DOCUMENT RESUME

ED 021 337 24 EA 001 593

THE NORTH CAROLINA ADVANCEMENT SCHOOL: "THE DEVELOPMENT AND EVALUATION OF A SCHOOL FOR HIGH POTENTIAL UNDERACHIEVERS," 1964-1967. FINAL REPORT.

Learning Institute of North Carolina, Durham.
Spons Agency-Office of Education (DHEW), Washington, D.C. Bureau of Research.
Report No-CRP-H-173
Bureau No-BR-5-0674
Contract-OEC-5-10-209
Note-193p.
EDRS Price MF-$0.75 HC-$7.80
Descriptors-AUDIOVISUAL AIDS, COMMUNICATION SKILLS, *CURRICULUM DEVELOPMENT, EDUCATIONAL INNOVATION, *EDUCATIONAL TESTING, *EXPERIMENTAL CURRICULUM, FIELD STUDIES, GEOLOGY, GRADE 8, *INSERVICE TEACHER EDUCATION, INSTRUCTIONAL PROGRAMS, PHYSICAL EDUCATION, PROBABILITY, PROBLEM SOLVING, REMEDIAL READING, STATE PROGRAMS, TEACHER ROLE, *UNDERACHIEVERS
Identifiers-*North Carolina Advancement School

The North Carolina Advancement School was established in 1964 to study educational underachievement and to develop and disseminate methods and materials which the state's public schools might use to combat underachievement. It was operated as a private residential school for eighth grade underachieving boys from the public schools of the state. During its initial period it accommodated 2,323 boys and 252 visiting teachers who obtained inservice education on the problems of underachievement. The Advancement School developed and field tested learning programs in communications, geology, probability and problem-solving, remedial reading, and physical education. These programs were shown to be effective both at the Advancement School and with underachievers and other students in a representative selection of the public schools of the state. Descriptions of procedures followed and materials and tests used in the field testing program are appended. (Authors/JK)

# THE NORTH CAROLINA ADVANCEMENT SCHOOL 1964 - 1967




*A project of The Learning Institute of North Carolina*

FINAL REPORT

On The

NORTH CAROLINA ADVANCEMENT SCHOOL

"The Development and Evaluation of a School for High Potential Underachievers"

1964 -- 1967

(USOE Cooperative Research Project #H-173)

# *Dissemination Task Force Final Report*
# *APPENDIX A*

Submitted To: The United States Commissioner of Education

The North Carolina State Board of Education

Carnegie Corporation of New York

Submitted By: The Learning Institute of North Carolina
1006 Lamond Avenue,
Durham, North Carolina 27701

The Research Reported Herein Was Supported Through The Cooperative Research Program Of The United States Office of Education, Department of Health, Education and Welfare; The North Carolina State Board of Education; And Carnegie Corporation of New York

APPENDIX A

# FINAL REPORT

# of a

# DISSEMINATION TASK FORCE

## To Field Test Materials and Methods Developed By The North Carolina Advancement School And To Provide In-Service Training for Teachers In The Public Schools of The State

Submitted by:

The Learning Institute
of North Carolina

TABLE OF CONTENTS

# SECTION I

## GENERAL NARRATIVE

In October, 1966, the Learning Institute of North Carolina was awarded an $85,000 grant to field test in public schools materials that had been developed and used successfully at the North Carolina Advancement School. The purpose of this report is to describe that program and its results, along with the results of an extensive testing program which was conducted as part of the field testing program. These results and an interpretation of the results are included in the following section entitled, "The Field Testing Assessment Program." This section is restricted to a brief description of how the field testing program was organized and executed and a subjective reaction concerning its success. A detailed description of two of the units is given in Appendices D and E.

North Carolina has a high dropout rate. In 1961, North Carolina ranked 44th among the states in the percentage of failures on the selective service tests. The North Carolina Advancement School was established in 1964 to help alleviate problems such as these through the development of methods and materials which could be used effectively in the public schools of the state. As a residential educational research center, the School brought eighth grade underachieving boys to the facility for a three-month stay. In its initial three-year operation, the School accepted 2331 students from 134 of the 168 school units in the state. At the same time, 260 public school

teachers participated in a teacher-training program which was conducted during each three month session.

It was apparent to the "founding fathers" of the School that the project had to reach more students and teachers than could come to the School if an impact was to be made on the public school system at large. Also, it is not economically practical to establish additional residential schools to solve the problems of all under-achievers. Methods and materials which could be used effectively in a public school setting had to be developed. Effective ways to disseminate this information had to be discovered. It was reasoned that if ways could be found to educate underachievers-the most difficult students to teach-such procedures could likely be used effectively in heterogenous classes.

During the first year of the Advancement School's existence, no "packages" were developed. Rather, the staff of the School was empirically noting what seemed to work best for underachievers in a residential setting. These notions were substantiated by test scores and follow-up studies of students. From that first year's effort, the staff concluded that programs which were "experientially" taught were most effective. Consequently, a series of units and courses was evolved on the basis of day-to-day classroom contact with underachievers during the second year of the School's operation. A similarity of approach runs through all of the units. In general, the students move from areas of immediate interest and experience-whether flipping a coin in the math probability unit, viewing a movie in the Communications unit, or performing an experiment in the Science Geology unit-to generalizations or abstractions which they must formulate for themselves. Every

unit designed at the School has implicit in it a method of looking at teaching, a way of viewing education. The units do not consist solely of subject matter; rather, they are introduced, organized, and written so as to demand the same teaching techniques which proved effective at the Advancement School. The research effort, therefore, involved the assessment of the effectiveness of the materials with students as well as their effectiveness as a teacher training device in the local school setting.

Basic to the field testing program is the question of how to effect change. New curricula are being developed in many places and, in some cases, with no thought as to how to get the teachers to use them. It has been said that most teachers teach as they have been taught. America is undergoing a period of rapid change, and teaching methods which were effective in the recent past may not be effective today. Mass media and increased mobility have created a more sophisticated student who demands that education be made more relevant to his life.

Research has indicated that most people don't change values or patterns of behavior simply by knowing about alternatives. Situations must be created whereby one examines his behavior, compares it with alternatives and then commits himself to a better alternative. Of importance in the field testing program was the belief that teachers, as well as students, learn best experientially.

Another reason for using the field testing experience as a teacher-training device was that the Visiting Teacher Program conducted by the Advancement School, one in which teachers left their

home schools for three months during the school year to come to the School for in-service training, had never been successful in attracting large numbers of teachers because of the problem of the local schools finding good substitute teachers. The field testing program was seen as a way to bring the Advancement School to public school teachers.

There were two phases in the field testing program. Phase I, conducted in the fall of 1966, was exploratory. Phase II, conducted in the winter and spring of 1967, was a more definitive effort involving more teachers and students, and an evaluation which was more rigorous and thorough. The purpose of Phase I was primarily to find out what the "mechanical" problems of field testing would be and to get some subjective reactions to the materials. No formalized testing was done. The purpose of Phase II was to determine in a systematic way the extent to which using the materials effects the attitudes and achievement of students and the teaching behavior of instructors, and to compare the units with materials presently used in the public school system. (Appendix A gives a statistical view of the field testing program.)

Weekend conferences were conducted before and after the field testing experiences to discuss the materials with the participating teachers. At the conferences, the materials to be field tested were reviewed very thoroughly and the rationale for the materials was given. In many cases, demonstration classes with Advancement School students were taught. The purpose of the conferences was not only to interest the teachers in the materials (some were

requested to attend while others volunteered), but also to familiarize the teachers with the materials to the extent so they would feel comfortable using them. At the close of the preliminary conferences, the teachers were given the materials to take home.

Most teachers returned the materials they had field tested when they attended the follow-up conferences. Those who continued to field test retained them. Additionally, teachers who requested the opportunity to keep the materials they had tested were, in most cases, allowed to do so. At the follow-up conferences, the teachers reviewed their experience with each lesson and made recommendations for changes. These recommendations, coupled with the daily observation sheets and the field representative's suggestions, provided specific information which was used in improving the materials.

---

The fall phase of the field testing lasted from September, 1966 through January, 1967. During that time, field representatives from the Advancement School visited the participating teachers about once a week to observe classes using the materials and to discuss with the teachers their effectiveness. It was emphasized to the teachers that the role of the field representative was to be of assistance and not necessarily to evaluate the performance of the teacher. The field representatives concluded that their acceptance and the non-threatening role they played was crucial in the establishme

of good rapport with the teachers. All of the field representatives were former public school teachers in North Carolina.

Because the materials were being tested throughout the state, many thousands of miles were driven by the field representatives.

The testing could have been simplified had it been done in a restricted geographical area. However, as the Advancement School was a state-wide program and because one of its objectives was to encourage innovative efforts throughout the state, the testing of materials purposely was scattered from one end of the state to the other and in a variety of settings. In most cases, the representatives took with them films, books and other materials which rotated from teacher to teacher as the number of teachers exceeded the number of copies of many items.

Teachers completed daily observation sheets regarding their experiences. School principals and local school supervisors were asked for their observations not only about the overall operation of the program but also with reference to specific changes in teachers' approaches to their assignments. This information, subjectively gathered, indicated what changes needed to be made in content and method prior to the initiation of the winter-spring (Phase II) field testing. Many revisions were made. However the fall field testing teachers were generally very satisfied with the materials. Students were also generally enthusiastic about them.

A comment needs to be made about the costs of the materials. It is apparent to anyone who examines them that the most striking difference between the materials and state-adopted materials is the extensive use of audio-visual aids. As stated elsewhere in the report, numerous films, filmstrips, tapes, records, and transparencies were used with each unit. Presently, the cost of each unit is re[illegible]vely high for general classroom use. However, both teachers and students commented favorably about the audio-visual materials. It would be of value to determine how they might be packaged at a competitive cost.

---

Phase II of the field testing program lasted from February through May, 1967. Additional units were added; units tested in the fall were revised and retested. Some of the same teachers continued to use the materials with new classes and new teachers in different schools were added.

There was no problem locating field testing sites. School administrators were very cooperative. They were encouraged to identify a variety of teachers. Although most of the field testing included eighth grade "regular" classes, grade levels ranged from the fifth grade through the junior college level. Some teachers were considered by their principals as very competent and, in fact, were selected because of their enthusiasm

for experimentation. Other teachers were selected for other reasons.

Prior to field testing any materials, the State Superintendent of Public Instruction was contacted regarding the possibility of field testing materials. Subsequent meetings were held between Advancement School representatives and instructional staff of the State Department of Public Instruction. As most subject specialists at the State Department of Public Instruction had been in communication with course developers at the Advancement School, the purpose of these meetings was primarily to clarify the legal aspects of field testing. The State Department of Public Instruction approved the field sites as well as all materials to be field tested, and a State Department staff member was designated as a liaison between the two groups. The Advancement School informed the State Department of its field testing activities.

While the field testing program was considered to be successful, it was not conducted without problems. Among the problems were the following:

1. The written reactions of many teachers to the materials were, in many cases, too inadequate to be helpful. Although efforts were made to eliminate this problem, it continued. In the event field testing is conducted in the future, those conducting the testing should try to work out with the participants an acceptable reporting procedure.

2. The materials which were field tested presently cost too much for general classroom use. However, a competitive cost could be achieved if the materials were produced in quantity, if inadequate a-v aids were eliminated, and if a-v aids were consolidated for more economical production.

