correlation

Table XIX displays the means and standard deviations for the five environmental variables and the two cognitive variables. Cohesiveness and Satisfaction, both of which are thought to relate positively to classroom practices, yielded mean scores of 6.23 and 5.62, respectively. Difficulty yielded the lowest mean score for the five environmental variables (see Table XIX).

Table XX presents correlations of the environmental variables and the cognitive variables. Examination of Table XX suggests a relatively high degree of independence of the environmental scales from the MCI. For example, Friction is shown to have a moderately inverse relationship with Satisfaction. Cohesiveness reflects a moderately positive relationship with Satisfaction. Competitiveness and Difficulty are shown to be unrelated to Satisfaction. Reading and

TABLE XIX

MEANS ($\bar{X}$) AND STANDARD DEVIATIONS (S. D.) FOR THE ENVIRONMENTAL AND COGNITIVE VARIABLES

	$\bar{X}$	S. D.
1. Satisfaction	5.62	2.24
2. Friction	5.58	2.21
3. Competitiveness	6.08	1.76
4. Cohesiveness	6.23	2.07
5. Difficulty	3.99	2.03
6. Reading	55.40	19.87
7. Mathematics	63.19	20.81

TABLE XX

CORRELATION MATRIX OF THE ENVIRONMENTAL VARIABLES AND THE COGNITIVE VARIABLES

	Satis-faction	Fric-tion	Competitive-ness	Cohesive-ness	Diffi-culty
1. Satisfaction	1.00	-0.38*	-0.12*	0.40*	0.03
2. Friction		1.00	0.35*	-0.30*	0.08
3. Competitiveness			1.00	0.02	0.09
4. Cohesiveness				1.00	-0.09
5. Difficulty					1.00

	Reading	Mathematics
1. Reading	1.00**	0.76
2. Mathematics	0.76	1.00

*$p < .01$
**$p < .001$

mathematics are shown to have a high degree of relationship (see Table XX).

Table XXI presents a Pearson Product analysis of the relationship between the environmental and cognitive variables. The relationship between Difficulty and the cognitive variables was significant at the $p < .01$ level. Satisfaction was significantly related to reading at the $p < .05$ level. Hays' assertion may be applicable to the findings in this table. He contends that any study can be made to show significant results if enough subjects are used. Hays goes on to say that, "In most experimental problems we want to find and refine relationships that 'pay off,' that actually increase our ability to predict behavior."[1]

TABLE XXI

PEARSON PRODUCT MOMENT CORRELATION OF ENVIRONMENTAL AND COGNITIVE VARIABLES

		Reading	Mathematics
1.	Satisfaction	-0.11*	-0.06
2.	Friction	0.05	0.04
3.	Competitiveness	-0.03	-0.01
4.	Cohesiveness	-0.08	-0.05
5.	Difficulty	-0.22**	-0.19**

*$p < .05$
**$p < .01$

[1]Hays, W. L. Statistics for Psychologists, New York: Holt, Rinehart, and Winston, 1963, p. 326-28.

Walberg suggests that when the overall association between two sets of variables is sought, a multivariate canonical correlation is the most useful statistical technique.[1] Table XXII summarizes the results of a canonical analysis in which the relationship between the first of two roots and each variable was significant at the $p < .0001$ level. The second root was not significant, $p < .86$. The loadings reveal that Difficulty, reading and mathematics are the primary variables involved in the significant root.

The high negative value of Difficulty indicates an inverse relationship with reading and mathematics. Satisfaction is shown to have a moderately inverse relationship with the cognitive variables, while Friction and Competitiveness seem to be unrelated. The large positive scores for reading and mathematics suggest that they are strongly related to each other and are inversely related to Difficulty (see Table XXII).

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[1] Walberg, Herbert J. "Generalized Regression Models in Educational Research, "American Educational Research Journal, Vol. VII, 1971, p. 78.

