AN INSTRUMENT FOR THE ANALYSIS OF INTERMEDIATE SCIENCE CURRICULUM STUDY TEACHER BEHAVIOR

by

JEANNETTE McCORKLE RICHMOND

B.S., Iowa State University 1963

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1973

Approved by:

Robert K. James

Major Professor

ACKNOWLEDGEMENTS

The author acknowledges her gratitude to Dr. Robert K. James, major professor, for his guidance throughout this project and to Dr. Michael C. Holen for his interpretations of factor analysis matrices.

A special acknowledgement to my husband, James, for his patience and support.

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

Instructional improvement with regard to teacher-pupil relationships and teacher behavior has received widespread attention in the last few decades. Correspondingly new curriculums and modified old curriculums have altered the planned-for teacher-pupil interactions and the desired teacher behavior. A more personal, one-to-one correspondence between the teacher and student was incorporated into the new curriculums. Changing roles required the teacher to behave as a resource person instead of a presenter of information. In the Intermediate Science Curriculum Study (ISCS) program the first level student was helped to develop the necessary skills and understandings before expanding into free inquiry. While this occured the teacher found himself part of the educational process, not its center. Each student decided his pace, depth, and level of instruction instead of the teacher doing this collectively for the class.

As the ISCS approach is quite different from previous science materials, the expected teacher behavior required an adjustment on the part of the experienced teacher. Many practical and intellectual problems arose for the ISCS teacher; therefore, it was of interest to check teacher behavior and the student perception of teacher behavior and classroom by means of a written instrument. The score of the instrument could signal a need for further adjustments and improvements needed in the classroom and the teacher behavior.

The Intermediate Science Curriculum Study Program was based on student investigations that used the structure and the processes of science co-ordinated together to give rise to science concepts. In the program the seventh grader is at first guided in the investigations and, as progress is shown, gradually allowed more independent inquiry. The eighth grader is allowed independent inquiry plus offered new concepts through sequential laboratory activities. The ninth grader is completely independent to study self-chosen topics. The ISCS teacher is expected to demonstrate an interest in science, an acceptance of new ideas and an ability to interact well with individual students and groups of students. The teachers also have to devise means of making equipment available to each student when necessary, incorporating rate of progress into grading, answering all the questions and co-ordinating the assistance of the students in solutions to practical problems.

The problem faced by the ISCS curriculum as it expanded throughout the country was the manner in which it was taught. It was to the teacher's and school's advantage for each ISCS teacher to attend a familiarization program. The changes from the center of the educational process to a part of the process was disquieting for many teachers; modification of many present attitudes and approaches toward teaching was a must. It was assumed that those teachers that had trained specifically for ISCS did maintain the modified behavior and would not feel threatened by the instrument or checklist used by their students.

Statement of the Problem

The objective of this study was to create an instrument that accurately relayed through student answers whether the teacher had genuinely adopted the ISCS desired teacher behavior for teaching science in the junior high school.

Chapter 2

A REVIEW OF LITERATURE

Initial studies of analysis of classroom behavior between teacher and student were conducted by H. H. Anderson (1939). Anderson's findings indicated teacher behavior to the more dominative than integrative. Reliable measures and records of teacher behavior were possible and children's behaviors were consistent with the kind of personality the teacher displayed in the classroom.

Anderson took as his subjects "fifty-five kindergarten children attending three groups. In general the children were superior in intelligence. In school X, an attempt has been made to enroll younger children in the morning group. The enrollment in school X was twenty-three in the morning group, twenty-one in the afternoon group and in school Y, eleven." (#3, p. 76)

Behavior of each of the teachers was observed for seventy-three five-minute periods and was recorded as dominative or integrative by two independent observers. From this data reliability coefficients for the observers were established. Dominative was that behavior characterized by rigidity of purpose, an unwillingness to admit individual differences'; it was antagonistic to a concept of growth. Integrative behavior was consistant with the concepts of growth and learning and allowed for individual differences.

Lewin, Lippitt and White (1939) found in their studies with "boys' clubs" that different types of leadership produced different group and

individual behaviors; the leaderships, a primary factor in producing changes, was categorized as authoritative, democratic or "laissez-faire" and exhibited via verbal behaviors and allowed freedom-of-movement in the meetings.

The study used four clubs of five boys each and four different adult leaders. Prior to organizing and equating the clubs, the entire schoolroom was studied. The interpersonal relationships between the boys were ascertained; social behavior ratings by teachers were gathered and direct observations were made. Then from the groups of volunteers four five-member clubs were selected to equate the same pattern of behavior and background for the club as a whole.

The clubs were observed in terms of authoritarian behavior and democratic behavior (each similar, respectfully to the dominative and integrative behaviors defined by Anderson) and "laissez-faire" behavior which involved a group leader that did not participate in groups or individual decisions and activities. Each leader was to play an autocrat and a democratic leader at least once to control the factor of a leader's personality.

The observations of the club consisted of recording each child's social approaches and responses to the leader, a group structure analysis, dynamic group changes, inter-club relationships and stenographic records of all conversations. When all were synchronized, it was found "the authoritarian club members developed a pattern of aggressive domination towards one another and their relation to the leader was one of submission or of persistent demands for attention. The interactions in the democratic club were more spontaneous, more fact-minded and friendly. Relations to the leader were free and on an 'equality basis'." (#11, p.277) It was

also found the authoritarian group was more aggressive by a ratio of forty to one.

John Withall (1949) was one of the first to observe a classroom interaction in terms of a categorized teacher behavior. He used a climate index of seven categories to interpret the "general emotional factor which appears to be present in interactions occuring between individuals in face-to-face groups" (#16, p.49), that is, interactions between teacher and student in a classroom situation. Withall used transcripts made from twenty-three seven-minute excerpts and five full class-session sound recordings of five regular classes held in a laboratory school. His findings indicated identification of different patterns of teacher verbal behavior can be made and a consistent day-to-day pattern of verbal behavior for a given teacher can be assessed.

External observers for categorizing teacher behavior were not used by Morris Cogan (1956). Instead he relied on student perceptions of their teachers. This method appears productive as consistent results and justifiable student observations were given.