3. The formalized testing, in most cases, proved to be inadequate. The accompanying Assessment Report will indicate the extensive testing which was conducted. Those responsible for the field testing program were aware from the beginning of the inadequacy of such instruments as standardized achievement tests to measure such things as attitude improvements, increased interest in classroom work, or altered teaching style. In fact, more time was spent in seeking or developing what, hopefully, would be desirable instruments than any other aspect of the field testing program. Even though an acceptable testing program developed, all involved with the field testing program, i.e., teachers, students, principals, and field representatives feel that such tests were inadequate and that insufficient time elapsed between pre and post testing to note substantial changes in most areas. Three definite suggestions for future field testing efforts are: that considerable attention be given to the procurement of adequate measuring instruments;

that the time between testing be increased, and that a more direct effort to get evidence of change in teaching style and attitudes be undertaken.

4. Many of the principals of the participating schools experienced difficulties in keeping abreast of the activities in the experimental classrooms. School administrators simply do not have the time, in most cases, to visit a given classroom on a regular and frequent basis. Future field testing programs might find it advantageous to try to work out some kind of supervisory mechanism which does not put the burden of work upon the principals.

5. Some field testing teachers, even though advised to the contrary, used the materials being tested with control groups, thus upsetting the research design.

It was suggested earlier in this report that the question of effecting change was fundamental to the field testing program. All who were associated with the field testing program have concluded that the "experience" of field testing is crucial and important. That is, new materials alone do not represent an answer to the problem of effecting change or improving instruction-nor does an in-service training program in which teachers passively discuss needed changes in content and method.

The field testing experience for the participating teachers was effective because 1) they received the satisfaction resulting from participating in the development of materials; 2) the materials

represented a specific educational philosophy which directly confronted the "what" and "how" concerns of the teacher; 3) the participating teachers were placed into a structure which made it necessary for them to examine what they were doing and compare their teaching style with other alternatives.

To school administrators interested in effecting change, the above has obvious implications: 1) Purchasing new and different materials with no consideration given to the problem of altering teachers' teaching methods will likely have little effect. 2) Teacher training programs in which teachers are <u>actively</u> involved in achieving certain goals will likely produce the best results.

Perhaps the most striking point that came out of the field testing program was the crucial role of the teacher in the learning process. New equipment and new materials will undoubtedly continue to flood the market. If, in this process, the teacher who will implement them and be responsible for making them work effectively is forgotten, the best of materials have little hope of bringing about significant positive change.

Much was learned as a result of the field testing experience. The fact that development is expensive and effecting change is enormously difficult was reinforced. Did the Dissemination Task Force accomplish its objectives? How good were the materials? Did the participating teachers profit from the experience? These are the questions which those responsible

for program had to ask. These and other questions are considered in the balance of this report.

The materials were received enthusiastically by both students and teachers. The field testing effort proved beyond doubt that the instructional programs developed in working with underachievers at the North Carolina Advancement School could be disseminated and taught with success in the public sc' ools.

# SECTION II

# RESEARCH ASSESSMENT

# SECTION II
# RESEARCH ASSESSMENT

## I. INTRODUCTION

Other portions of this field testing report describe the various curriculum units and the steps involved in the development of these units. Included also elsewhere in the report are detailed accounts of the way the Advancement School Field Testing staff was organized and of the procedures followed by the staff in working with the various public schools throughout the State that participated in the field testing project.

This part of the report is concerned with a description and analysis of the various measurements used to evaluate the impact of the field test materials on the students and staff members in the cooperating schools. It contains a description of the assessment procedures, the objectives of the various units, the tests and other instruments used to measure outcomes of the teaching efforts, a description of the participating schools and classes, and a presentation of the results of the assessment program.

There are two phases in the assessment process. Phase I, conducted in the fall, 1966 was exploratory. Fifty-seven teachers and two

thousand students, mostly at the eighth grade level, participated in the Phase I field testing effort.

Subject specialists from the Advancement School observed classes and conferred with field testing teachers for one month. Teacher's questions were recorded, and attempts were made to answer these questions.

The materials were then introduced into the classrooms, and subject specialists observed and helped teachers as they used the materials. The materials consisted of five subject-matter units: Communications, Geology, Probability and Problem Solving, Remedial Reading and Physical Education.

School principals and local school supervisors were asked for their observations and, at the conclusion of the Phase I field testing, evaluation conferences were held for the Advancement School staff and the teachers. Information from these conferences and from questionnaires indicated that the materials could be used successfully and that the students and teachers benefited from the program.

As a result of the fall effort, materials were revised and preparation for the Phase II evaluation was begun.

The five units tested in the fall were then involved in Phase II evaluation. In addition, three new units, Experiential Grammar, Urban Studies and Games were involved in the Phase I evaluation.

## II. PURPOSE

The present study conducted in the winter 1967 represents the procedure, results and discussion of Phase II of the field testing program. The purpose of the Phase II field testing was to determine the extent to which using the units affects the learning, attitudes and achievement of students, and the teaching behavior of instructors; and to compare the units with materials presently used in the public-school system.

## III. METHOD

### A. Description of Units

#### 1. Communications

This ten-week unit is designed to make students more aware of their potential to communicate and to help them to realize this potential. The course consists of 20 related lessons which utilize both the popular and fine arts to explore topics which interest the students. Though each form of communication is studied, the emphasis is on resolving problems the students must deal with if they are to continue their social and intellectual growth--problems such as teen-age gangs, relationships with peers, relationships with parents and other adults, loyalty and hatred.

Also, through experiences in communication, students gain a respect for the creative individual, the creative process, and their own creative ability.

2. [illegible]

The Geology unit is based on the belief that a student learns best from activities that involve him physically, and in experiences that are visual. It is designed to give the student opportunities to make observations and draw conclusions from experiments or simulated experiments he performs alone or in small groups.

Fifty interrelated lessons, complete with transparencies models, and other devices treat five main subject areas: (1) the identification of rocks and minerals, including a study of their composition, (2) forces that sculpture the earth's surface, (3) forces that modify the earth's features, (4) earth history, and (5) topographical mapping.

3. Probability and Problem Solving

The Probability unit uses the natural appeal which probability and games of chance have for students to involve them in performing such experiments as flipping coins, rolling cubes, and twirling spinners. The students

record these experimental results and then make decisions based on them.

The vehicle of probability is used to create high interest and involvement among the students. Once they have become active participants in the work, its content guides them through such topics as decimals, percentage, ratio and proportion, exponents, area, perimeter, inequalities and operations on fractions.

The three and one-half week Problem Solving unit introduces a technique of diagramming which applies to many types of word problems. By using this approach, students are able to envision the relationships found in word problems. As a pictorial form of symbolic language, it furnishes a concrete transition between pre-algebra concepts and the more difficult and abstract concepts of algebra. The unit also serves as a brief review of inverse operations, reciprocals, fractions and percentage.

4. Remedial Reading

The Remedial Reading unit, which takes an approach characterized by a pattern of diagnosis, homegeneous grouping, instruction on the basis of diagnosed needs, assessment, and regrouping, consists of a handbook

outlining this approach and 15 lessons exemplifying it. These lessons consisted of audio-tapes, transparencies and other materials covering many aspects of reading instruction.

The main purpose of field testing the unit is to determine whether teachers untrained in the specialized methods of remedial reading can, with the aid of a handbook prepared specifically for this kind of teacher, give such instruction to large classes.

The time required to teach the unit varies with the seriousness of the students' impairment.

5. Physical Education

This unit is a review of the basic sports positions and the fundamental movements of running, throwing, catching, jumping, kicking, climbing, walking, standing and carrying. It was developed because most incoming Advancement School students, although physically fit, had not mastered these fundamental physical skills.

The ten-part unit includes 350 slides which demonstrate the body positions, accompanied by 10 tape-recordings of commentary. Further drills and demonstrations are suggested for the teacher.

B. Objectives of Units

1. Communications

Some of the behavioral objectives of the Communications unit are: the improvement of creative abilities of students--i.e., to help students offer more and better solutions to problems; the improvement of attitudes and degree of sensitivity of students toward others in the form of respect and tolerance for different people, their environment and ideas; and an appreciation of all forms of communication. It is also hoped that the students will become motivated to try harder as indicated by improved attitudes and an increase in the quantity and quality of their writing.

2. Geology

A major objective of the Geology unit is to present a well organized body of valid geological concepts. Processes and principles are emphasized rather than factual material. Thus there is minimal emphasis on terminology. In addition, the teaching procedures are designed to help students understand the role of scientific methodology and to improve their attitudes toward science and science courses.

3. Probability and Problem Solving

The Probability unit's two objectives are: (1) to improve the student's attitude toward mathematics by improving his ability to grasp the relationship between mathematics and the physical world, and (2) to improve pre-algebra math skills through the vehicle of probability.

Problem-Solving introduces the technique of illustrative diagramming. Through use of this technique a brief review of certain pre-algebra topics can be accomplished. It is also hoped that the students will experience success with solving mathematical problems and that a positive change in attitude toward mathematics will result.

4. Remedial Reading

The major concern in the development of the Remedial Reading unit is to provide a simple and comprehensive method by which public schools can establish a center for teaching reading with teachers who are not specially trained in reading. This unit will help teachers analyze and correct students' reading problems.

5. Physical Education

It is hoped that students will master fundamental physical skills and better understand the principles involved in motor skills after having the Physical Education unit.

C. Evaluation and Testing Instruments

For the assessment of the field testing units, antecedent, transaction, and outcome data have been collected--i.e., the conditions of the field testing situation prior to experimentation, during experimentation, and at the conclusion of experimentation.

Since transaction data is perhaps most important in defining the experimental treatment, all classes using the field testing material were involved in this aspect of the evaluation. These data are in the form observation sheets filled out by each participating teacher, and reports by observing supervisors, school administrators and subject specialists.

The pre-post testing of control and experimental groups provided the antecedent and outcome data so that a comparison could be made between units developed at the School and those already in the public school system.

1. Transaction Data

All information obtained during the course of the evaluation was considered transaction data.

Communications--The field testing of the Communications unit was carried out in 30 classes. All teachers were required to fill out daily and weekly observation sheets.

These teachers were observed and helped during the course of the unit by subject specialists from the Advancement School.

The Semantic Differential (1, Appendix B) was administered to several classes to test for changes in attitudes toward communication in the form of art, music and ballet. The students saw two slides (one a picture of a painting and the other a picture of ballet dancers) and listened to a musical selection (Polonaise). The Differential was given to six classes near the beginning of the unit, at the end of the unit, then again at the end of the school year.

Geology--All students from the 23 classes using the Geology unit were given four comprehensive (approximately 30 item) tests developed by the Advancement School's Science and Research Departments. One of these was given after each ten lessons. Three different types of questions were used in each test: retention items, designed to measure the degree to which students mastered and retained the factual information learned in the course; association items, designed to measure the degree to which students understood the basic concept in each lesson as well as the

interrelationship among the various ideas involved in the concept; projection items designed to measure the degree to which students were able to apply knowledge and concepts in new situations. Copies of the tests are included in the Geology field testing report. Sample questions are presented in Appendix E. Copies of the daily observation sheets completed by each teacher are included in the Geology field testing report. These observation sheets described the concept being taught in the lesson, the teacher's judgement as to the percentage of the class showing interest in the lesson, rating of the structure of the lesson, rating of the depth of treatment of the topic, and a rating of the appropriateness of the media used to present the lesson.