TABLE XXII

CANONICAL CORRELATION OF FIVE ENVIRONMENTAL VARIABLES AND TWO COGNITIVE VARIABLES (MULTIVARIATE ANALYSIS)

Variables	Canonical Root***
1. Satisfaction	-0.42*
2. Friction	0.20*
3. Competitiveness	-0.12
4. Cohesiveness	-0.31*
5. Difficulty	-0.86**
6. Reading	0.99****
7. Mathematics	0.78**

*p< .01
**p< .001
***p< .0001
****p< .000001

Summary

Data displayed in this chapter were presented in three stages. First, data analysis for the OETQ included a distribution of "nominal" and "derived" open and conventional classrooms, an item analysis, reliability estimates, and a distribution of teachers' responses.

The second stage presented data which were analyzed through a discriminant function program. This phase of the analysis was addressed to the hypotheses of the study. The findings indicated that while several variables and the most parsimonious composite of variables were statistically significant, so many subjects were misclassified the variables

can be said to have no practical value as predictors of group membership.

The final stage of the analysis was concerned with correlation coefficients of the environmental and cognitive variables. Tables for this stage included correlations of the MCI scales, reading and mathematics; Pearson's Product Moment; and a multivariate canonical analysis.

CHAPTER V

CONCLUSIONS

This study was concerned with analyzing the learning environment from two perspectives. Another analysis was performed on scholastic achievement scores. First, teacher perception of the learning environment was measured by the OETQ. Results provided a criterion measure for the establishment of open and conventional groups. The second assessment of perception involved the teachers' students. Five environmental variables and two achievement variables were measured by the My Class Inventory (MCI) and the Metropolitan Achievement Test, respectively.

From use of Cronbach's coefficient alpha as an estimate of internal consistency, reliability estimates were calculated for the OETQ. Scales one, four, five and seven were found to be at levels of .66, .58, .41 and .40, respectively. With reliability estimates of -.22, .00, and .28 for scales two, three and six, the overall test reliability was .74. After the deletion of six items from scale one reliability for the scale was improved from .66 to .78. The deletion of items from scale one raised the overall test reliability from .74 to .78 (see Tables V and VI).

Further analysis of the OETQ involved a distribution

of teachers' responses to each item, and the relationship of the items to the scale and the test. Means and standard deviations were calculated for the seven scales and the test (see Appendixes B through D).

Dependent variables were analyzed through the use of a discriminant function analysis and two correlation techniques. Based on each variable as a predictor, the program provided an F-value, and a probability statement regarding each individual's likelihood of being classified into one of the two groups. The multiple discriminant analysis of the composite set provided the order of entry, and the contribution of each variable. By entering variables with the highest F-value, the program provided the most parsimonious composite.

Hypotheses one, sub-one, and sub-two were rejected ($p < .01$). Hypothesis sub-five was rejected ($p < .05$). None of the environmental variables, nor the cognitive variables made enough of a distinction to be of any practical value in prediction. The dychotomous findings seem to support the power of the discriminant analysis statistic. Variables obtaining statistical significance, such as Satisfaction ($p < .01$), Friction ($p < .01$), and the most parsimonious composite ($p < .01$), could have led to premature conclusions. However, the classification scheme of the discriminant function analysis yielded percentages which were only slightly greater than the probably of happening by chance along (Satisfaction .55,

Friction .55, and the most parsimonious composite .57).

A high degree of satisfaction was obtained for the conventional group (see Tables VII and VIII). Satisfaction, according to Anderson, is influenced by students being satisfied with the work of the class.[1] He also contends that there is a positive relationship between satisfaction and individual productivity. The contention that children are more satisfied with diversified learning activities which evolve from their own interests and experiences was not supported. Findings are inconclusive with respect to Anderson's hypothesis that satisfaction relates to productivity. While there was no statistical significance between the two groups, the open group (which attained lower satisfaction) achieved higher means for both reading and mathematics (see Table VII). Paradoxically, by using a smaller N with the extremely open and conventional groups, satisfaction, reading and mathematics all favored the conventional groups (see Table VII).