A written instrument was given to nine hundred eighty-seven eighth graders in five public junior high schools with a total of thirty-three teachers. A scale, assessing students perceptions of the teacher, was developed to see if students recognize the teachers as someone who makes them central to classroom activities and decisions or makes them peripheral to the classroom management. Cogan analyzed his findings and found an individual student could make consistent differentiations between the behavior of different teachers. Also the group of students seemed to be in agreement on the behaviors of the same teacher; thus, the group scores differentiate between different teachers. Cogan found that students who

perceived their teacher's behavior as integrative completed more required and self-initiated work with the opposite true for dominative behavior.

The above discussed research does not mean there was a single pattern of behavior maintained by the teacher; rather, the teacher was flexible. The question Ned Flanders (1965) asked was when should a teacher use an integrative or dominative influence. Flanders qualified teacher influence (teacher talk) as direct or indirect. Direct influence is the minimization of a student's response freedom; indirect is the opposite - maximizing the student's response freedom. The two categories of verbal interaction by the teacher plus one category on student verbalization were then subdivided into a total of ten sub-categories - "accepts feelings, praises or encourages, accepts or uses ideas of student, asks questions, lecturing, giving directions, criticizing or justifying authority, student talk-response, student talk-initiation, and silence or confusion." (#6, p.20)

Every three seconds a trained observer recorded the number of the appropriate category and continued to do so for the total observation. The data were arranged in a matrix and analyzed by first computing the proportion of the total interaction in the observed classroom situation in each category and the percentage of total teacher talk in each category. The indirect/direct ratio is calculated and used in examining the type of motivation and control in a given classroom. The analysis then is used for research or as an in-service training device for teachers using either his own classroom behavior or that of another teacher.

Amidon and Hunter (1967) with a seventeen category verbal interaction category system and Hough (1967) with a sixteen category observational system of instruction analysis developed the two systems parallel

to the Flanders system and utilized the same observation techniques. The findings of both studies largely supported Flanders; the matrix analysis indicates the amount, the sequence and the pattern of verbal behavior in the classroom according to the categories of the two respective systems. All three investigations found classroom analysis useful in helping teachers examine their classroom behavior in an objective manner.

In a study to determine if there were verbal behavior patterns characteristic of superior or "master" teachers (so identified by their administrators and supervisors), Amidon and Giamatteo (1955) observed one hundred fifty-three elementary school teachers. Trained observers used the Flanders system of interaction analysis. The results of the study indicated that the verbal behavior patterns of the thirty-three superior teachers could be identified and that they significantly differed from those of the one hundred twenty randomly selected teachers. The same results were indicated in a study of physics teachers by Pankratz (1967). The relative use of any one category of verbal behavior showed a consistent pattern regardless of age level or academic course.

Improvement of teaching by in-service teachers was discussed and studied by Flanders (1963) and Storlie (1963). Both men agreed interaction analysis produced both the model of the kind of teaching behavior a teacher desired and the feedback of the teachers' progress toward the development of the desired teaching behavior. The teacher himself had to work to improve.

Flanders discussed a project involving fifty-one high school teachers that were training to observe classroom interaction. The purpose of the training was to increase the teacher influence flexibility and to increase the teacher behavior supportive of pupil participation. The

study showed that those teachers active in the training made changes in their classroom behavior consistent with the studies' objectives. Also those teachers whose classroom behavior is parallel to the methods used were influenced in their training.

Storlie used fifty-one secondary teachers - all volunteers - and randomly divided them into two groups. Direct in-service training was used on the Monday group and the Saturday group was exposed to indirect in-service training. Ratings by the teachers of demonstrations, panels and group discussions were higher for one group than the other - apparently dependent on the instructor's influence patterns. The teachers rated the direct in-service training significantly lower.

The objective of this author's study of ISCS teachers was to ascertain information about a teacher's behavior through the perceptions of the students taught by this teacher. Cogan (1956) discussed the problem of student reliability by citing other researchers' work and examining his own research. Cogan collected data from nine hundred eighty-seven eighth grade students, thirty-three teachers and the administrators of five public junior high schools offering departmentalized instruction. The analysis examined the average scores of the teachers to determine whether differences in teacher behavior could be detected. The conclusion Cogan reached was that children in the intermediate grades could give answers that were reliable and valid. The group of students were in agreement about the same teacher's behavior; simple variance analysis indicated the group scores discriminated among teachers. Their reliance on student's perceptions is adequate for data collection from a questionnaire.

Kockendorfer (1967) used the idea of student perceptions to evaluate classroom practices. He developed an instrument (Biology Classroom Activity

Checklist or BCAC) to analyze the relationship between actual classroom practices and the philosophy and rationale of the BSCS program (see Appendix, p. 32). After determining specific classroom activities (written as seen from a student's viewpoint) and organizing them into seven sections, two forms of the instrument were devised; form A used true or false as answers and form B used never, seldom, often or always as answers. Both forms were administered to a pilot group of biology students. Because form B took fifty percent more time to answer and there was only slight differences in scores between A and B, Kochendorfer used form A in subsequent studies. The final form was administered to sixty-four classrooms with one thousand two hundred sixty-one tenth-grade biology students; a reliability coefficient of 0.96 was reported along with a content validity coefficient of 0.84.

LaShier (1971) used Kochendorfer's idea at the ISCS Summer Institute held at the University of Kansas. He used the BCAC as a guide and devised a thirty-eight item instrument concerning the ISCS program. In a paper presented at the annual Association for the Education of Teachers of Science meeting, he discussed the institute and the evaluative instrument (Classroom Activity Checklist). Using this CAC as a pre- and post-test of the thirty-five institute participants, LaShier found that, in general, those particular ISCS teachers were modifying their classroom practices in a positive direction.

The ISCS program was conceived to stimulate abstract, inner-directed learning on the part of the student. The classroom interaction required an indirect teacher behavior and a supportive emotional climate. In order to satisfy the ISCS requirements, several questions concerning teacher behavior needed to be answered. Could effective teacher behaviors be identified? Could an experienced teacher who was motivated to improve classroom teaching

actually modify his teaching behavior? Could the students' perceptions of the teacher be considered reliable? As the research discussed showed, each consideration in the problem was answered in the affirmative. This would seem to indicate an instrument could be constructed to survey an ISCS teacher and his classroom behavior with students supplying the data.