Probability-Problem-Solving, Remedial Reading, Physical Education--Evaluations by subject specialists from the Advancement School and daily observation sheets from the teachers provided transaction data for the Probability-Problem-Solving, Remedial Reading, and Physical Education units.

In addition to field testing the Probability and Problem-Solving unit, all teachers involved in experimental testing were enrolled in teacher-training. A trained observer, using

the Flander's Categories for Interaction Analysis, (2, Appendix B) worked with teachers to help them realize their goals and the goals of the unit, and to show them how they could effectively alter their teaching style to reach these goals.

2. Antecedent and Outcome Data

All pre-post testing of experimental and control groups was considered antecedent and outcome data.

Communications--Three pre-post measures were employed in the experimental-control testing of the Communications unit. The Barron-Welsh Art Scale (3, Appendix B) was administered to test for creative ability. This test consists of the Revised Art Scale (RA) and the Barron-Welsh Art Scale (BW) abstracted from the Welsh Figure Preference Test.

The Torrance Creativity Tests (4, Appendix B) were given to all experimental and control groups.

Pre and post writing samples were obtained from both experimental and control groups. To obtain the writing samples a picture was projected on a screen and each member of each class was asked to write about it. Pictures differing in specific content but similar in general outline

and complexity were used for the pre- and post-tests. The quantity of writing was determined by a simple word count. The quality of these samples was scored by independent judges (trained at the Advancement School) according to five sets of criteria. These criteria as used by the judges were: effective use of details; interpretation of stimulus; reference to works of art; reference to feeling; and technical facility. These criteria are described in greater detail in Appendix A. The judges compared the pre and post papers of each student. Without knowing which were the pre or the post papers the judges were required to determine which paper was better solely according to the criteria. Three judges scored each pre-post pair. In case of a 2-1 split, the conflicting judgment was discarded. (Detailed instructions used in scoring the writing samples are presented in Appendix C).

Geology--The experimental and control groups for Geology were given Interest and Ideas (5, Appendix B) in order to measure their attitudes toward science, and Test on Understanding Science, (6, Appendix B) a 36-item multiple-choice test which measures the students' understanding of the role of scientific methodology. These instruments were

developed originally for the Elementary School Science Project and the School Science Curriculum Project at the University of Illinois.

Probability and Problem-Solving--The Interest and Ideas test was revised so that attitudes toward math for the experimental and control groups could be determined.

The Stanford Achievement (7, Appendix B) subtests--Arithmetic Computation and Arithmetic Applications--were administered to provide a comparison in performance on standard achievement tests between students using the Probability and Problem-Solving unit and students using the present state-adopted material.

A fact test (Appendix D) developed by the Math Department at the Advancement School tested the experimental students' comprehension and pre-algebra math skills. This test was not given to the control classes.

Remedial Reading--The experimental and control groups for Remedial Reading were given two pre-post testing measures: Huelsman's Word Discrimination Test (9, Appendix B) and the California Phonics Survey (10, Appendix B) both of which the teacher used to help discover and correct specific reading problems.

Physical Education--In order to test the motor-skill-building objective of the Physical Education unit, the experimental and control groups were given the Peacock Motor Skills Test (8, Appendix B) pre and post. To determine whether the students gained an increased understanding of the principles involved in motor skills, a pre-post fact test developed by the Physical Education Department of the Advancement School was administered.

D. Field Testing Schools and Classes

This section contains a description of the schools and the groups used in experimental-control testing to obtain antecedent and outcome data.

1. Communications

The groups for the experimental-control testing in Communications were selected by matching students in the experimental and control classes.

Two senior high school classes and three junior high school classes comprised the experimental group. Comparable control groups were obtained by matching students according to age, sex, race, socio-economic class and I.Q. on either the Otis or the California Mental Maturity Test.

Each participating teacher taught both an experimental and a control class. This was the first time any of the teachers had used the unit.

The high school (01*, grades 10 - 12) was a fairly new integrated rural school, not overcrowded and with good facilities. The socio-economic background of the students was moderate to good.

Two classes in this school were used as experimental groups although they were combined for analysis purposes. One of the high school classes was tenth grade, the other was eleventh. The students were of average intelligence but low achievement. Both classes were composed of repeaters. Their teachers had had approximately five years teaching experience and were in their subject field.

A third school, 01* testing the unit had only seventh graders. It was an old school with poor facilities located in a mill town. Although the education of the average parent of these students was low, their socio-economic status was moderate. The school had undergone token integration. The students tested were of average-above-average ability and achievement. Their teacher was experienced although out of her subject field.

*Code numbers instead of names have been used to identify the schools.

The remaining two experimental classes were composed of eighth grade students. One class was in a new integrated city school, (04)*, (grades 7 - 9) but the class used in the experiment was not integrated. The school was over-crowded but had good facilities. The students came from moderate - to high-income homes. The students were of average ability and achievement. The teacher had had many years of experience and was in her subject field.

The other experimental class, (02)*, was located in a fairly new, totally integrated junior high school (grades 7 - 9). The school was overcrowded with limited facilities. The students were heterogeneously grouped. Their socio-economic status was moderate to good. This was the teacher's first year of teaching.

2. Geology

From the group of teachers who had taught the Geology unit during Phase I, six teachers were selected randomly, each of whom taught an experimental and a control group. The experimental-control students, all eighth graders, were matched according to age, sex, race, socio-economic and educational status of the parents, I.Q., and, in some cases, achievement scores in science. Since no I.Q. scores were

available for one school, stanine scores on the SCAT test were used instead.

The following is a description of the school and groups participating in the experimental-control testing.

1. A relatively new, overcrowded, suburban junior high school, (08)*, with approximately 1,800 students. The science classrooms were well equipped. The school had a predominately white student body. All the students were considered average in ability and achievement. They came from homes of moderate to good socio-economic status. The teacher was experienced and had a good background in science.

2. A seventh - ninth grade city school, (07)*, with a predominately white student body. The school was fairly new, well equipped in all areas, and had several other experimental programs in operation in subject areas other than science. The students came from relatively high level socio-economic homes. They were average to above average in ability and achievement. Although the teacher had his training in the physical sciences, he had had several years experience teaching Geology.

3. A relatively crowded, old, urban junior high school, (09)*, with limited facilities. The students had moderate to good socio-economic backgrounds and were average in ability and achievement. The teacher majored in home economics but was fairly experienced in teaching Geology.

4. A new rural consolidated junior high school, (05)*. The school was fairly well equipped; however, it had limited facilities for teaching Geology. Most of the students were white and of poor to moderate socio-economic backgrounds. The students using the unit were of average ability and achievement. The teacher was experienced and was teaching both math and science.

5. A rather new city junior high school, (06)*, composed entirely of Negroes from a deprived area. The school was not crowded and had good facilities. The students came from low-income homes, were considered below-average to average in ability and achievement, and had problems in reading. The teacher had had formal training in biology and several years experience teaching earth science.

6. The final sample was taken from an old, remodeled school, (10)*, with limited facilities. The predominately white student body came from homes with low to moderate incomes. The students tested were low to average in ability

and achievement. The teacher was experienced and in his subject field.

3. Probability and Problem-Solving

Five junior high schools in the Winston-Salem area were chosen for the experimental-control field testing of the Probability and Problem-Solving unit.

Comparable ninth grade general math groups, with different teachers teaching the experimental and the control classes, were obtained by matching students on sex, race, arithmetic achievement scores, socio-economic status and I.Q. The experimental teachers had never taught the unit before.

The following is a description of the experimental and control groups.

1. A rather new city junior high school, (13)*, composed entirely of Negroes from a deprived area. The school was not crowded and had good facilities. The students were from low-income homes, were considered below-average to average in ability and achievement, and had problems in reading. The teacher had had formal training in mathematics and several years experience teaching general math.

2. A fairly new, integrated, rural school, (15)*, with adequate facilities. The experimental-control students came from homes of low to moderate socio-economic status with parent education not exceeding graduation from high school. They were of average ability. The teacher was experienced and was teaching in his subject field.

3. A fairly new junior high school, (11)*, with limited facilities adjoining an old elementary school. The experimental-control students were of low to moderate economic status and were low to average in ability. The teacher was experienced and was teaching in his subject field.

4. A new junior high school, (12)*, with good facilities. The students in the test classes were low in ability and had moderate socio-economic backgrounds. The teacher was experienced in his subject field.

5. A fairly new rural school, (14)* with limited facilities. The school was predominately white, and the students came from families of moderate income and limited educational background. The experimental students were average in ability. The teacher was in his subject field but had had most of his experience teaching algebra rather than general mathematics.

4. Remedial Reading

The reading program was set up and operated in five schools. In most of these schools the teachers selected as instructors in the reading program had little or no training as specialists in remedial reading and had little or no experience in teaching reading.

In three of the schools pre-post data were obtained on a diagnostic test: the California Phonics Survey. In one of these schools a control group was set up as a basis of comparison with the experimental group. In this school additional data was obtained on both experimental and control groups using Huelsman's Word Discrimination Test as well as the California Phonics Survey.

The following general description is applicable to all five of the schools participating in this field testing project. The schools were selected randomly in order to include samples from the three major areas of the state (the coast, the piedmont and the mountains.)

The schools had average facilities, and the number of students in a reading class varied from approximately 12 to 37. Although not all the schools were new, they were in good condition.

Although the groups were primarily heterogeneous, they consisted mostly of students of low to average intelligence and achievement, with a few non-readers. Their socio-economic backgrounds varied from low to moderate.

The schools in the sample included students from self-contained classrooms, students in Language Arts-Social Studies blocks and students in departmentalized classes.

Four of the experimental teachers had had no experience teaching reading. All of the teachers had taught in the language arts area.

5. Physical Education

Six schools were involved in the physical education experimental-control testing effort. Each teacher taught an experimental and a control group.

Comparable groups were obtained by matching the students on their pre-performance on the Peacock Motor Skills Test. All students were heterogeneously grouped in intelligence and academic achievement. Of the six teachers two have taught the unit before.

The following is a description of the experimental and control groups for the Physical Education unit.

1. An old small-town integrated school (grades 1 - 8) with poor physical-education equipment. The students came

from moderate socio-economic backgrounds--their fathers were primarily farmers or merchants. The teacher had taught the unit before to an eighth grade class but in this study was using it with a seventh grade class composed of from 20 to 25 boys and girls. The teacher was in his subject field and had been teaching for six years.

2. A new integrated suburban junior high school with excellent facilities. The experimental class consisted of 25 eighth grade boys from moderate to good socio-economic backgrounds. The teacher had had experience teaching all grade levels and was in his subject field. He had taught the unit before to a ninth grade class.

3. An old rural union school (grades 1 - 12) with poor facilities. The school had token integration, and most of the student body came from poor to moderate-income homes. Their parents were for the most part, farmers and fishermen. The unit was tested in a class of 30 seventh and eighth grade students. The teacher had two years teaching experience, was in his field and was using the Physical Education unit for the first time.

4. An old rural union school (grades 1 - 12) with limited facilities. The students in this school came from homes with

poor incomes. The teacher was teaching the unit for the first time to a group of 18 ninth grade boys. The teacher had 20 years of experience in the physical education field.

5. An old rural union school with inadequate facilities. The majority of parents of the all Negro student body were tenant farmers of poor economic status. The teacher, although out of his field, was above average. He was teaching the unit for the first time to 25 ninth grade boys.

6. The junior high school was housed in the old section of a rural union school with good facilities. The unit was being taught to a class of eighth grade boys and a class of eighth grade girls from poor to moderate socio-economic backgrounds. The teacher was a social studies major with two years of teaching experience and was teaching the unit for the first time.