Because cooperation is a major objective of open education, friction should relate negatively to openness. The elimination of norm referenced criteria and competition would appear to reduce friction (indicated by a lower score) in open classrooms. Data from this study reflect the opposite (see Tables VII and VIII). One possible explanation for the

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[1]Anderson, "Effects of Course Content and Teacher Sex on the Social Climate of Learning," p. 138.

higher level of friction experienced in many open classrooms may result from teachers' disorganization and lack of conceptionalization of the open process (leading to what is often referred to as chaos). A more positive explanation of the higher friction for open classrooms may result from children being encouraged to express differences openly.

No significant difference in cohesiveness was found between open and conventional classrooms. However, an examination of Tables VII and VIII show a slightly higher degree of cohesion for the open group.

Data displayed in this study may be encouraging to open education advocates for the same reasons advanced by Silberman and team teaching advocates. They argue that while novel organizational patterns (open classrooms and team teaching) are at least as good as traditional procedures,[1] they may well benefit their students in other ways.[2]

Other major analyses of student data involved a univariate analysis and a canonical analysis of the environmental and cognitive variables. The Pearson Product Moment correlation showed Difficulty relating to both reading and mathematics ($p < .01$). Satisfaction was shown to relate to reading ($p < .05$, see Table XXI). When intrepreting the results of Table XXI, one must be mindful of Hay's assertion

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[1]Ginther and Shrayer, "Team Teaching in English and History at the Eleventh Grade Level," p. 303-13.

[2]Silberman, Crisis in the Classroom, p. 66.

regarding the size of N and statistical significance.[1]

A canonical correlation was also applied to the student data. Two roots were extracted from the five environmental and two cognitive variables. Only the significant root was reported. This root was significant at the .0001 level. The maximum canonical correlation was .99 (reading). Correlation between mathematics and the root was .78. Difficulty, the other primary contributor, was -.86 (see Table XXII). The canonical relationship between reading and mathematics seems to support the relationship reported in Table XX. This correlation matrix (Table XX) shows a strong relationship (.76) between reading and mathematics. It may be inferred that the relationship which exists between reading and mathematics results from reading characteristics which are built into mathematics problems.

Difficulty was found to have a significant inverse relationship to the root. Since Difficulty, reading and mathematics were found to be the primary characteristics of the root, it can be said that difficulty is antithetical to these two cognitive functions. This runs counter to earlier contentions by Anderson.[2]

While results of this study must be interpreted with caution in generalizing to other classrooms, the findings may be of interest to those that believe open classrooms cause a decline in academic achievement. As was noted

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[1]Hays, Statistics for Psychologist, p. 326-28.

[2]Anderson, "Effects of Classroom Social Climate on Individual Learning," p. 149.

earlier in this chapter one analysis reflected a small advantage for the open group while another analysis showed a small advantage for the conventional group (see Tables VII and VIII). Neither was statistically significant. It should also be noted that the classification scheme for the environmental and achievement variables resulted in little better than a 50-50 probability that students were members of one group or the other.

Two conditions may account for the marginal (based on 50-50 criterion) classification of students into open and conventional groups. One condition relates to the perennial question of instrument reliability. Data displayed in Chapter IV reflect an over all OETQ reliability of .74. Three scales of the OETQ evidenced low reliability estimates (see Table V). Thus, maybe a more reliable criterion measure would have improved correctness of classification.

A second alternative explanation for the low classification results may relate to Featherstone's observation that in many open classrooms " . . . there is no basic change in method of teaching or classroom organization."[1] As was noted in Chapter III, a brief summary of each classroom's physical environment was recorded by the investigator. With the exception of open space, several teachers working in an area, and less drabness of the physical facility there

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[1]Featherstone, Schools Where Children Learn, p. 38.

appeared to be no difference between nominal open classrooms and conventional classrooms. Provisions of all classrooms visited consisted of sets of textbooks, some commercial materials for manipulation and games, and very little natural environmental material. While 69% of the teachers indicated the use of the community as part of the instructional program (see item 15, Appendix D), there was no concrete evidence of this occurrence.

Recommendations for Further Research

1. Refinement of the (OETQ) - Cronbach's coefficient alpha for internal consistency shows scales two, three and six to have low reliability estimates. By deleting these scales (Instruction, Diagnosis, and Humaneness) and collapsing Seeking and Self-Perception, the overall test reliability would be improved. The test would be composed of thirty-seven items after the deletion of the three scales.