Chapter 3

RESEARCH PROCEDURES

The study group was a group of four hundred seventh graders - fifty-four from Harper, Kansas (population 1667) and three hundred forty-eight from Liberal, Kansas (population 13,471). These two cities are located in the south central and southwestern area of the state, respectfully. The students were taught by five teachers with teacher A having fifty-four students, teacher B eighty-four students, teacher C twenty-nine students, teacher D fifty-nine students and teacher E one hundred seventy-six students. Teacher (s) B, C, D, and E are from Liberal, Kansas and teacher A is from Harper, Kansas. Each teacher, with the exception of teachers C and B, previously trained in an ISCS summer institute and was an experienced teacher with at least one year teaching experience.

The instrument used in the study (see Appendix, p. 24) was devised by using behavior categories defined by Ned Flanders (1965), ISCS (1969) desired characteristics of teacher behavior, a science oriented activity checklist and the instruments developed by Kochendorfer (1968) and LaShier (1971) respectfully. The Flanders categories used included acceptance, praise, student ideas, responses and talk and teacher questions, directions and criticism. Evaluation, organization of materials and equipment, resource person, teacher's science attitudes and teacher-student interaction were the ISCS teacher qualifications used. The science checklist, the Kochendorfer instrument and the LaShier instrument provided ideas for questions in all the above mentioned categories.

The questionnaire was checked for readability by an ninth grade junior high school science class at Manhattan Junior High School and by four master teachers - Ron Fisher of Maquoketa, Iowa, Beverly Phillips of Mt. Vernon, Iowa, Randall Zirkelbach of Maquoketa, Iowa, and Carroll Scott of Williamsburg, Iowa. Their criticisms were received and corrections were made where needed.

The questionnaire was constructed to give objective yes-no answers to questions examining behavior categories of science teachers. This closed response form enabled the responses to be easily counted quantitatively. The objective questioning attempted to avoid leading questions; the non-use of an IBM answer sheet attempted to avoid any threat or confusion a student might feel. Both negative and positive inquiries regarding each category were randomly ordered throughout the instrument in an effort to eliminate biasing the response of each question; there were to be no right or wrong answers as far as the subjects were concerned.

The use of seventh grade science students was apt as they are in the first year of a sequential curriculum and their evaluations of the teacher could be used to improve and/or change in the following two years. The problem of obtaining replies was minimal as the questionnaire was administered during class time. The teachers themselves administered the questionnaire by reading the page of instructions; they were asked to tell the students not to discuss questions, to relax as it was not graded nor read by the teacher and to answer to the best of their knowledge. The teachers did not monitor their own classrooms, but used the honor system and the students collected the answer sheets.

The experimental design for this study utilized "action research" which emphasized the involvement of the teachers in problems important in

their own classrooms. The objective to be met was the detection of differences in teaching by ISCS teachers as some were trained in equivalent summer institutes and expected to employ the teacher behaviors desirable in ISCS teachers. The teachers were not to feel threatened by these student questionnaires but were to use the responses in conjunction with their own self-evaluation to improve and/or modify their behavior.

Chapter 4

FINDINGS

The instrument used in this study was to be designed to differentiate between teacher classroom behaviors. Students supplied the data through their perceptions of the teacher. Factor analysis was originally instituted "for the study of the basic or underlying variables needed to account for individual differences in measurements of abilities or aptitudes in terms of test scores." (#7, p. vii) In this study factor analysis was utilized to determine whether the factors used in classifying the questions could be adequately accounted for by a smaller number of categories than originally used. Could the classroom differences be explained by a smaller number of reference variables.

Upon return of all the questionnaires, they were alphabetized and the answers recorded by student number on data processing cards for use in a factor analysis. (Appendix, p. 30) The program used was Factor Analysis, BMDX72, Biomedical Computer Programs, University of California Publications. The output from the program included the means and standard deviations, the correlation matrix, the eigenvalues and cumulative proportion of the total variance, the communalities, the factor loadings matrix before rotation, the rotated factor loading matrix, the correlation matrix of the rotated factors and the factor scores. The input, derived from the questionnaires, for the program was raw data. The raw data was the scoring of each variable.

Factor analysis makes a basic assumption that "a battery of inter-correlated variables has common factors running through it and that the socres of an individual can be represented more economically in terms of these reference factors." (#7, p.44) In order to determine the common factors the rotated factor loadings, arranged in a matrix, must be known. Factor loadings are the square roots of the common variances and represent the amount of correlation of each variable with the factor.

When this project was initiated ten separate categories were considered and questions were composed for each of these categories. The ten categories with their questions were then put together to create the sixty-eight item questionnaire. The questions were randomly arranged rather than asked by category. The interpretation of the rotated factor matrix revealed that instead of ten separate categories there were only two categories of twenty-five items each.

The rotated factor matrix was interpreteted to determine the reduced number of factors and those variables to be of little or no value to the instrument. (Table I, p.16) With eighteen items eliminated, the remaining fifty items loaded onto two factors. The first thirteen items listed for factor one fit together best while the first eight items listed for factor two fit together best.

After establishing the reduced number of items and the reduced number of factors, four reliability tests were run using the odd-even method. The corrected odd-even reliability score for the fifty items was 0.7957; for factor one the score was 0.6448 and for factor two the socre was 0.6261. The reliability score for the sixty-eight items was 0.7866.

THIS BOOK
CONTAINS
NUMEROUS PAGES
WITH THE ORIGINAL
PRINTING BEING
SKEWED
DIFFERENTLY FROM
THE TOP OF THE
PAGE TO THE
BOTTOM.

THIS IS AS RECEIVED
FROM THE
CUSTOMER.

Table I. Findings After Evaluation of the Rotated Factor Matrix

Factor One	Factor Two	Items Eliminated
1	2	7
4	19	9
6	20	10
16	28	17
23	31	18
30	53	21
34	58	22
35	68	25
37	3	26
40	5	32
44	11	36
51	14	41
52	15	43
8	27	45
12	42	49
13	46	56
24	47	61
29	54	67
33	55	
38	57	
39	59	
48	60	
50	62	
63	64	
66	65	

Chapter 5

SUMMARY AND CONCLUSIONS

The objective of this study was to create an instrument that accurately relayed through student answers whether the teacher has adopted the ISCS desired teacher behavior for teaching science in the junior high school. Four hundred seventh graders answered a sixty-eight item questionnaire which was scored and examined by the factor analysis computer program, BMDX72.