E. Assignment of Experimental - Control Classes

All teachers involved in experimental - control testing, except for those working on Probability and Problem-Solving, taught both experimental and control classes. In other words, the same teacher taught both an experimental and a control class.

In the case of the Probability and Problem-Solving unit, different teachers taught the experimental and control classes. Although, theoretically there is much to be said for using a teacher as his own control, it is likely that a teacher using either material or techniques successfully in his experimental class will also use them with the control sample.

The end product of this procedure is that the teaching in the experimental and control samples is much more identical, resulting in the reduction of the possibility of differences in student performance at the end.

## PHASE II FIELD TESTING

| Units | Groups | | Objectives | Testing Instruments | |
|---|---|---|---|---|---|
| | *E&C | T | | Antecedent-Outcome | Transaction |
| Communications | 5 | 30 | Improve creative ability of student | Barron-Welsh Art Scale<br>Torrance Creativity Tests | |
| | | | Change student attitudes toward different forms of communication | | Semantic Differential |
| | | | Develop student respect and tolerance for others | Writing Sample | |
| | | | Improve quality and quantity of student writing | Writing Sample | |
| | | | Teacher training | | Teacher observation sheets and conferences |
| Geology | 6 | 26 | Teach students processes and principles of Geology | | Comprehensive science test |
| | | | Increase student understanding of scientific methodology | Test on Understanding Science | |
| | | | Improve student attitude toward science | Interest and Ideas | |
| | | | Teacher training | | Teacher observation sheets and conferences |

* E&C - Number of experimental-control class pairs.
T - Total number of classes field tested

| Units | *E&C | T | Objectives | Testing Instruments: Antecedent-Outcome | Testing Instruments: Transaction |
|---|---|---|---|---|---|
| Probability and Problem Solving | 5 | 12 | Improve student attitude toward mathematics<br><br>Improve pre-algebra math skills<br><br>Teacher training | Revised Interest and Ideas<br><br>Stanford Achievement Test<br>Arithmetic Application<br>Arithmetic Computation | <br><br>Math fact test<br><br>Flander's Categories for Interaction Analysis<br>Teacher observation sheets |
| Remedial Reading | 4 | 13 | Train teachers to analyze and correct reading problems<br><br>Improve reading ability of students | Huelsman's Word Discrimination Test<br><br>California Phonics Survey | Teacher observation sheets and conferences |
| Physical Education | 6 | 12 | Teach mastery of fundamental physical skills<br><br>Increase student understanding of principles involved in motor skills<br><br>Teacher training | Peacock Motor Skills Test<br><br>Physical Education fact test | <br><br><br><br>Teacher observation sheets and conferences |

F. Phase I Evaluation

1. Description of Units

Three new units are presently undergoing Phase I Evaluation--Urban Studies, Games and Experiential Grammar.

a. Urban Studies

The Urban Studies unit is designed to introduce the student to various facets of American city living.

The course summarizes the factors which have historically influenced the development of cities and gives careful consideration to the elements which have determined their growth. The contemporary urban environment is studied by analyzing various problems such as pollution, transportation, and slum housing. The role of the individual in response to these crises is another consideration of the unit.

b. Games

Academic games or simulations were developed at Johns Hopkins University to be used at the junior and senior high school level. These games are designed to simulate and teach about the society in which students find themselves and the decisions they will have to make in that society--i.e., decisions about jobs, colleges, buying, borrowing, and the legislative process.

Simulations have been refined at the Advancement School and while they are not a complete curriculum unit, individual games are being disseminated in the field. These games are adaptable to different curricula and each teacher will receive a written guide and suggestions from a subject specialist as to the best way to incorporate games into the classroom.

c. Experiential Grammar

The Experiential Grammar course is organized so that students look at language first in a broad, general way, then begin to analyze its parts and their functions.

The first part of the course includes such things as a brief descriptive history of how language has changed, levels of language usage, the relation of the body (gestures, postures, etc.) to language, and slanted use of language (as in advertising).

This leads into a study of the parts of speech, clauses and phrases, and finally, as a way of review, a system of diagramming.

2. Assessment of Units

a. Urban Studies

The Urban Studies unit is being field tested in six classrooms. The evaluation includes observation of teachers in the field by members of the Social Studies Department and pre and post administration of a version of the Semantic Differential designed specifically for the course by Don Boshart of the University of Illinois. The purpose of the pre and post testing is to determine student attitudinal changes toward key concepts of the unit.

b. Games

The games and number of field testing classrooms are as follows: (1) Life-Career (4 - 5 classrooms), (2) Consumer (10 - 12 classrooms), (3) Legislature (1 -2 classrooms), (4) Family (1 - 2 classrooms), (5) High School (1 - 2 classrooms).

Reports from teachers and observation by a subject specialist will provide information for the evaluation of simulations.

c. Experiential Grammar

The Experiential Grammar unit was tested in nine schools in grades seven, eight, nine and eleven. The groups include

underachievers, slow learners, academically talented, and average students.

Teachers were asked to fill out daily evaluation sheets and summary evaluation sheets at the end of lessons six, eleven, twelve, and twenty-six. Reports by subject specialists, principals and local supervisors completed the evaluation of this unit.

# PHASE I FIELD TESTING

| Units | Groups Total | Objectives | Assessment |
|---|---|---|---|
| Urban Studies | 6 | Student attitudinal changes toward key concepts of unit<br><br>Teacher Training | Semantic Differential<br><br>Teacher observation sheets and conferences |
| Games | 17-23 | Teacher Training | Teacher observation sheets and conferences |
| Experiential Grammar | 9 | Teacher Training | Teacher observation sheets and conferences |

# IV. RESULTS

## A. Introduction

Before presenting the findings obtained from the rather large and assorted array of tests making up this program, a few comments are in order regarding the approach used in interpreting the data.

The normal expectation in this program was that the experimental groups would show improved performance on tests of knowledge or on measures of attitude after having participated in the field testing classes. The extent of such improvement would show up as increases in post test scores over pre test scores. It was also expected that the control groups which did not receive instruction in the field testing unit would show no improvement or would show less improvement than those in the experimental classes.

These ideal expected results may not always be obtained for a variety of reasons. Failure to obtain such results does not necessarily mean that the field testing units have been proved ineffective, but it does indicate a need to seek explanations for the results obtained.

Some of the reasons all of the results being presented in this report may not conform to the expectations held at the outset

are the following:

- The standard procedure in using control groups is to select a required number of individuals at random from the same pool so as to form two equal groups one to be assigned to the experimental treatment the other to a control treatment which is presumed to be the conventional instructional program currently being used in the particular school. Because students in the field test schools in this study were already assigned to classes and could not be rescheduled, the alternate procedure of selecting matched pairs of students in experimental and control classes was used. This matching procedure as well as other events such as absence of students on test days may have led to inequalities in the experimental and control groups which may account for some departures from the expected results.
- However, a more basic consideration has to do with the intrinsic characteristics of the experimental-control group procedure. First of all, in the experimental group a certain treatment is specified, for example the entire 11-week instructional program of the communications

unit or the geology unit. We act as if this treatment were the same in each of the experimental classes and then speak as if the experimental treatment were a unitary factor for which we anticipate a unitary outcome. Actually the experimental treatment varied widely from class to class. We can be sure this is true even if we have not described each class in detail and noted day-to-day differences. Therefore it is reasonable to assume that not one unitary treatment but a large number of different factors were operative in the experimental groups. Therefore experimental group test results may well show wide differences from one school to another.

- In the control group, although the treament is <u>designed</u> to be different from that of the experimental group, there are also many diverse factors that may operate to make various control groups differ greatly from school to school. Moreover, it is often erroneously assumed that control groups provide a sort of standard or bench mark. However, we cannot assume, for example, that the applied treatment effects will be uniformly alike in all control groups nor can we anticipate that treatment effects will always produce little or no effect on test results.

- The tests used to measure the changes in student performance may have varied in sensitivity and in relevance of content. Some of the tests were still being developed so that their characteristics as measuring instruments were not fully known. This was especially true of the Test on Understanding Science and the Interests and Ideas test. Some of the standardized tests, such as the Stanford Achievement Tests have been designed to cover a broad range of topics and as a result they may be less sensitive to the narrower range of specific topics covered during the relatively short field test period of 8 to 12 weeks. In general it is likely that the subject matter of standardized tests, prepared for generalized testing situations, will be less relevant to the topics covered in a given field testing unit than will the subject matter of tests constructed specifically for those units. Thus the Math Facts test will probably be more relevant than the Stanford Achievement Tests and the Comprehensive Science tests for geology will be more relevant than the Test on Understanding Science. These characteristics of the testing instruments could produce quite a few of the variations in results observed in

this study. Such variations would, of course, require consideration in interpretation of the results.

- The conditions affecting the test-taking behavior of students could lead to variations in test results. For example, test results may be higher or lower if special conditions existed that led some students to try harder than others. Such differences in motivation may stem from the fact that students may be affected differently by the instructions (or by people giving the instructions) in the test sessions, or from the fact that the test administration procedures (or the people administering the tests) may be different from one class to another. However, test scores may be influenced not only by conditions existing in the test sessions but also by factors that may operate during the days or weeks preceding the test session. Thus in experimental classes using the communication unit the taking of the Writing Test may be a natural culmination of the series of teaching events leading up to it, whereas in a control class the Writing Test may be an abrupt or unexpected demand which does not seem reasonable or meaningfully connected to what has gone before.

- Sometimes a given result occurs by chance. To the degree that the various factors affecting the outcome of the tests can be controlled, the likelihood of these chance occurrences is reduced. This is, in fact one of the main purposes of using the experimental-control group procedure with pretests and posttests in this study. In comparing results of experimental and control groups or of pre and post scores the data have been analyzed in terms of tests of significance. The customary 5% confidence limit was applied. Hence, in a study like this, involving many comparisons, one would expect that one out of every 20 comparisons would show a significant difference purely by chance. This, again, may explain some of the diverse results that were not in line with the ideal expected outcomes.

From what has been said so far it follows that interpretation of these field study results will require explanations and/or consideration of outcomes that were not anticipated when the plans for the experiment were first laid out. As a consequence it may be necessary to be content with somewhat more tentative interpretations and to be prepared to deal with findings that were not

bargained for at the outset. This, of course, is not altogether undesirable since it does provide a situation in which many new hitherto unexpected factors can be explored. Viewed in this light the field testing in this project is as much a matter of exploring new approaches and seeking new insights into teaching as it is a matter of running tests to determine whether or not ideas, held in the beginning, could be substantiated. Thus, in making the analysis of the field tests in this study, attempts were made both to validate pre-existing concepts and to seek for new previously unknown factors that may be influencing the teaching and learning activities.

IV. RESULTS

B. Communication

1. Transactional Data

Transactional data for the communication course consisted of teacher observations and the results of the Semantic Differential Test.

Since the teachers using the communications unit chose the number of lessons they used and had a good deal of freedom in organizing the lessons themselves from a number of suggested activities, the number of the daily ratings submitted by the various teachers varied considerably.