2. Replication of Study Involving Similar Teacher - Student Sample - The use of a discriminant function to analyze the perceptions of another sample of teachers and their students would allow for more confidence in the validity of the predictors used in the study. Another sample is the traditional approach in any correlational study intrepretation of the open and conventional teacher designation and its cogency as a predictor variable.

3. Canonical Correlation of the Independent and De-

pendent Measures - An analysis of the relationship between the dependent measures (MCI and MAT) and the independent measure (OETQ) would yield invaluable information to researchers contemplating the replication of this study, or the use of the above instruments in similar studies.

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APPENDIX A

OPEN EDUCATION

TEACHER QUESTIONNAIRE

ID_____
1._____
2._____
3._____
_____

School_____
Classroom_____
Teacher_____

QUESTIONNAIRE

Instruction: For each of the following statements, circle the number which most closely expresses your estimate of the extent to which the statement is true of your own classroom. If the statement is absolutely not the case, circle "1"; if it is very minimally true, choose "2"; if the statement generally describes your classroom, choose "3"; if it is absolutely true choose "4".

	strongly disagree	dis-agree	agree	strongly agree
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 my 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

	strongly disagree	dis-agree	agree	strongly agree
7. The day is divided into large blocks of time within which children, with my 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 books, 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 I have developed.	1	2	3	4
13. Common environmental materials are provided.	1	2	3	4
14. Children may voluntarily use other areas of the building and school yard as part of their school time.	1	2	3	4
15. Our 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. I prefer 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

	strongly disagree	dis-agree	agree	strongly agree
19. The environment includes materials developed or supplied by the children.	1	2	3	4
20. I plan and schedule the children's activities, through the day.	1	2	3	4
21. I make sure children use materials only as instructed.	1	2	3	4
22. I group 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. I promote a purposeful atmosphere by expecting and enabling children to use time productively and to value their work and learning.	1	2	3	4
26. I use test results to group children in reading and/or math.	1	2	3	4
27. Children expect me to correct all their work.	1	2	3	4
28. I base my instruction on each individual child and his interaction with materials and equipment.	1	2	3	4
29. I give 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

	strongly disagree	dis-agree	agree	strongly agree
32. My lessons and assignments are given to the class as a whole.	1	2	3	4
33. To obtain diagnostic information, I observe the specific work or concern of a child closely and ask immediate, experience-based questions.	1	2	3	4
34. I base my instruction on curriculum guides or the textbooks for the grade level I teach.	1	2	3	4
35. I keep notes and write individual histories of each child's intellectual, emotional, and physical development.	1	2	3	4
36. I have children for just one year.	1	2	3	4
37. The class operates within clear guidelines, made explicit.	1	2	3	4
38. I take 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. I am in charge.	1	2	3	4
41. Before suggesting any extension or redirection of activity, I give 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

	strongly disagree	dis-agree	agree	strongly agree
43. I use tests to evaluate children and rate them in comparison to their peers.	1	2	3	4
44. I use the assistance of someone in a supportive advisory capacity.	1	2	3	4
45. I try to keep all children within my sight so that I can be sure they are doing what they are supposed to do.	1	2	3	4
46. I have helpful colleagues with whom I discuss teaching ideas.	1	2	3	4
47. I keep a collection of each child's work for use in evaluating his development.	1	2	3	4
48. Evaluation provides information to guide my instruction and provisioning for the classroom.	1	2	3	4
49. Academic achievement is my top priority for the children.	1	2	3	4
50. Children are deeply involved in what they are doing through the day.	1	2	3	4

Teacher's Name_____

School_____

Location_____

Present position: Permanent_____ Race:_____

Provisional_____ Sex: M F

Temporary_____

Age: 20-25_____ 41-50_____
26-30_____ 51-60_____
31-40_____ over 60_____

Education (check all applicable): Normal school degree_____
Bachelor's degree _____
Master's degree _____
Other (specify) _____

Address: in locality of school_____
elsewhere _____

Your classroom:

Grade level (check one)