The interpretation of the rotated factor matrix revealed there were two factors instead of the originally designed ten factors. The low values of the factor loadings in the matrix seemed to indicate these two factors overlapped slightly; this could be explained as the factors were dealing with a teacher's classroom behavior. Factor one appeared to contain items on a teacher's personal rapport with students as a teacher and friend. It seemed to examine the indirect/direct behavior of a teacher. Factor two dealt with the classroom management, that is, location of the materials, examinations, treatment of students' experimental work and the teacher's achievement expectations of the students collectively and individually.

The reliability score for the fifty-item exam indicated it is of practical use such as pre and post studies for self-evaluation, institute evaluations, etc. as it is written. The reliability scores for each of the factors, however, is not sufficiently high enough to recommend they be used separately. The instruments strength lies in all fifty items being used together as one unit questionnaire.

REFERENCES CITED

1. Amidon, E. J. and M. Giamatteo
   1965 "The Verbal Behavior of Superior Elementary Teachers". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J.B. 186-188.

2. Amidon, E. J. and E. Hunter
   1967 "Verbal Interaction in the Classroom: The Verbal Interaction Category System". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J.B. 141-149.

3. Anderson, H. H.
   1939 "The Measurement of Domination and of Socially Integrative Behavior in the Teacher's Contacts With Children". Child Development, 10:73-89.

4. Cogan, M.
   1956 "Theory and Design of a Study of Teacher-Pupil Interaction". The Harvard Educational Review, 26:315-342.

5. Flanders, N. A.
   1963 "Teacher Behavior and In-Service Programs". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J.B. 256-261.

6. Flanders, N. A.
   1965 Teacher Influence, Pupil Attitudes, and Achievement. U. S., Cooperative Research Monograph No. 12.

7. Fruchter, B.
   1954 Introduction to Factor Analysis.

8. Hough, J. B.
   1967 "An Observational System for the Analysis of Classroom Instruction". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J.B. 150-157.

9. Kocherodorfer, L. H.
   1967 "The Development of a Student Checklist to Determine Classroom Teaching Practices in High School Biology", Research and Curriculum Development in Science Education. Edited by Lee, A. E., 71-78.

10. LaShier, W. S.
    1972 "Changes in Classroom Practices of ISCS Teachers".

11. Lewin, K., R. Lippitt and R. White
1939 "Patterns of Aggressive Behavior in Experimentally Created 'Social Climates'". Journal of Social Psychology, 10:271-299.

12. Lovell, Adrian
1969 "40 Questions on the ISCS Program", Intermediate Science Curriculum Study, Tallahassee, Florida.

13. Ost, D. H. and A. B. Swanson
1968 "Science Classroom Activity Checklist".

14. Pankratz, R.
1967 "Verbal Interaction Patterns in the Classrooms of selected Physics Teachers". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J. B. 189-209.

15. Storlie, T. R.
1963 "Applications of Interaction Analysis to the In-Service Training of Teachers". Interaction Analysis: Theory Research and Application. Edited by Amidon, E. J. and Hough, J. B. 262-270.

16. Withall, J.
1949 "The Development of a Technique for the Measurement of Social-Emotional Climate in Classrooms". Interaction Analysis: Theory, Research and Application. Edited by Amidon, E. J. and Hough, J. B. 47-64.

BIBLIOGRAPHY

Amidon, Edmund J. and Flanders, Ned A. The Role of the Teacher In the Classroom. Minneapolis: Paul S. Amidon and Associates, Inc., 1963.

Amidon, Edmund J. and Hough, John B. (eds.) Interaction Analysis: Theory, Research, and Applications. Reading, Massachusetts: Addison-Wesley Publishing Company, 1967.

Anderson, Harold H. "The Measurement of Domination and of Socially Integrative Behavior in the Teachers' Contacts With Children", Child Development, 10, 1939, 73-89.

Barr, Arvil S. "The Measurement and Prediction of Teaching Efficiency, A Summary of Investigations", Journal of Experimental Education, 26, June 1948, 203-283.

Barr, Arvil S. "The Measurement and Prediction of Teacher Efficiency", Review of Educational Research, 26, June 1946, 203-208.

Burkman, Ernest. "ISCS: An Individualized Approach to Science Instruction", The Science Teacher, 37:9, December 1970.

Cogan, Morris L. "Theory and Design of a Study of Teacher-Pupil Interaction", The Harvard Educational Review, 26, Fall, 1956, 315-342.

Flanders, Ned A. Teacher Influence, Pupil Attitudes, and Achievement. U. S., Cooperative Research Monograph No. 12. Washington, D. C.: Government Printing Office, 1965.

Fruchter, Benjamin. Introduction to Factor Analysis. Princeton, New Jersey: D. Van Nostrand Company, Inc., 1954.

Hall, Gene E. "The Instrument for the Analysis of Science Teaching, A System for Measuring Teaching Behavior". ERIC Ed 041 843. Texas University, Austin.

Hart, Frank W. Teachers and Teaching. New York: The Macmillan Company, 1934.

Kochendorfer, Leonard H. "The Development of a Student Checklist to Determine Classroom Teaching Practices in High School Biology". Research and Curriculum Development in Science Education, edited by A. E. Lee, Austin Texas: University of Texas, 1967, 71-78.

LaShier, William S., Jr. "Changes in Classroom Practices of ISCS Teachers", (paper presented at the Annual Meeting of the Association for the Education of Teachers in Science, New York, New York, April 1972).

LaShier, William S., Jr. "Final Report on the NSF-CCSS Grant-GW4164 Conducted at Kansas State Teachers College in 1969-1970". ERIC Ed 045 423. University of Kansas, Lawrence.

LaShier, William S., Jr. "Final Report on the NSF-CCSS Project for ISCS Teachers held at the University of Kansas, 1971-1972". ERIC Ed 066 300. University of Kansas, Lawrence.

Leeds, Carroll H. "A Scale for Measuring Teacher-Pupil Attitudes and Teacher-Pupil Rapport", Psychological Monographs, 64 (Number 6, Whole Number 312), 1950, 1-24.

Lewin, Kart; Lippitt, Ronald and White, Ralph K. "Patterns of Aggressive Behavior in Experimentally Created 'Social Climates'", Journal of Social Psychology, 10, May 1939, 271-299.

Lovell, Adrian. "40 Questions on the ISCS Program", Intermediate Science Curriculum Study, Tallahassee, Florida, 1969.

Ost, D. H. and Swanson, A. B. "Science Classroom Activity Checklist", Iowa City, Iowa: University of Iowa, March 1968.