The teachers completed the following ratings on each lesson: (A number in the chart represents the total number of teacher judgments for that category for all the lessons.)

| 1. Student response: | 15% | 30% | 50% | 70% | 85% | 100% |
|---|---|---|---|---|---|---|
| a. participation in discussion | 1 | 2 | 15 | 36 | 100 | 61 |
| b. understanding of content | 1 | 0 | 2 | 12 | 73 | 132 |
| c. enthusiasm for activities | 2 | 0 | 3 | 31 | 71 | 165 |
| d. enthusiasm for writing assignments | 0 | 0 | 7 | 23 | 67 | 44 |
| e. stimulation of interest in reading | 5 | 1 | 6 | 16 | 47 | 30 |

2. Teacher response:

a. Were activities appropriate to purpose of lesson?
Yes 209 No 4

b. Were materials appropriate for your students?
Yes 203 No 5

In summary, most teacher-ratings judged student participation in discussion, interest in reading, and enthusiasm for writing assignments to be about 85 per cent. Their understanding of content and their enthusiasm for the activities of the lessons was most often judged to be 100 per cent. The teacher-ratings were almost unanimous in judging that the activities were appropriate to the purposes of the lessons and to their students.

Teachers responses to the materials were extremely positive. In daily classroom observations that set student involvement and understanding of the materials consistently high.

These ratings may be compared with the ratings by the same teachers made for the control group which each one taught. Usually the control group was taught English or some other standard school curriculum material. They were not exposed to the communications unit.

The teachers completed the following ratings on each control group lesson: (A number in the chart represents the total number of teacher-judgments for that category for all the lessons.)

| 1. Student response: | 15% | 30% | 50% | 70% | 85% | 100% | 0% |
|---|---|---|---|---|---|---|---|
| a. participation in discussion | 0 | 1 | 2 | 13 | 6 | 5 | |
| b. understanding of content | 0 | 0 | 0 | 13 | 5 | 16 | |
| c. enthusiasm for activities | 0 | 0 | 0 | 14 | 7 | 13 | |
| d. enthusiasm for writing assignments | 0 | 0 | 0 | 13 | 8 | 4 | 1 |
| e. stimulation of interest in reading | 0 | 0 | 1 | 16 | 5 | 4 | 1 |

Most teacher ratings judged student participation in discussion, understanding of content, enthusiasm for activities, enthusiasm for writing assignments, and stimulation of interest in reading to be 70 per cent.

Thus, most of the teacher ratings for all of the items in the chart were higher for the group using the communications unit (85 to 100 per cent) than for the group using other materials (70 per cent).

The Semantic Differential, it will be recalled was used to measure attitude toward three art forms: painting, music and ballet. During the test a print of a painting was shown for the first form, a selection of music was played for the second and a picture of ballet dancers for the third. The test was administered three times, at the beginning of the unit, at the end of the unit and at the end of the school term. Twenty adjective scales were given on the test form, fourteen of which were scored on the evaluation factor, using the standard scoring techniques, fixing the maximum possible score at 98 and the neutral score at 56. Smaller scores represented more favorable attitudes.

The data obtained from five classes in four of the test schools are shown in Figure I.

The overall interpretation suggested by the curves in Figure I is that attitudes toward ballet and painting became less favorable during the term whereas attitudes toward music became more favorable. Scores from session 1 to session 3 showed an increase of 1.51 for ballet, 3.13 for painting and a decrease of 3.28 for music.

The mean scores on the Semantic Differential can be compared for different tests. On this basis the students' feelings toward ballet was less favorable than toward painting and music. There is also an indication that feelings about music tended to become quite a bit more favorable than feelings toward painting.

These differences in attitude toward the various art forms, as well as the changes in attitude are difficult to explain. The music used as stimulus when the Semantic Differential was administered was Polonaise by Chopin, whereas the music used during the communication course was popular and modernjazz. One of the lessons in the course was on the dance. Paintings were used as background decorations in the classroom, but there were no lessons directly focused on painting. None of these factors seem to bear a definable relationship to the responses on the Semantic Differential.

Use of the Semantic Differential shows promise as a means of detecting changes in attitude as a result of exposure to certain kinds of courses. To realize this benefit it will be neccessary to use more sophisticated experimental designs so that results of groups given different kinds of instruction can be compared.

# IV. RESULTS

## B. Communication

### 2. Antecedent and Outcome Data

Three different pre-post tests were given in five classes (4 schools) to both experimental and control groups: The Writing Sample Test, the Barron-Welsh Art Scale and the Torrance Creativity Tests.

It will be recalled that each student's pre and post Writing Samples were evaluated by three judges. Without knowledge of which was the pre or post sample the judges selected the paper they deemed better. These judgments were made independently on each of six criteria:

- Use of details. The extent to which the student used details forcefully, and artistically rather than mundanely or drably in describing a picture or making up a story.
- Ability to Project from Stimulus. The extent to which the student infers ideas from the information given in the picture being shown, particularly descriptions of personal history, relationships, self-concept and motivation.

- Writing Technique. The extent to which the student displayed logical organization, variety in structure of language used and precision in diction. Mechanical features such as spelling, and punctuation were not taken into consideration.
- Emotional Involvement. The extent to which there is a close identification between the student's own expressed feelings and the feelings of the individuals being described.
- Feeling Words. A count of the number of times the student uses words that show how a character feels. Excluded are words that describe the cause or the result of emotion and that describe physical sensation.
- Quantity. A count of the total number of words written.

Detailed instructions followed in judging the papers are contained in Appendix C.

The summary of these judgments is presented in Table 1. It is immediately apparent that, in the experimental groups, the post test samples are judged better more often than are the pre-test samples. On the other hand, the reverse is true for the control group.

Tests have been applied to these results to determine whether the proportions of "post better" judgments are <u>significantly</u> greater for the experimental group than for the control group; also whether the proportions of "pre better" judgments are significantly greater than the "post better" judgments in the control group; and whether the proportions of "post better" judgments are significantly greater than the "pre better" judgments in the experimental group. Table 2 contains a summary of the results of these tests. (The table shows z values computed by the formula $z = \frac{P_1 - P_2}{\frac{P_1Q_1}{N_1} + \frac{P_2Q_2}{N_2}}$ for comparison between "post better" ratings; and z values computed by the formula $z = \frac{N(1P_2 - .51-\frac{n}{2})^2}{.25 + N}$ for comparison between the "pre better" and "post better" ratings in the experimental groups and also in the control groups).

Results of these analyses confirm that a significantly greater proportion of "post test" writing samples were judged better on five of the six criteria in the experimental group than in the control group. They also show that in the experimental group, on the same five criteria, the proportion of post test papers judged better was significantly larger

than the proportion of "better" judgments on the pre tests papers. On the other hand, for the control group the reverse was true--the proportion of pre test papers judged better was significantly larger.

The results of this study thus seemed to show that the communication course produces significant improvements in the writing of students. However, since the control group's post test performance showed a significant decrease, the performance of the experimental group appeared comparatively better than it would have been if the control group's performance had not changed.

There is evidence that this decrease in performance of the control group was not due to random error. However, it is not likely that this effect can be attributed to a genuine decline in the ability of the control group to write prose. Because of this it could be argued that the comparison should be based on a hypothetical control group with no change in performance from pre test to post test. If this assumption were made the proportion of "post test better" judgments in this control group would be .50. Tests were made to determine if a significantly larger portion of the test papers in the experimental group would still be judged better when compared

to such a hypothetical control group. Results of this calculation showed that more than half of all the experimental groups post test papers were judged better on all criteria; and on some of the criteria, namely, Projection from Stimuli, Writing Technique and Quantity, the portion of papers judged better was significantly larger in the experimental group.

During the field testing project, field representatives reported that the communication course was being taught more effectively in some of the participating schools than in others. The teaching was judged to be least effective in schools 01 and 02, especially in 02. Because of this it was deemed worthwhile analyzing the writing sample test results for each of the schools. Tables 3,4,5 and 6 show, respectively, for schools, 01, 02, 03, and 04, the number of times the pre test papers and the post test papers were judged better in both the experimental and the control groups. Table 7 shows the z values obtained when tests were applied to show whether or not the "post test better" judgments of the experimental and control groups differed significantly. In all of the schools and on all of the criteria the proportion of "post test better" judgments was larger in the experimental than in the control group. In schools 03 and 04 this proportion

was significantly larger in the experimental group on all criteria except Feeling Words. However, in school 02 where the instruction was considered least effective the proportion of "post test better" judgments was significantly greater in the experimental group on only one of the criteria, namely Projection from Stimulus, and in school 01 this proportion was significantly greater on three of the criteria,-- Projection from Stimulus, Use of Details and Writing Technique.

These results add support for the view that the Communication Course does have a positive influence on the writing performance of students. Even if the improvement of the experimental group is considered to be relative to a hypothetical control group with no pre-post decrease, the improvement is significant. Of course, it can be argued that whatever factor operates in the control group to produce a pre-post decrease very likely operates also in the experimental group. Therefore, if this factor were absent the experimental pre-post increase would be quite a bit larger than the actual figures obtained in this study.

Additional evidence of the positive influence of the Communication Course rests in the finding that this influence is stronger when the course is well taught.

That is, the data in this study would have made the effects of the Communication Course appear even more positive if the instruction had been uniformly effective in all of the schools.

These results then, lead to the view that the Communications Course when correctly taught, will produce a marked increase in the writing performance of students. This improvement is reflected in students' ability to write longer selections with better quality. Students show greater command of language structure, more interesting use of details, greater ability to "read meaning" into situations and to empathize with individuals that may be involved. To teach the course correctly does not require conformity to a set of narrow procedures. On the contrary, within the broad framework of the overall purpose and general procedure, teachers have wide latitude in the selection of materials, the sequence of presentation and the approach used.

Does this Communication Course affect students in ways other than the quantity and quality of their writing as measured in the writing samples test? For example, do changes take place in students' performance on tests of creativity?

The Torrance Tests of Creative Ability given to both experimental and control groups in the four participating schools were administered at the beginning and again at the end of the communication course. These tests, it will be recalled, are designed to measure creative abilities of students other than the cognitive abilities found in general intelligence tests. The tests call for both verbal and figural types of activities. In each of these two types of activities several different aspects of creative behavior are involved. One aspect, known as fluency consists basically of the number of responses the individual is able to make within a given time to given sets of stimuli. Another aspect, flexibility, consists of the variety of responses the individual is able to make. Originality, emphasizes the number of unusual responses, that is, the number of responses different from those typically made by a group of people.

The aspect of elaboration, included only in the figural tasks, provides a measure of the extent to which the individual is able to work out relevant, non-redundant extensions of an idea.

Results of the Torrance test were analyzed for each of the four participating schools. The data are presented in a separate table for each component of the test (tables 8, 9, 10, 11, 12, 13 and 14) so as to facilitate comparison of results among the schools.

The information presented in the tables consists of the mean scores made by the experimental and control groups on the pre and post tests. The pre test results are shown in column 4 of the Tables and the post tests results in column 5. Column 6 contains the pre-post test differences. A negative difference indicates that the post test score was smaller than the pre test score. Mean scores for experimental and control groups, are given in successive rows on the tables. (Thus in Table 8, Verbal Fluency, the mean pre-test score for the experimental group in school 01 is 64.91, and the mean of the corresponding control group is 65.54. Since the latter mean is the larger, the difference in the following row is indicated arbitrarily as a negative difference.

The significance of the difference between means was calculated by means of t-ratios. Significant differences are indicated either by (a) or (b) following the "difference"

entries in the Tables. For example, in Table 8, school 03, there is a significant decrease of -9.03 from pre to post test for the control group, and on the post test the difference of 19.64 between the experimental and control groups is significant.