2nd grade_____ Ungraded 2 _____ Ungraded 2-3_____
3rd grade_____ Ungraded 3 _____ Ungraded 3-4_____
4th grade_____ Ungraded 4 _____ Ungraded 2-4_____

Ability range: ability grouped _____
mixed ability grouping _____

Number of children _____

Racial composition: white _____
nonwhite_____

Years Teaching Experience _____

Approximate Income Range of Students' Parents _____

a). 4,000 - 6,000
b). 7,000 - 10,000
c). 11,000 - 15,000
d). 16,000 - over

APPENDIX B

CORRELATION OF ITEMS WITH SCALE AND TEST

(50 Items)

CORRELATION OF ITEMS WITH SCALE AND TEST

ITEM	SCALE	MEAN	SIGMA	R(TOTAL)	R(SCALE)
1	1	1.66	0.755	0.5483	0.6289
2	1	3.55	0.497	0.3347	0.1160
3	1	2.62	0.806	0.2313	0.3795
4	1	3.38	0.552	0.4009	0.3107
5	1	2.79	0.760	0.3549	0.4592
6	1	2.79	0.405	0.2724	0.2504
7	1	2.59	0.617	0.2773	0.3583
8	1	3.55	0.497	0.3988	0.4076
9	1	3.38	0.611	0.3504	0.3498
10	1	3.41	0.852	0.3733	0.1874
11	1	2.00	0.983	0.2056	0.3566
12	1	3.24	0.502	0.4459	0.5804
13	1	3.10	0.547	0.3167	0.0784
14	1	2.55	0.932	0.4373	0.7103
15	1	2.69	0.792	0.2559	0.5008
16	1	2.24	0.816	0.4089	0.6310
17	1	2.55	1.003	-0.4700	-0.3460
18	1	2.66	0.603	0.3989	0.4172
19	6	2.79	0.713	0.5719	0.6332
20	1	1.97	0.490	0.1279	0.3077
21	1	2.76	0.816	0.2251	0.5460
22	1	3.55	0.497	0.1637	0.0432
23	1	3.24	0.567	0.2763	0.3970
24	1	3.48	0.565	0.3663	0.3369
25	1	3.52	0.500	0.4656	0.2480
26	1	1.69	0.748	0.1195	0.1753
27	3	2.48	0.969	0.0195	0.2929
28	2	3.31	0.593	0.3392	0.5720
29	3	3.03	0.765	0.3628	0.5927
30	7	3.28	0.518	0.3314	0.5023
31	2	3.00	0.695	-0.1632	0.3470
32	2	1.93	0.944	-0.2200	0.4746
33	3	3.21	0.609	0.5577	0.6937
34	2	2.21	0.996	0.5795	0.3445
35	4	2.66	0.800	0.4116	0.5350
36	4	2.31	1.117	0.6717	0.7169
37	7	2.97	0.490	0.0484	0.5028
38	6	1.90	0.607	0.1113	0.4447
39	6	3.21	0.550	0.3924	0.3029
40	6	2.83	0.698	-0.2515	0.4056
41	2	3.28	0.447	-0.0358	0.4514
42	3	2.97	0.850	0.2863	0.5426
43	4	3.00	0.871	0.4597	0.5976
44	5	3.07	0.583	0.4231	0.6376
45	5	2.41	0.670	0.5905	0.6993
46	5	3.45	0.674	0.1474	0.6983
47	4	3.34	0.603	0.3648	0.6303
48	4	3.41	0.617	0.4637	0.6287
49	7	2.41	0.852	0.1320	0.6836
50	7	3.28	0.638	0.4139	0.6911

APPENDIX C

CORRELATION OF ITEMS WITH SCALE AND TEST

(44 Items)