Sandefur, J. T. "Kansas State Teachers College Experimental Study of Professional Education for Secondary Teachers", Journal of Teacher Education, 21, Fall 1970, 386-395.

Rolfe, J. F. "The Measurement of Teaching Ability: Study Number Two", Journal of Experimental Education, 14, September 1945, 52-74.

Rostker, Leon E. "The Measurement of Teaching Ability: Study Number One", Journal of Experimental Education, 14, September 1945, 6-51.

Rostker, Leon E. "A Method for Determining Criteria of Teaching Ability in Terms of Measurable Pupil Changes", Educational Administration and Supervision, 28, January 1942, 1-19.

APPENDIX

May 18, 1971

To: ISCS Teachers

From: Dr. Robert James, Workshop Director

May I take this opportunity to express my appreciation to you for your cooperation in collecting the data on student subject preferences in your class. It is my hope that this information will be quite helpful in reaching an assessment of the ISCS program. I recognize that it has taken considerable time out of your schedule and I appreciate your willingness to do it.

May I ask one more favor of you? Would you be willing to administer the ISCS classroom procedures checklist to your students? I have discussed this with your principal and he has given his O.K. We are trying to determine how the student feels about what went on in his science classroom. I recognize that the kinds of questions included may be a threat to some teachers. May I assure you that the information about your class will be entirely confidential and will not be communicated along with your name to your school district. It is my hope with this instrument to be able to relate what happens within the classroom to how the classroom was conducted. We have included items from a number of areas, including the student's perception of his relationship to his teacher, how the teacher handles questions the student has, the amount of freedom allowed to students, how students are evaluated, how the nature of science is reflected in this classroom and classroom management as it relates to the availability of equipment and supplies.

A pilot with 24 ninth grade students indicated that better students will be able to finish this instrument in 15 minutes. Obviously, with 7th graders and lower reading levels, more time will be required. It is my hope that it can be completed within 30 minutes.

May I add one more thing? May I ask you to take a non-threatening position with respect to your students on this instrument in the following ways? (1) Would you assure them that this instrument will in no way affect their grades? (2) Would you ask a student to pass out and collect these papers and have him deliver them directly to the principal? I believe in this way students can be encouraged to answer questions frankly without the fear that the teacher may evaluate them on the basis of this instrument.

Again, I realize this amounts to considerable inconvenience, but I trust that the results will be valuable to your school and to other schools who are trying to decide whether or not they should adopt ISCS. Thanks for your help.

RJ:mcs

ISCS Classroom Procedures Checklist

The purpose of this checklist is to determine how well you know what is going on in your science class. Each statement describes some classroom activity. The activities are not judged as either good or bad. Therefore, this checklist is NOT a test. Your answers will in no way affect your grade.

You are asked to read the following statements and judge whether the statement is generally true about your science classroom. If it is, check the "Yes" column at the right. If it is not generally true, check the "No" column. If you have trouble deciding, please select the answer which you feel is most true.

Thanks for your help!

Name_____ Date_____

Grade_____ Sex M F Teacher_____
(Circle one)

		Yes	No
1.	I generally feel at ease in this classroom	1. ___	___
2.	My teacher is willing to help me with things other than science	2. ___	___
3.	My teacher praises students when they do well.	3. ___	___
4.	Our teacher is easy to make friends with.	4. ___	___
5.	I am sometimes afraid to ask my teacher a question about science.	5. ___	___
6.	My teacher shows a sense of humor in class.	6. ___	___
7.	We never have the chance to try our own ways of doing the laboratory work.	7. ___	___
8.	We often have a chance to discuss the conclusions that we have found in the laboratory	8. ___	___
9.	Small groups of us often discuss results of completed experiments with our teacher	9. ___	___
10.	The teacher explains all unusual results that happen in the laboratory.	10. ___	___
11.	My teacher uses my ideas, questions, or points of view when I have questions about science.	11. ___	___
12.	If there is a discussion among students, the teacher usually tells us who is right.	12. ___	___
13.	In lab work when we discover facts that don't fit, we usually throw them out.	13. ___	___
14.	My teacher often asks questions that cause me to think about why a statement is made in the textbook.	14. ___	___
15.	Our tests often ask us to write our definitions of terms.	15. ___	___
16.	My teacher sometimes uses questions to answer the questions students ask.	16. ___	___

		Yes	No
17.	Our teacher often answers his own questions.	17. ___	___
18.	Our tests include many questions based on things that we have learned by doing experiments.	18. ___	___
19.	Our tests often give us sets of facts collected and ask us to draw conclusions from these.	19. ___	___
20.	Our tests often ask us to figure out answers to new problems.	20. ___	___
21.	In explaining problems or answering questions my teacher often repeats exactly what the textbook says.	21. ___	___
22.	Our teacher often draws small groups of students together to discuss problems, or review ideas related to the text.	22. ___	___
23.	Our teacher sometimes talks to the entire class about science.	23. ___	___
24.	Some days the class takes a break and talks about current events, watches films or does other things not related to the book.	24. ___	___
25.	We are seldom told what to do by our teacher.	25. ___	___
26.	We are frequently required to write our definitions to words.	26. ___	___
27.	My teacher usually tells us step-by-step what we are to do in the laboratory.	27. ___	___
28.	My teacher usually begins class by giving us brief directions related to the science we are studying.	28. ___	___
29.	My teacher doesn't like to admit his mistakes.	29. ___	___
30.	When I do my best, this is usually good enough for my teacher.	30. ___	___
31.	Our teacher often tells students to read the directions more carefully.	31. ___	___
32.	My teacher often asks me to explain the meaning of certain things in the text (during discussion).	32. ___	___
33.	My teacher moves from student to student, giving clues and discussing science ideas.	33. ___	___