Because of the difficulty of arranging strictly comparable experimental and control groups in this type of field work it is often desirable to use statistical analyses that "correct" or "make allowances" for initial differences between the two groups. An analysis of variance (Type I, Lindquist)* was used to determine the significance of differences in the patterns of pre-post test changes between the experimental and control groups. Ideally the expected results in this type of of field study would consist of equal pre test means for both the experimental and control groups and of post test means showing a significant increase for the experimental group and showing no change for the control group. However, other patterns of change could also be meaningful for this type of study. For example, even if control group pre test means were significantly larger (or smaller) than means of the experimental group the results could still be significant if

the experimental post test mean showed a marked increase while the control mean remained unchanged. Conversely, the kinds of results anticipated in these field tests may not be realized if control means as well as experimental means were to show large but similar pre-post increases regardless of the amount or direction in pre test differences between the experimental and control group. The Type I analyses of variance provides an estimate of the interaction effect which is indicative of these various patterns of pre-post test changes. The results of these analyses are shown as f-ratios in column 7 on the tables. For example in Table 8, Verbal Fluency, for school 04, there is a significant f-ratio of 18.7, indicating, in this case, that there is a significant difference between the experimental group's pre-post increase of 22.69 and the control group's pre-post decrease of -3.00. Thus the control group starts at 78.46 and changes very little while the experimental group starts considerably lower but finishes considerably above the control group. Other f-ratios are also obtained as other components of the total variance of all the test scores. For example, in Table 8, Verbal Fluency, for school 02 there is a significant pre-post (within component) f-ratio of 27.3 indicating that the composite gains

of both the experimental and control groups are significant.

Of course, the t-tests, already noted by the designation (a) or (b), indicate that each group separately also shows a significant increase. It should also be noted that in this case the interaction, f-ration, is almost exactly zero indicating no difference in the pattern of pre-post test changes for the two groups combined. In this same Table 8, the f-ratio of 4.4 shown in the last column for school 03 indicates that the composite pre-post scores of the experimental group are significantly larger than the corresponding scores of the control group (between component). Again there is no significant interaction effect in these data for school 03. This lack of significance is indicated by the f-ratio of 2.1. Thus, although the standing of the experimental group compared to the control group becomes higher on the post test, the difference in the pattern of change is not large enough to be significant.

A preliminary and overall examination of the information obtained from the Torrance Tests of Creative Thinking and presented in Tables 8, 9, 10, 11, 12, 13, 14 does not point to any consistent or uniform relationship among the results of the various schools or among the composite results of all

four of the schools. Nor are there consistent patterns from one sub-test or component to another. However, certain observations may be made because they suggest some findings that may become meaningful upon further analysis or upon replication of the studies.

- The Verbal Fluency sub-test may be considered somewhat similar to the writing sample test in that both quantity and quality of verbal output were involved. On Verbal Fluency the trend for the composite of all the schools showed only a slight pre-post test increase for the experimental group and a significant decrease for the control group. Although this was not the expected ideal outcome, it did point to a relatively better outcome for the experimental group. In addition, the results appeared to be similar to those observed in the writing sample test where the experimental group was judged better on the post test more often than the control group and where the control group showed a pre-post test decrease. This pattern, however, is not consistent for all of the participating schools. The pattern does show up in the results for school 03 and

a somewhat parallel pattern can be observed for school 04 in which, however, the experimental group shows a significant improvement and the control group declines only slightly. However, in schools 01 and 02 the patterns are quite different. In the former school the control group shows a significant pre-post test increase while the experimental group changes very little, whereas in the latter school both experimental and control groups decrease significantly. It should be recalled that the teaching of the Communication Course was considered to be more effective in schools 03 and 04.

- In Table 9, Verbal Flexibility there are no significant differences between pre-post patterns in the experimental and control groups. (None of the f-ratios for interaction are large enough to be significant). In most of the groups the changes from pre test to post test were significant. In schools 01, 02 and 03 these changes were significant decreases; whereas in school 04 they were significant increases. School 04 comes closest to conforming to the ideal expected pattern.

- In Table 10, Verbal Originality, a significant interaction pattern for the composite of all the schools is evident. In this pattern the experimental group shows a pre-post decrease while the control group shows a pre-post increase. Schools 02 and 03 separately show this name pattern, and school 01 shows a somewhat parallel pattern in that , although both experimental and control groups decrease, the decrease in the experimental group is larger (Interaction not significant, however). School 04 shows another somewhat parallel type of pattern. That is, both experimental and control groups show pre-post test increases but the increase in the control group is larger (However, the interaction, F=2.9, is not significant). Thus all of these patterns, although somewhat different, are all opposite to the expected ideal outcome, namely a change in the experimental group significantly greater than in the control group.
- In all four components of the Figural tests there is no single readily discernable pattern. For all four schools combined for both experimental and control groups there are significant increases in pre-post

scores on Figural Fluency, Figural Flexibility, and Figural Originality and significant decreases in pre-post scores on Figural Elaboration. (See the last row in each of tables 11, 12, 13 and 14.) In most of these instances the interaction effect is significant. A significant interaction effect is present for school 03 on Figural Fluency and Figural Flexibility and this is in the ideally expected direction in which the experimental group's pre-post test gains exceed those of the control group. The only other significant interaction effect is for school 02 on Figural Elaboration. This change is the opposite of the expected ideal outcome in that both experimental and control groups show a pre-post decrease in scores but the experimental groups decrease is significantly greater.

Could these apparently inconsistent results on both Figural and Verbal components of the Torrance Tests of Creative Thinking be explained in terms of failure to maintain uniform and standard conditions while the tests were being administered. Or could they be explained as influences on test-taking behavior that stems from the general approach

taken by staff members in the participating schools to the field testing effort. There are no dependable final answers to these questions, however, some of the apparently inconsistent results for various components of the Torrance Tests were obtained in the same test administration sessions. Thus some of the inconsistent results cannot be explained in terms of differing test administration conditions.

There is, of course, a somewhat tenuous trend throughout some of the results of the Torrance Tests suggesting that in school 04, in which the Communication Course was taught quite effectively, the findings tended to support the expected ideal outcome more often. However, based on the results available at this stage there is as yet not enough evidence to show what kind of impact can regularly be expected on creative performance as measured by the Torrance Tests on students who participate in the Communication Course.

These inconclusive findings on change in creative performance were also found when the Barron Welsh Art Scale (BW) and the Revised Art Scale (RA) were used. The scores on these tests are shown in Table 15. When tests of significance were applied to these data no significant differences were found.

It is concluded that the Communication Course results in an increase in both quantity and quality of the writing of students who participate in the program. However, there is as yet not enough data to show whether or not the instruction received in the Communication Course changes creative performance as measured by standard tests of creative or artistic ability.

C. Geology

1. Transactional Data

Transactional data for the geology field testing program consisted of teacher observations and the Comprehensive Science Tests.

Teachers using the Geology Unit were asked to fill out observation sheets on each of the 52 lessons. They were asked to report on the following items for each lesson: (1) What was the percentage of the class showing interest? (2) Was the internal structure of the lesson good, fair or poor? (3) Was the external structure of the lesson good, fair or poor? (That is, does the lesson follow from the previous lesson and does it lead naturally into the lesson following it?) (4) Was the depth of treatment adequate, inadequate or overemphasized? (5) Were the provided means appropriate for teaching this lesson to your class?--yes, no, fair.

Twenty-one teachers reported on the lessons; however, in some cases, a teacher omitted a lesson. The last five lessons were often omitted due to time pressures.

From the teachers' reports of attentiveness for all the lessons, we find that the average teacher-rating of class attentiveness for the average lesson was 91 per cent.

Ninety-five and sixth-tenths per cent of the teachers ranked the internal structure of the typical lesson as good; 2.5 per cent ranked it as poor; and 1.9 per cent ranked it as fair. The rankings for the 52 lessons varied from a low of 84.2 per cent, ranking the internal structure as "good". The external structure of a typical lesson was ranked as good by 97.2 per cent of the teachers, as poor by 1.6 per cent, and as fair by 1.2 per cent. The rankings of "good" varied from 83.3 per cent to 100 per cent. The depth of treatment was seen as adequate by 92.3 per cent of the teachers; 4.8 per cent considered the treatment inadequate in depth; and 2.9 per cent felt that the depth of treatment was overemphasized. The rankings of "adequate" varied from 76.5 per cent to 100 per cent. When asked if the means were appropriate for teaching a typical less to their classes, 94.2 per cent responded yes, 2.6 per cent no, 3 per cent fair, and 0.2 per cent excellent. The rankings of "yes" for specific lessons varied from 72.7 per cent to 100 per cent.

In summary, in a daily, on-the-spot evaluation of the Geology Unit, teachers' responses were very positive. They reported that students were very involved with the lessons (91 per cent were attentive). In their professional opinion

and on the basis of actual classroom observations, teachers evaluated the internal and external structure of the lessons quite positively. Every lesson was seen as a very teachable unit and as a unit which was appropriately placed in the overall sequence of the lessons. The depth of treatment of each lesson was also evaluated positively on the basis of student response and understanding. The teachers judged that the means used to teach each lesson were appropriate.

The Comprehensive Science Tests were administered four times during the field testing term. Each test incorporated subject matter items covered in the instruction during the preceding class sessions.

Three types of test items were included in each of the four tests.

- (R) Retention - Questions designed to measure recall to information presented and learned in the sessions. On the four tests there were, respectively, 8, 11, 10, and 12 items of the retention type.
- (A) Association - Questions designed to measure how well students were able to identify basic concepts in the course and to relate them meaningfully to other concepts being taught. On the four tests

there were, respectively, 11, 13, 13 and 13 items of the association type.

- (P) Projection - Questions designed to measure how well students were able to apply basic concepts of the course in situations they had not previously encountered. On the four tests there were, respectively, 6, 9, 7 and 10 items of the projection type.

Samples of each type of test items are included in Appendix E and copies of the complete tests are on file at the Advancement School.

These tests were scored one point for each item correctly answered. Mean scores were then computed for two groups of schools: the first group made up of six schools comprising the experimental population (that is, schools running matched experimental and control groups); and the second group made up of 17 schools which field tested the geology unit but did not provide control groups. The mean scores were then converted to percentage correct and the results plotted in progress charts. The resulting curves for the first group (6 experimental schools) are shown in Figure 2. The results for the second group made up of the other 17 schools are shown in Figure 3.

The nature of the mental tasks called for by these tests gave rise to the following expected outcome: there would be a fairly uniform percentage correct scores for the four successive tests on the retention type items because students were generally familiar with the tests for factual information. On the other hand, students were less familiar with the association type and projection type items, therefore their scores on the earlier tests would be lower; but, the scientific reasoning being taught in the course might be reflected in improved performance on the later tests.

The curves in Figures 2 and 3 do not bear out these expectations. Instead all components of the tests, retention type as well as association type and projection type items showed fairly consistent improvement. Moreover the rates of improvement for the two groups of schools were quite similar on each type of test item as is indicated by the fact that the corresponding slopes of the curves in the two charts are nearly alike.

Scores for the first group of 6 experimental schools were consistently higher than for the second group of 17 schools. This difference was probably due to the fact that

no particular effort was made to equate the "experimental" schools either in student ability or teacher competence. The significant fact is that in both groups of schools the improvement was fairly consistent from one test session to the next.