CORRELATION OF ITEMS WITH SCALE AND TEST

ITEM	SCALE	MEAN	SIGMA	R(TOTAL)	R(SCALE)
1	1	1.66	0.755	0.5542	0.6569
2	1	2.62	0.806	0.3485	0.4921
3	1	3.38	0.552	0.4401	0.3304
4	1	2.79	0.760	0.4850	0.5642
5	1	2.79	0.405	0.2201	0.1986
6	1	2.59	0.617	0.2949	0.3757
7	1	3.55	0.497	0.3234	0.2891
8	1	3.38	0.611	0.2931	0.3080
9	1	2.00	0.983	0.2196	0.4207
10	1	3.24	0.502	0.4211	0.5443
11	1	2.55	0.932	0.4612	0.7058
12	1	2.69	0.792	0.2604	0.4691
13	1	2.24	0.816	0.4542	0.6606
14	1	2.66	0.603	0.4360	0.4311
15	6	2.79	0.713	0.5019	0.3300
16	1	1.97	0.490	0.2601	0.3748
17	1	2.76	0.816	0.3566	0.6421
18	1	3.24	0.567	0.2858	0.3990
19	1	3.48	0.565	0.3166	0.2150
20	1	3.52	0.500	0.4707	0.2417
21	3	2.48	0.969	0.0457	0.2929
22	2	3.31	0.593	0.2963	0.3926
23	3	3.03	0.765	0.3468	0.5927
24	7	3.28	0.518	0.2916	0.5023
25	2	2.00	0.695	0.3361	0.4963
26	2	1.93	0.944	-0.2170	0.3963
27	3	3.21	0.609	0.5100	0.6937
28	2	2.21	0.996	0.5748	0.5634
29	4	2.66	0.800	0.3156	0.5350
30	4	2.31	1.117	0.7209	0.7169
31	7	2.97	0.490	0.0003	0.5028
32	6	3.10	0.607	-0.0530	0.5513
33	6	3.21	0.550	0.4107	0.5196
34	6	2.83	0.698	-0.3336	0.5755
35	2	3.28	0.447	-0.0971	0.4179
36	3	2.97	0.850	0.2789	0.5426
37	4	3.00	0.871	0.5037	0.5976
38	5	3.07	0.583	0.4364	0.6376
39	5	2.41	0.670	0.5941	0.6993
40	5	3.45	0.674	0.0922	0.6983
41	4	3.34	0.603	0.3616	0.6303
42	4	3.41	0.617	0.3819	0.6287
43	7	2.41	0.852	0.2185	0.6836
44	7	3.28	0.638	0.3480	0.6911

*Based on 44 items, Six items from scale one were deleted.

APPENDIX D

DISTRIBUTION OF TEACHER RESPONSES

TEACHERS' CHOICE DISTRIBUTIONS (PERCENTAGES)

ITEM	REV	1	2	3	4
1	1	3	7	41	48
2	0	0	0	45	55
3	1	10	52	28	10
4	0	0	3	55	41
5	1	17	48	31	3
6	0	0	21	79	0
7	0	3	38	55	3
8	0	0	0	45	55
9	0	0	7	48	45
10	1	59	31	3	7
11	1	10	17	34	38
12	0	0	3	69	28
13	0	0	10	69	21
14	0	17	24	45	14
15	0	10	21	59	10
16	0	21	38	38	3
17	0	17	31	31	21
18	0	0	41	52	7
19	0	3	28	55	14
20	1	0	10	76	14
21	1	17	48	28	7
22	0	0	0	45	55
23	0	0	7	62	31
24	0	0	3	45	52
25	0	0	0	48	52
26	1	0	17	34	48
27	1	14	41	24	21
28	0	0	7	55	38
29	1	3	17	52	28
30	0	0	3	66	31
31	1	0	24	52	24
32	1	41	31	21	7
33	0	0	10	59	31
34	1	17	10	48	24
35	0	10	24	55	10
36	1	21	21	28	31
37	0	0	14	76	10
38	1	0	14	62	24
39	0	0	7	66	28
40	0	3	24	59	14
41	0	0	0	72	28
42	0	3	28	38	31
43	1	34	34	28	3
44	0	0	14	66	21
45	1	0	52	38	10
46	0	3	0	45	52

Teachers' Choice Distributions (Percentages) continued

ITEM	REV	1	2	3	4
47	0	0	7	52	41
48	0	0	7	45	48
49	1	10	34	41	14
50	0	0	10	52	38

*The columns labeled 1 through 4 represent a 4-point format (strongly disagree, disagree, agree, strongly agree). Items that imply conventional characteristics were stated negatively and, hence, the reverse coding is represented by the symbol "1" (see column labeled Rev).