		Yes	No
34.	My teacher asks questions that cause us to think about things that we have learned in other chapters.	34. ___	___
35.	If I don't agree with what my teacher says, he wants me to say so.	35. ___	___
36.	We often ask the teacher if we are doing the right thing in our experiments.	36. ___	___
37.	We are often allowed to talk among ourselves about ideas in science during class.	37. ___	___
38.	We are discouraged from discussing our work with other students.	38. ___	___
39.	My teacher encourages me to discuss my work with other students.	39. ___	___
40.	Most of the questions that we ask in class are to clear up what the teacher or text has told us.	40. ___	___
41.	The facts that I collect are often different from facts that are collected by other students.	41. ___	___
42.	After every lab session, we compare the facts that we have collected with the facts of other individuals or groups.	42. ___	___
43.	I am expected to understand what to do before I start a new experiment.	43. ___	___
44.	My teacher expects me to work faster than I am able to work.	44. ___	___
45.	When reading the textbook, we are always expected to look for the main ideas and for the facts that support them.	45. ___	___
46.	When reading the text, we are expected to learn most of the details that are stated there.	46. ___	___
47.	We are sometimes asked to design our own experiment to answer a question that puzzles us.	47. ___	___
48.	Usually we record our facts while doing an experiment.	48. ___	___
49.	The teacher expects each student to do his own work and write down his own answers.	49. ___	___

		Yes	No
50.	I take tests often enough so that I know how well I am understanding the science materials.	50. ___	___
51.	The room is arranged so that I can find the equipment easily.	51. ___	___
52.	The equipment I need for experiments is usually conveniently available.	52. ___	___
53.	Our teacher often grades our laboratory books for neatness.	53. ___	___
54.	Most of our grade comes from chapter tests.	54. ___	___
55.	My grade in this class is based mostly on how I do on the tests.	55. ___	___
56.	My teacher often checks just part of my laboratory work.	56. ___	___
57.	I am usually expected to evaluate my own learning by taking ungraded tests.	57. ___	___
58.	We are allowed to go beyond the regular lab exercise and do some experimenting on our own as long as it is not dangerous.	58. ___	___
59.	We often use the laboratory to investigate a problem that comes up in the class.	59. ___	___
60.	Many of the experiments that are in the laboratory manual are done by the teacher or other students while the class watches.	60. ___	___
61.	Our teacher is often busy grading papers or doing some other paper work while we are working in the laboratory.	61. ___	___
62.	We usually know the answer to laboratory problems that we are investigating before we begin the experiment.	62. ___	___
63.	Our teacher has tried to teach us to question what the textbook says.	63. ___	___
64.	Our teacher insists that we keep busy during the class period.	64. ___	___

		Yes	No
65.	I am expected to work at my own speed even though the rest of the class may be several chapters ahead or behind in the text.	65. ___	___
66.	Our teacher generally keeps track of our progress.	66. ___	___
67.	Our teacher often tells us to be quiet during class.	67. ___	___
68.	I am usually free to decide whether or not I do an Excursion (extra work).	68. ___	___

The Scoring of the Questionnaire

The scoring was recorded on eighty column IBM cards with the columns allocated as follows:

column one.....teacher identification number.

column two-four.....student identification number.

column five.....student's sex, male 0, female 1.

column six-eight.....blank

column nine-seventy six.....answers, yes 0, no 1.

Each questionnaire was scored by totaling the number of computer recorded "correct" answers. The answers were programmed as follows: questions 5, 7, 10, 12, 13, 15, 17, 21, 23, 24, 26, 27, 28, 29, 36, 38, 42, 44, 46, 53, 54, 55, 60, 61, 62, and 67 were considered correct if answered no; the balance of the questions were considered correct if answered yes. The no answers considered correct were converted to yes by the computer and were included in the total score for each questionnaire. For example, in question five if the student answered no the computer recognized the no, considered it answered correctly and converted the no to the yes coding for scoring. If the student had answered question five yes, then the answer would have been converted to the no coding.