An attempt was made to analyze the data further by computing the means for each of the 17 schools on each type of test. For three of the schools, data for at least three test sessions was not available. Of the remaining 13 schools the same general pattern of increasing scores was observed for 10 of the schools. The rates of increase differed somewhat from school to school as did the absolute values of the scores, but the overall trends were somewhat similar. (Complete tabular results for all the schools are presented in Appendix F)

C. Geology

2. Antecedent and Outcome Data

Two tests were administered at the beginning and at the end of the field testing period: a Test of the Understanding of Science (TOUS) and Interest and Ideas ( I & I).

The first of these tests (TOUS) consisted of 36 multiple choice questions covering various aspects of scientific method and procedures in logical reasoning. This test was related to the laboratory and field methods used in the geology unit, and it included data gathering methods, experimentation, logical inferences and similar mental operations brought into play in the course. However, it did not contain specific content from the field of geology.

Pre and post data obtained on TOUS from experimental and control classes in six schools are presented in Table 16. The Table contains mean scores (columns 4 and 5 respectively for pre and post test scores and column 6 for the pre-post test differences). To illustrate, for school 05, the experimental group's pre test score was 23.00 and the post test score was 23.75. The difference, .75 is not statistically significant. For this same school the post test score of the control group is 20.15, which is 3.60

less than the corresponding score of 23.75 for the experimental group. This difference of 3.60 is a significant difference and is so designated by the (b).

It is evident that, except for school 05, the mean pre test differences between experimental and control groups in each school separately and in all the six schools combined are not statistically significant. This result can be interpreted that the paired matching procedure used to set up the experimental and control students resulted in evenly matched and therefore highly comparable groups.

Significant pre-post test gains were observed for only two groups, the control group for school 07 and the experimental group for school 09. A further test of significance showed that only in school 07 was there a significant difference in the pattern of pre-post test change between the experimental and control groups, as shown by a significant f-ratio of 4.2, (column 7). The pattern of these changes is one in which the experimental group shows a slight pre-post decrease and the control group shows a somewhat larger pre-post test increase. This significant difference could, of course, be due to chance. However, if random error is not a

valid explanation, the pattern of change to be accounted for is contrary to the normal expectation of a larger increase in the experimental group than in the control group. That is, it would be necessary to find some factor in the teaching procedures or in other environmental conditions in school 07 that would account for a large pre-post increase in the control group and a somewhat smaller pre-post decrease in the experimental group. At the same time it would also be necessary to show that in the other schools these conditions did not exist. At this stage in the field testing project no such explanatory conditions have been observed.

The Interest and Ideas test is basically a 40-item attitude scale that deals with scientific values and indicates the extent to which the student is involved in scientific procedures.

Results (Table 17) obtained for the Interests and Ideas test were similar in many ways to those of the TOUS test. (Higher scores indicate more favorable attitudes toward science. The maximum possible score is 120 and 60 represents a neutral attitude). There were no pre-test differences between the experimental and control groups in any of the schools, indicating that the respective groups were well matched to assure comparability.

There were four groups, each in a different school, in which there was a significant change in pre-post test scores. In school 05 the control group increased, in schools 07 and 09 the control group decreased, whereas in only one school, 06, did the experimental group show a significant change, namely a decrease. Further in schools 05 and 09 the pre-post test changes of the composite experimental and control groups were significant, the change in group 05 being an increase and in group 09 a decrease. These tests of significance are indicated by f-ratios of 6.2 and 5.9 respectively (column 8).

There were no significant differences in the patterns of change between the experimental and control groups in any of the schools. (No significant f-ratios in column 7)

When results from all the schools are combined the pre-post scores showed a decrease for both experimental and control groups. Although not large enough to be statistically significant this trend is of some interest, since it is present in at least one of the groups in five of the six schools.

Pre test scores varied from a low of 41.10 for the control group in school 05 to a high of 79.23 for the control group in school 09. The range on the post test scores is somewhat smaller from 48.60 to 68.25. In terms of the scoring standards used for Interests and Ideas a score of 0 would be very unfavorable, 30 would be somewhat unfavorable, 60 would be neutral, 90 would be somewhat favorable and 120 would be highly favorable. Norms obtained from students in different grade levels and in different schools are not yet available so that the significance of the differences among the various schools in this study cannot be assessed.

Thus the results of the Test on Understanding Science and the Interest and Ideas show no consistent patterns and definitely do not conform to the expected pattern in which there is a greater relative pre-post improvement in the experimental than in the control group. Both of these tests are in the process of being developed. Further experimentation with them may show that in their present form these tests are not sensitive to the changes being brought about in students by the Geology unit. Therefore, it cannot be concluded that failure to demonstrate the expected pattern (greater pre-post gains in the experimental group) proves the Geology Unit to be ineffective.

D. Mathematics

1. Transactional Data

Transactional data for the mathematics field testing program consisted of three types of information.

- The teacher observations
- The Flander's Categories for Interaction Analysis
- The Math Fact Test

Teacher observation sheets were submitted by seven instructors. Four of these instructors were those assigned to the regular experimental groups in schools 11, 12, 14 and 15. The seven instructors submitted a total of 95 observation sheets on 18 lessons in the Problem Solving Unit. The following tabulation shows the number of evaluations submitted by each teacher and for each lesson.

Number of Lesson Evaluation Sheets
Submitted by each Instructor

| Instructor Number | Number of Evaluations |
|---|---|
| 1 | 10 |
| 2 | 19 |
| 3 | 13 |
| 4 | 17 |
| 5 | 14 |
| 6 | 6 |
| 7 | 16 |
| Total | 95 |

| Lesson Number | Number of Evaluations | Lesson Number | Number of Evaluations |
|---|---|---|---|
| 1 | 11 | 10 | 4 |
| 2 | 8 | 11 | 4 |
| 3 | 6 | 12 | 4 |
| 4 | 7 | 13 | 3 |
| 5 | 9 | 14 | 3 |
| 6 | 10 | 15 | 2 |
| 7 | 6 | 16 | 1 |
| 8 | 6 | 17 | 1 |
| 9 | 9 | 18 | 1 |
| | | Total | 95 |

## FIGURE IV

Observation sheet for math - problem solving

1. Student response

   a. Student interest in the assignment:

| percentage of students | | | | | |
|---|---|---|---|---|---|
| 15% | 30% | 50% | 70% | 85% | 100% |
| 1.1 | 7.4 | 24.2 | 23.2 | 35.8 | 8.4 |

   b. For most of the students, the material in this lesson is:

   Too Difficult 25.2% About right 68.4% Too easy 6.3%

   c. Have the students generally experienced a feeling of mastery of the problems in this lesson?

| percentage of students | | | | | |
|---|---|---|---|---|---|
| 15% | 30% | 50% | 70% | 85% | 100% |
| 4.2 | 17.9 | 22.1 | 30.5 | 22.1 | 3.2 |

2. Teacher response

   a. How would you rate your response to the materials and approach of this lesson?

   78.9% I like them. 4.2% I do not like them.
   14.7% I find them adequate, but nothing special. 2.1% no answer

   b. Do you feel that the diagrams were an effective tool in the understanding of the lesson's content?

   Yes 81.1% No 13.7% No answer 5.9%

   as compared with other materials:

   6.3% worse 26.3% same 63.2% better 4.2% no answer

3. Make any other comments here.

   A total of 43 comments were volunteered. These have been classified as follows:

   23 Students were enthusiastic, enjoyed it, like the novelty, understood better, improved, regained interest, liked the success experience, were motivated became involved, were helped by the diagrams.
   13 Students were not prepared, lacked background, were slow learners, lacked interest.
   7 Lessons too long, too difficult, confusing, incomplete.

From these tabulations it can be seen that each of the teachers submitted at least six evaluations and five of them submitted 13 or more evaluations. Some of these teachers taught the same unit to more than one class and therefore they may have submitted more than one evaluation per lesson. It can also be seen that each lesson was evaluated at least once and that the first nine lessons each received six or more evaluations.

All of the 95 evaluation sheets were pooled so that a composite analysis for all teachers and all schools resulted. The data are presented in Figure 4 which is an actual copy of the evaluation sheet on which have been entered percentage frequency of the response given for each answer possibility.

The results of the analysis show that the teachers feel that an average of about 75% of the students showed interest in the lessons and that approximately two-thirds seemed to show signs of having gained mastery of the material. More than two-thirds of the teachers considered the material about right in difficulty. Of those who felt the material was not right in difficulty most of them said it was "too difficult". More than three-fourths of the teachers said they liked the material and, more than four-fifths of them said the diagramming technique used to present the problem solving material was effective in helping

students understand the content of the lessons. Nearly two-thirds of the teachers rated the diagrammed materials better than other comparable material.

The Flander's Categories for Interaction Analysis consists of a procedure for observing and reporting teacher and student behavior and the interaction between them. Appendix G contains a detailed description of the method and materials. This instrument was used because it appeared to be well suited to describe teacher behavior and to identify precisely those instructional acts that might be most effective. Since it can be applied repeatedly it is a potentially useful method to describe changes in teacher behavior and also to provide feed-back to assist the individual teacher in modifying and adjusting his own teaching behavior.

One or two sessions in each of the five schools using the Probability and Problem Solving Units were observed. During the session a record was made every five seconds describing the teacher and student behavior in terms of the Flander's 10 categories. Table 18 contains a summary of percentage of the responses in each of the ten categories.

An informal rating by a field representative of the teaching effectiveness in the various schools does not show a close correlation with any of the categories. It is of interest, however,

that the highest rated school was number 12 and that the student initiation (category 9) was much higher than in any other school. School 13, rated next to lowest, showed an interesting relationship between categories, namely, whereas only 13% of the time was spent by the teacher asking questions, 43% of the time was spent in student responses. One might hypothesize that a teacher who could get students to talk more than 40% of the time by himself talking only a little more than 10% of the time would be a good teacher. These types of apparent contradictions suggest ample problems for further study.

The Math Fact Test consisted of a conventional examination containing 36 items and covering most of the topics in the Probability and Problem Solving units. A copy of the test is enclosed in Appendix D.

This test was administered to students in the experimental groups in the five participating schools. The same test was administered as a pre-test and as a post test at the end of the course.

The mean pre test score made by 121 students was 9.03; the mean post test score made by 115 students was 15.55.

The field representatives were of the opinion that the average gain of 6.52 indicated meaningful progress in mathematical competence of these students.

D. Mathematics

2. Antecedent and Outcome Data

Two achievement tests and an attitude scale were administered to the experimental and control groups to obtain pre and post test data in the five participating schools.

The achievement tests were the Stanford Achievement Tests - Arithmetic Computation and Arithmetic Applications (Advanced Battery). Form W was used on the pre tests and Form on the post test.

The attitude scale was the Interest and Ideas Test (I & I), the same scale as used in the Geology Unit, but modified by substituting math for all references to science.

It will be recalled that the treatment in the experimental groups consisted in the teaching of both the Probability and the Problem Solving units of the field testing program. The treatment in the control groups consisted of the regular instruction customarily given in the respective schools. All of the control group teachers used the material and course of study contained in the state adopted test for eighth grade mathematics. Unlike the procedure used in all the other field testing units, different teachers were assigned to the experimental and control groups.

It is evident that the experimental and control groups received somewhat similar treatment in that there was emphasis on computation in both groups. Thus it would be reasonable to expect both groups to make pre-post test gains. On the other hand, the experimental treatment provided in the Probability and Problem Solving units contained relatively more emphasis on math ideas and relationships. Thus it would be reasonable to expect the experimental groups to show greater pre-post test gains than the control groups on the Arithmetic Applications sub-test.