APPENDIX E

MY CLASS INVENTORY

D I R E C T I O N S

This is not a test. The questions inside are to find out what your class is like. Please answer all the questions.

Each sentence is meant to describe your class. If you agree with the sentence circle yes. If you don't agree with the sentence, circle no.

E X A M P L E

Circle Your Answer

1. Most children in the class are good friends. Yes No

If you think that most children in the class are good friends, circle the yes like this:

1. Most children in the class are good friends. (Yes) No

If you do not think that most children in the class are good friends, circle the no like this:

1. Most children in the class are good friends. Yes (No)

Now turn the page and answer all the questions about your class.

		Circle Your Answer	
1.	The pupils enjoy their school work in my class.	Yes	No
2.	Children are always fighting with each other.	Yes	No
3.	The same people always do the best work in our class.	Yes	No
4.	In our class the work is hard to do.	Yes	No
5.	My best friends are in my class.	Yes	No
6.	Some of the children in our class are mean.	Yes	No
7.	Most pupils are pleased with the class.	Yes	No
8.	Children often race to see who can finish first.	Yes	No
9.	Many children in the class play together after school.	Yes	No
10.	Most children can do their school work without help.	Yes	No
11.	Some pupils don't like the class.	Yes	No
12.	Most children want their work to be better than their friend's work.	Yes	No
13.	Many children in our class like to fight.	Yes	No
14.	Only the smart people can do the work in our class.	Yes	No
15.	In my class everybody is my friend.	Yes	No

		Circle Your Answer	
16.	Most of the children in my class enjoy school.	Yes	No
17.	Some pupils don't like other pupils.	Yes	No
18.	Some pupils feel bad when they do not do as well as the others.	Yes	No
19.	In my class I like to work with others.	Yes	No
20.	In our class all the pupils know how to do their school work.	Yes	No
21.	Most children say the class is fun.	Yes	No
22.	Some people in my class are not my friends.	Yes	No
23.	Children have secrets with other children in the class.	Yes	No
24.	Children often find their work hard.	Yes	No
25.	Most children don't care who finishes first.	Yes	No
26.	Some children don't like other children.	Yes	No
27.	Some pupils are not happy in class.	Yes	No
28.	All of the children know each other well.	Yes	No
29.	Only the smart pupils can do their work.	Yes	No
30.	Some pupils always try to do their work better than the others.	Yes	No

		Circle Your Answer	
31.	Children seem to like the class.	Yes	No
32.	Certain pupils always want to have their own way.	Yes	No
33.	All pupils in my class are close friends.	Yes	No
34.	Many pupils in our class say that school is easy.	Yes	No
35.	In our class some pupils always want to do best.	Yes	No
36.	Some of the pupils don't like the class.	Yes	No
37.	Children in our class fight a lot.	Yes	No
38.	All of the pupils in my class like one another.	Yes	No
39.	Some pupils always do better than the rest of the class.	Yes	No
40.	School work is hard to do.	Yes	No
41.	Certain pupils don't like what other pupils do.	Yes	No
42.	A few children in my class want to be first all of the time.	Yes	No
43.	The class is fun.	Yes	No
44.	Most of the pupils in my class know how to do their work.	Yes	No
45.	Children in our class like each other as friends.	Yes	No

This instrument was developed at Harvard University by Gary L. Anderson and Herbert J. Walberg, May 1968. Revised, January 1969, by G. J. Anderson and Ronald E. Cayne, Faculty of Education, McGill University.

APPENDIX F

APPLICATION TO CONDUCT STUDY

RESEARCH APPLICATION TO OKLAHOMA CITY PUBLIC SCHOOLS

Applicant's Name Lee A. Morris University of Oklahoma
Address 3400 E. Maxwell Drive Telephone Number 427-6367 Degree Program Ed.D.
Advisor's Signature Michael Langenbach Department Education

TITLE: Discriminate Analysis of the Learning Environment - Reading and Mathematics Achievement In Open And Conventional Classrooms

OBJECTIVES: To analyze the effect Open and Conventional classroom methods have on the learning environment, reading and methematics achievement.