ILLEGIBLE DOCUMENT

THE FOLLOWING DOCUMENT(S) IS OF POOR LEGIBILITY IN THE ORIGINAL

THIS IS THE BEST COPY AVAILABLE

ROTATED FACTOR MATRIX

VARIABLE	FACTOR 1	2	3	4	5	6	7	8	9	10
1	0.47347	-0.03307	0.00047	0.03802	-0.06271	0.03503	0.04401	-0.08416	-0.11505	-0.10228
2	0.16429	0.78975	-0.04924	-0.42746	-0.00796	-0.27775	-0.11184	-0.18107	0.03475	0.05086
3	0.32251	0.31357	0.20917	-0.22605	-0.15404	-0.07520	0.00347	-0.09981	0.04155	0.03137
4	0.66748	0.16028	0.06210	-0.23215	-0.17628	0.02382	0.08540	0.08773	-0.03999	0.07508
5	-0.29689	-0.30409	0.00469	-0.03648	0.10364	-0.28625	-0.02609	0.16412	-0.00440	-0.18516
6	0.50695	0.01527	0.14022	-0.03917	0.07914	-0.00118	-0.00359	-0.09784	0.04908	0.06911
7	0.00582	-0.08179	0.08619	0.02553	0.06091	0.45889	0.04948	-0.12308	-0.31117	0.09268
8	0.20954	-0.10361	0.29506	-0.30461	0.14792	0.07511	-0.05163	-0.13142	0.27335	-0.01194
9	0.18107	0.34269	0.26501	-0.48223	0.11917	0.07262	0.00698	-0.15459	0.09003	-0.06857
10	0.21294	0.10949	0.35670	-0.17215	0.09374	-0.12621	0.09805	-0.23827	0.14423	-0.05674
11	0.31115	0.37533	-0.07909	-0.15154	-0.12881	-0.06864	-0.06332	-0.23034	0.00328	0.22566
12	0.28362	0.12726	0.07647	-0.01503	-0.04032	-0.00429	-0.07411	-0.03584	-0.01706	0.48154
13	-0.18278	0.05986	0.01916	0.13373	-0.24048	-0.25017	0.10006	0.01483	-0.03610	-0.16293
14	0.13844	-0.18049	-0.04058	-0.25343	0.07328	-0.45948	0.10845	0.02011	0.28706	0.39068
15	0.05147	0.10216	-0.13032	-0.23952	0.00671	0.15465	0.12870	-0.47585	0.06152	-0.09096
16	0.42621	-0.09886	0.14354	-0.16100	0.15038	-0.13637	-0.19118	0.01865	0.01726	0.03760
17	0.03496	0.08354	-0.08620	-0.09407	0.52628	-0.03519	-0.11522	0.02378	0.03954	-0.05509
18	0.13912	0.00584	0.22764	0.00202	-0.12650	-0.35894	0.41743	0.01116	-0.08138	0.18409
19	0.07439	0.27424	0.11121	-0.15882	-0.17373	0.03177	0.23818	-0.23475	0.00918	-0.08458
20	-0.07656	0.39643	0.12073	-0.04419	0.09551	-0.28502	-0.08042	-0.18901	0.06926	0.14460
21	0.04851	-0.06881	0.47597	0.21065	-0.02599	-0.19961	0.05238	-0.13366	0.10989	-0.02112
22	0.03953	0.04981	-0.10914	-0.52187	0.02333	0.02964	0.21091	-0.14623	0.13660	-0.01911
23	0.30316	-0.13619	-0.03216	0.06799	0.11793	-0.02517	0.10530	-0.36853	0.17357	0.08942
24	0.25200	-0.00819	0.16300	0.48789	0.15226	-0.13697	0.13005	0.10640	0.04732	-0.16923
25	0.11470	0.05438	0.14300	-0.00278	0.35820	-0.01951	-0.01700	-0.08214	-0.64970	-0.15503
26	-0.04438	-0.06536	0.12495	-0.25683	0.02111	0.03302	0.08072	-0.56325	-0.09029	0.01023
27	0.10640	0.15478	0.07503	0.06135	0.15947	-0.06514	-0.23079	-0.21946	0.31269	0.17523
28	0.07562	-0.27361	-0.12673	-0.26681	0.00088	-0.00095	0.06385	-0.09023	0.52624	0.08110
29	-0.25141	-0.06279	0.25820	0.33918	-0.09326	0.12267	-0.03479	-0.28655	0.15379	-0.24598
30	0.61271	0.10991	-0.13514	0.03521	-0.00610	0.03190	0.15608	0.09870	0.17828	-0.04954
31	0.19537	-0.42738	0.11394	-0.16742	0.07061	-0.39682	-0.09146	-0.18920	-0.04535	0.12332
32	0.00560	-0.07209	0.07023	-0.33455	-0.03642	-0.21573	-0.07034	-0.44908	0.15683	0.13853
33	0.28616	0.12359	0.01063	-0.13669	-0.17009	-0.10285	0.25811	-0.18621	0.26515	-0.24985
34	0.30193	-0.12447	0.18017	-0.24151	0.04179	-0.31449	0.17348	0.15412	0.19607	0.14103
35	0.39047	0.05670	-0.04456	-0.19529	-0.16128	-0.05266	0.07788	-0.11911	0.16391	0.13459
36	0.27348	0.11782	0.22024	-0.18217	0.02085	-0.33192	0.25125	0.09602	-0.09310	0.04728
37	0.46399	0.26233	0.15775	-0.06054	-0.26598	-0.13049	0.29573	0.00944	-0.04174	-0.08751
38	-0.37796	0.23775	-0.00147	0.12687	0.02386	0.14108	-0.01188	-0.30586	0.12182	0.09519
39	0.24773	0.10727	0.04162	-0.25144	0.01304	-0.26082	0.00182	-0.00542	-0.12313	-0.07278
40	0.33117	-0.11697	-0.00959	0.03383	-0.22253	-0.19723	0.10269	-0.16868	0.45319	0.08636
41	-0.04947	-0.02147	-0.03162	0.02836	-0.03630	0.09357	0.61529	-0.02529	0.00753	-0.03241
42	0.00572	0.28845	0.31729	-0.23593	0.26254	-0.05345	-0.02276	-0.11087	0.02081	-0.15313
43	-0.08720	0.05034	0.02145	0.01866	-0.04859	-0.15459	-0.02002	-0.08409	0.11531	0.52603
44	-0.44834	-0.03609	0.13055	0.16853	-0.11444	-0.04505	0.06991	-0.08259	-0.09239	-0.00928
45	0.12085	0.01952	-0.04063	0.05232	0.21661	-0.48739	0.06786	-0.17243	0.07069	0.12558
46	0.04544	0.14594	0.07647	0.34525	0.09840	-0.24644	-0.05093	-0.35736	-0.03170	0.10577
47	0.05907	0.12625	0.01591	-0.30081	0.16737	-0.02098	-0.09374	0.03867	0.28547	-0.29162
48	0.22448	-0.00219	-0.10259	-0.14965	0.13271	-0.08284	0.52776	-0.13563	-0.03947	-0.00092
49	-0.04014	-0.07479	0.34307	0.03372	-0.03930	0.00045	0.14500	0.26607	-0.04578	0.35041
50	0.20917	0.05691	-0.07302	-0.22017	0.20788	0.00487	0.27691	-0.00736	0.13780	0.22290
51	0.42254	-0.16772	0.03660	0.05187	0.25951	-0.06227	0.05822	-0.12045	-0.04215	0.09619
52	0.48324	0.33073	0.06980	0.01201	0.23471	-0.01512	-0.00570	-0.03558	0.16139	-0.01444
53	-0.06265	0.77352	-0.02775	-0.22186	0.02687	0.01282	0.00363	-0.01264	-0.03990	0.10770
54	0.04242	0.44137	0.38994	-0.04228	0.07400	0.25158	-0.13052	-0.03724	-0.05475	0.07028

55	-0.00734	0.09162	0.56516	0.01405	-0.06429	0.21154	-0.16501	0.11476	0.02849	0.08211
56	-0.16665	-0.16591	-0.09371	0.11552	0.36578	-0.11395	0.14232	-0.03279	0.09515	0.04550
57	0.05188	0.14417	0.01671	-0.45103	-0.05984	0.09184	0.09231	-0.01914	0.12217	0.06428
58	0.07467	0.63574	-0.10197	-0.08015	0.15143	0.01734	-0.05877	0.10977	0.31364	-0.16151
59	0.10758	0.13766	0.19567	-0.44388	0.14977	0.06392	0.16039	0.01258	0.31070	0.15293
60	-0.04389	0.21135	0.15451	-0.05888	-0.09934	-0.08946	-0.05969	-0.05723	0.38733	0.02383
61	-0.01496	0.03581	0.29964	0.16624	0.44165	0.14639	0.24943	0.01746	-0.07376	0.00940
62	-0.11694	0.76656	0.01237	0.04009	0.11716	0.15528	0.04720	0.13990	0.46183	0.02891
63	0.28166	0.07457	0.10660	-0.08889	0.03756	-0.05584	-0.07491	-0.15864	0.32303	0.09522
64	0.00499	-0.15394	0.07255	0.09255	0.09925	0.44751	-0.05465	0.03357	-0.05182	0.10943
65	0.38474	0.76640	0.26690	0.00580	0.03754	0.11921	0.23037	0.01931	-0.05017	0.03867
66	0.26728	0.07255	0.21055	-0.05169	0.33721	0.02364	0.26196	0.14322	0.16794	0.28827
67	-0.04634	-0.18698	0.20862	0.43935	-0.07441	0.02849	0.21103	0.12368	0.11126	0.17686
68	0.13915	0.68501	0.07392	0.04030	0.01114	0.10634	0.10735	0.01440	0.09861	0.03086

Biology Classroom Activity Checklist (#9, p. 74-76)

SAMPLE QUESTION
Checklist

Answer Sheet

	T	F
1. My teacher often takes class attendance.	1. ( )	( )

If the statement describes what occurs in your classroom, blacken the space under the letter T (TRUE) on answer sheet; if it does not, blacken in the space under the letter F (FALSE).