PROCEDURE: (General Design, Population and Sample, Instrumentation, Analysis, Time Schedule, etc.; use back of sheet, if necessary)

The purpose of this study is to discriminate between open and conventional classrooms by analyzing these independent variables: (1) The learning evnironment, (2) reading achievement, and (3) mathematics. A discriminate function program will analyze student data and categorize or assign them to "actual" open and conventional classrooms. By using a multivariate analysis, several scores can be reduced to a single score which has maximum potential for distinguishing between members (students) of two groups (open and conventional).

For an analysis of dependent variables (open and conventional methods), classrooms will be the units of measure. Twenty open space and twenty conventional classrooms will be randomly drawn from the Oklahoma City School System. Second through fourth grade teachers and their classes, with one or more years experience within the school designs in question, will comprise the sample.

An open education teacher questionnaire will be administered to all teachers of the sample (open and self-contained). Actual teacher membership of the groups will be determined from the results.

The concept of "nominal" and "actual" teacher membership is used in this study to describe members of the groups prior to administration of the questionnaire (nominal), and following administration of the instrument (actual).

Instruments used in the study will be as follows: (1) Open Education Teacher Questionnaire (OETQ), and (2) My Class Inventory (MCI). Test scores from the 1973-74 standardized testing program will be used to measure students' achievement in reading and mathematics. (Cont'd on back)

INVOLVEMENT OF OKLAHOMA CITY SCHOOLS: (use back of sheet, if necessary)

The research department's help is requested in the random selection of classrooms from which the study will draw. In an effort to get the involved classrooms' full cooperation and committment, it is requested that the research department join the investigator in making the initial contact with teachers and principals. The investigator feels that the school district will benefit from the findings and the open education instrument.

Submit 4 copies to: Research Coordinator, Oklahoma City Public Schools, 900 N. Klein, Oklahoma City, Oklahoma 73106

All applications will be reviewed by a Research Committee. You will be notified by mail as to the decision of the committee, and this process will usually take about two weeks.

Prodedure: (cont'd)

Administration of the (OETQ) and (MCI) will be conducted during the month of April 1974.

APPENDIX G

CORRESPONDENCE

The University of Oklahoma

Teacher Corps
(405) 325-1751

October 31, 1973

Educational Testing Service
Princeton, New Jersey 08540

Dear Sir:

Please send the following document for research toward a doctoral dissertation that is currently underway:

Bussis, Anne M. and Chittenden, E.A., Analysis of an Approach to Open Education. Princeton, N.J.: Educational Testing Service, 1970.

The necessary cost and expenses will be paid upon receipt of the literature.

Sincerely,

Lee Morris

LM/jp

ATLANTIC INSTITUTE OF EDUCATION

5244 South Street, Halifax
Nova Scotia, Canada
Area Code 902/425-5430

Office of the Assistant Director

8 January 1974

Mr. Lee A. Morris
The University of Oklahoma
555 Constitution
Room 237
Norman, Oklahoma
73069

Dear Mr. Morris:

Further to your letter of January 3, enclosed please find the Learning Environment Inventory and the My Class Inventory as requested.

I would be pleased to receive your cheque in the amount of $5.00 to cover printing and mailing.

Yours sincerely

Gary J. Anderson

GJA/bo
Encls.

January 3, 1974

Dr. Gary J. Anderson
Atlantic Institute of Education
5244 South Street
Halifax, Nova Scotia, Canada

Dear Dr. Anderson:

In a conversation with Dr. Walberg of the University of Illinois, Campus Circle, he suggested that I write you requesting a Learning Environment Inventory (LEI) Manual. The manual and student instruments (if separate from manual) are needed for a doctorial study in which the learning environment is one diminsion of the investigation.

I am aware that there is a cost involved, although, the exact price of the material is not known. Please bill me or send the material C.O.D. I am prepared to defray all expense involved.

Your prompt attention to this matter is appreciated.

Sincerely,

Lee A. Morris

Lee A. Morris

LM/jp