REMEMBER:

1. The purpose of the checklist is to determine how well you know what is going on in your classroom.
2. Make no marks in this booklet.
3. All statements should be answered on the answer sheet by blackening in the space under the chosen response in pencil or ink.
4. Please do not write your name on this booklet or answer sheet.

SECTION A

1. Much of our class time is spent listening to our teacher tell us about biology.

2. My teacher doesn't like to admit his mistakes.

3. If there is a discussion among students, the teacher usually tells us who is right.

4. My teacher often repeats almost exactly what the textbook says.

5. My teacher often asks us to explain the meaning of certain things in the text.

6. My teacher shows us that biology has almost all of the answers to questions about living things.

7. My teacher asks questions that cause us to think about things that we have learned in other chapters.

8. My teacher often asks questions that cause us to think about the evidence that is behind statements that are made in the textbook.

SECTION B

1. My job is to copy down and memorize what the teacher tells us.

2. We students are often allowed time in class to talk among ourselves about ideas in biology.

3. Much of our class time is spent in answering orally or in writing questions that are written in the textbook or on study guides.

4. Classroom demonstrations are usually done by students rather than by the teacher.

5. We seldom or never discuss the problems faced by scientists in the discovery of a scientific principle.

6. If I don't agree with what my teacher says, he wants me to say so.

7. Most of the questions that we ask in class are to clear up what the teacher or text has told us.

8. We often talk about the kind of evidence that is behind a scientist's conclusion.

SECTION C

1. When reading the text, we are expected to learn most of the details that are stated there.

2. We frequently are required to write out definitions to word lists.

3. When reading the textbook, we are always expected to look for the main problems and for the evidence that supports them.

4. Our teacher has tried to teach us how to ask questions of the text.

5. The textbook and the teacher's notes are about the only sources of biological knowledge that are discussed in class.

6. We sometimes read the original writings of scientists.

7. We are seldom or never required to outline sections of the textbook.

SECTION D

1. Our tests include many questions based on things that we have learned in the laboratory.

2. Our tests often ask us to write our definitions of terms.

3. Our tests often ask us to relate things that we have learned at different times.

4. Our tests often ask us to figure out answers to new problems.

5. Our tests often give us new data and ask us to draw conclusions from these data.

6. Our tests often ask us to put labels on drawings.

SECTION E

1. My teacher usually tells us step-by-step what we are to do in the laboratory.

2. We spend some time before every laboratory in determining the purpose of the experiment.

3. We often cannot finish our experiments because it takes so long to gather equipment and prepare solutions.

4. The laboratory meets on a regularly scheduled basis (such as every Friday).

5. We often use the laboratory to investigate a problem that comes up in class.

6. The laboratory usually comes before we talk about the specific topic in class.

7. Often our laboratory work is not related to the topic that we are studying in class.

8. We usually know the answer to a laboratory problem that we are investigating before we begin the experiment.

SECTION F

1. Many of the experiments that are in the laboratory manual are done by the teacher or other students while the class watches.

2. The data that I collect are often different from data that are collected by the other students.

3. Our teacher is often busy grading papers or doing some other personal work while we are working in the laboratory.

4. During an experiment we record our data at the time we make our observations.

5. We are sometimes asked to design our own experiment to answer a question that puzzles us.

6. We often ask the teacher if we are doing the right thing in our experiments.

7. The teacher answers most of our questions about the laboratory work by asking us questions.

8. We spend less than one-fourth of our time in biology doing laboratory work.

9. We never have the chance to try our own ways of doing the laboratory work.

SECTION G

1. We talk about what we have observed in the laboratory within a day or two after every session.

2. After every laboratory session, we compare the data that we have collected with the data of other individuals or groups.

3. Our teacher often grades our data books for neatness.

4. We are required to copy the purpose, materials, and procedure used in our experiments from the laboratory manual.

5. We are allowed to go beyond the regular laboratory exercise and do some experimenting on our own.

6. We have a chance to analyze the conclusions that we have drawn in the laboratory.

7. The class is able to explain all unusual data that are collected in the laboratory.

AN INSTRUMENT FOR THE ANALYSIS OF INTERMEDIATE SCIENCE CURRICULUM STUDY TEACHER BEHAVIOR

by

JEANNETTE McCORKLE RICHMOND

B.S., Iowa State University 1963

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

College of Education

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1973

The Intermediate Science Curriculum Study (ISCS) stressed more personal, one-to-one teacher-pupil interactions. This required an adjustment and familiarization on the part of the teacher. The objective of this study was to create an instrument that accurately relayed through student answers whether the teacher had adopted the ISCS desired teacher behavior for teaching science in the junior high school.

The instrument was devised by using behavior categories defined by Ned Flanders (1965), ISCS (1969) desired characteristics of teacher behavior, a science-oriented activity checklist and the instruments developed by Kochendorfer (1968) and LaShier (1971). It was administered to a group of four hundred seventh graders from Harper and Liberal, Kansas, scored by computer and analyzed by Factor Analysis, Biomedical Computer Program BMDX72, University of California Publications. After interpretation, eighteen items were eliminated and the remaining fifty items loaded onto two factors. Factor one appeared to examine a teacher's personal rapport with students; factor two appeared to deal with classroom management.

Reliability tests, using the odd-even method, were run and showed a coefficient of 0.7957 for the fifty items; factor one 0.6448 and factor two 0.6261. The reliability coefficients indicated the instrument should undergo revision.