The results are presented in Tables 19 and 20. Mean raw scores for the pre and post tests are recorded in columns 4 and 5 respectively, and the results for the various experimental and control groups are shown in successive rows for each school. (Data for school 13 on the Arithmetic Applications is missing because the test was not given due to unexpected schedule changes at the end of the term.)

There were no significant pre test differences between the experimental and control groups except in school 12. In this school the pre test scores were significantly higher for the control group on both the Arithmetic Applications and Arithmetic Computation. The pre test difference for experimental and

control groups for all schools taken together was not significant. In general it follows that the experimental and control groups were equally matched and can be considered as being reasonably comparable.

On Arithmetic Computation significant and approximately equal pre-post test gains were made by both experimental and control groups when results of all schools were combined. Similar gains (significant and approximately equal) were observed for schools 11 and 15. In school 12 there were also about equal (but not significant) pre-post increase for the experimental and control groups. Thus in three of the schools both the experimental and control groups showed pre-post test increases as was anticipated. However, in the other two schools different patterns were observed. Thus for school 13 the experimental group made a significant increase but the control group decreased slightly; whereas for school 14 the experimental group decreased slightly but the control group made a significant gain.

In the Arithmetic Applications test the experimental groups showed positive pre-post test gains when results for all four of the schools were combined. On the other hand when the control group results of all four schools were combined there was

practically no pre-post test change. Moreover the pattern of pre-post test change for the experimental group as compared to the control group nearly reached a significance level as indicated by an f-ratio of 3.2.

The experimental groups in each of the four schools showed positive pre-post test gains and in two of the schools, 11 and 15, these gains were significant. The pre-post test changes for the control groups were somewhat different when results of the four schools were taken separately. In school 11 there was a significant decrease, and in school 12 the decrease was not significant. In school 15 there was a significant increase, and in school 14 the increase was not significant.

The relative pre-post test improvement was larger for the experimental group than for the control group in all schools except school 14.

These data suggest but do not fully confirm the original expectations regarding the instruction received under the Probability and Problem Solving Units. Thus, both experimental and control groups made significant and approximately equal pre-post test gains on the Arithmetic Computation as would be expected if the instruction in both groups contained somewhat similar emphasis on computation activities. Also, the

experimental group tended to perform relatively better than the control group on the Arithmetic Applications as would be expected as a result of the greater emphasis on problem solving and basic mathematical concepts in the experimental groups.

Differences were observed in the instructional approaches used in the experimental groups and there were also some differences in the students composing the various experimental groups. It is probable that these differences may have been responsible for some of the differences in performances from school to school, but it is not clearly demonstrated that these factors were responsible for the failure to fully confirm the expected results.

Some of the observed differences, referred to in the preceding paragraph, in instruction and in group make-up can be described:

- Independent information obtained by the field representative indicated that the experimental group in school 12 contained a large portion of slow learners. The low scores and the lack of improvement on both the Arithmetic Computation and the Arithmetic Applications would appear to support this observation.
- The instructor of the experimental group in school 14 gave evidence of his discouragement in teaching on the Junior High School level. This attitude may have affected his

teaching and may account for the relatively low post test scores. (However, it should be noted that results of the Interest and Ideas attitude scale to be reported below show some pre-post improvement rather than the large loss that might be expected in school 14).

It may be of interest to correlate student performance on the achievement tests with a field representative's rating of the teaching effectiveness in the five experimental classes. (Comparable ratings of teaching effectiveness in the control groups are not available). With the exception of the experimental group in school 12 containing slow learners there appears to be a relationship such that the groups with the higher rating in teaching effectiveness showed greater gains on the achievement tests.

| Rating: | Low | | | | High |
|---|---|---|---|---|---|
| School: | 14 | 13 | 11 | 15 | 12 |
| Pre-Post Gains: | | | | | |
| Arith.Comp. | -.77 | 2.62 | 3.04 | 3.00 | .13 |
| Arith.Apps. | .85 | -- | 1.56 | 2.11 | .22 |

The Interest and Ideas test (I & I) was used to measure possible changes in attitude as a result of the instruction received in the field testing groups. This was the same test used in the science classes. It was modified so that all

references were to mathematics instead of science. The maximum score possible was 120. The mid-point score of 60 indicated a neutral attitude. Higher scores indicated more favorable attitudes.

The pre and post test results obtained for the experimental and control groups in the five participating schools are presented in Table 21.

There were large differences in the pre test scores among both the experimental and the control groups. In all schools except 13 the control group scores were higher than in the experimental groups, but none of these differences were significant.

Pre-post test differences were not significant for any group except the control group in school 13 which showed a significant decrease.

The experimental group in school 13 also showed a large, although not significant decrease.

Although the general pattern suggests that the experimental group became slightly more favorable while the control group became somewhat less favorable, none of these changes were significant.

Thus, although it is not possible to conclude that positive attitude changes were produced by the Probability and Problem Solving units there is an indication that student performance conforms to the expected pattern. That is, that instruction in the Probability and Problem Solving unit appears to help students improve in both computational ability and in performance on arithmetic applications, whereas comparable groups receiving conventional instruction show improvement only in the computational activities.

E. Physical Education

1. Transactional Data

Only three of the six teachers using the Physical Education Unit returned observation sheets, and only one of the three responded to all of the lessons.

The teachers were asked to complete the following statements on each lesson: (A number in the chart represents the total number of teacher-judgments for the category in all the lessons.)

1. The level of physical skill for this lesson is:

| | Percentage of students | | | |
|---|---|---|---|---|
| | 25% | 50% | 75% | 100% |
| too easy | 16 | 3 | 2 | 0 |
| too difficult | 10 | 2 | 0 | 0 |
| about right | 3 | 6 | 23 | 5 |

(For example, there were sixteen judgments that the lessons were too easy for 25 per cent of the students.)

2. The amount of time allowed for the less is:

about right 28 too short 5 too long 2

3. The level of the informative material is:

| | Percentage of students | | | |
|---|---|---|---|---|
| | 25% | 50% | 75% | 100% |
| too easy | 24 | 1 | 1 | 0 |
| too difficult | 11 | 1 | 1 | 0 |
| about right | 3 | 14 | 17 | 1 |

4. Student responses:

| | 15% | 30% | 50% | 70% | 85% | 100% |
|---|---|---|---|---|---|---|
| a. enthusiasm for informative materials | 1 | 9 | 14 | 6 | 5 | 2 |
| b. enthusiasm for physical activities | 0 | 0 | 1 | 8 | 23 | 6 |

Thus, the majority of judgments are that the physical skill needed for the lessons is about right for 75 per cent of the students and too easy for 25 per cent of the students. Most judgments are that the amount of time allowed for the lessons is appropriate for the students. The level of informative material was rated most often as about right for 75 per cent of the students and too easy for 25 per cent. Eighty-five per cent of the students were judged to be enthusiastic about the physical activities but only 50 per cent were judged to be enthusiastic about the informative materials.

E. Physical Education

2. Antecedent and Outcome Data

It will be recalled that measures used to provide antecedent and outcome data in Physical Education consisted of parts of the Peacock Motor Skills Test and a knowledge test prepared at the Advancement School. Seven Peacock sub-tests used were: the 40 yard dash; standing broad jump; soft ball throw; soccer punt; side step; left grip; and right grip.

Due to individual absences or lack of equipment it was not possible to administer all the sub-tests to all students selected for the experimental and control groups. Nearly all of the 109

students in the experimental group and the 99 students in the control group took pre and post tests on the 40 yard dash, standing broad jump, soccer punt and side step. However, only 52 students in the control group took the soft ball throw. This lower number was due to the fact that the entire control class in one of the participating schools did not take part in this sub-test. The grip tests were administered to 35 and 28 students in the experimental and control groups respectively. These were the total groups from two of the test schools. Equipment for these tests was not available in the other schools.

The knowledge test was administered to 156 students in the experimental group and 126 in the control group. The larger number of students taking this test was due to the fact two additional schools took part in this test.

The results of the tests are presented in Table 22. The mean values presented in the table are raw scores (The procedures for administering and scoring these tests are presented in the field testing report describing the Physical Education program.

Efforts to match the students in the experimental and control groups on the basis of pre test scores were not successful. The pre test scores on all components of the Peacock were generally higher for the control group than for the experimental group.

(Column 4 - "Pre-test"). Although these differences were statistically significant only in the 40 yard dash, soft ball throw, and the soccer punt, the trends strongly suggest that the control group was generally somewhat better at the outset.

There were significant pre-post test gains by both experimental and control groups (Column 6 "difference") on all the subtests except the 40 yard dash and the soft ball throw (control group). On the standing broad jump and the soft ball throw the gains made by the experimental group were significantly greater than those made by the control group and on the soccer punt the experimental group's gains were only slightly short of being significantly greater than those for the control group. (Column 7 F values were respectively 11.2, 6.4 and 3.4)

On the knowledge test the experimental and control groups were nearly equally matched as indicated by nearly equal pre-test scores. The experimental group, having received instructions specifically related to the content covered in the knowledge test, made significant gains when compared to the pre-test scores and also when compared to the performance of the control group which made only a very slight pre-post test gain.

Although certain reservations should be kept in mind (such as the lack of precise matching between experimental and control groups), these results suggest that the instruction received in the Physical Education unit produced significantly greater gains in knowledge about physical education activities and in performance of certain skills than were made as a result of taking part in the school's regular physical education programs.

TABLE 22

PHYSICAL EDUCATION TESTS

| Test | N | Groups | Mean Scores: Pre Test | Mean Scores: Post Test | Mean Scores: Differ. | F-Values: Inter | F-Values: Pre-Post | F-Values: Exp-Cont |
|---|---|---|---|---|---|---|---|---|
| 40 yd Dash* | 109 | Exper. | 57.82 | 56.72 | -1.10 | 0.6 | 0.4 | 12.9 |
| | 98 | Control | 64.33 | 64.47 | .14 | | | |
| | | Differ. | -6.51(b) | -7.75(b) | | | | |
| Standing* Broad Jump | 109 | Exper. | 65.68 | 71.78 | 6.10(b) | 11.2(d) | 117.9(e) | 7.6(d) |
| | 96 | Control | 63.07 | 66.25 | 3.18(b) | | | |
| | | Differ. | 2.61 | 5.53(b) | | | | |
| Soft Ball* Throw | 107 | Exper. | 54.12 | 61.13 | 7.01(b) | 6.4(c) | 29.7(e) | 6.2(c) |
| | 52 | Control | 69.44 | 71.21 | 1.77 | | | |
| | | Differ. | -15.32(b) | -10.08(a) | | | | |
| Soccer Punt* | 108 | Exper. | 33.63 | 39.24 | 6.61(b) | 3.4 | 28.6(e) | 12.1(e) |
| | 89 | Control | 45.65 | 48.28 | 2. | | | |
| | | Differ. | -12.02(b) | -9.04(b) | | | | |
| Side Step* | 109 | Exper. | 17.89 | 20.57 | 2.68(b) | 0.03 | 37.5(e) | 1.3 |
| | 99 | Control | 18.92 | 21.44 | 2.52(b) | | | |
| | | Differ. | -1.03 | - .87 | | | | |
| Left Grip* | 36 | Exper. | 59.47 | 66.86 | 7.39(b) | 1.5 | 12.2(e) | 0.01 |
| | 28 | Control | 61.96 | 65.35 | 3.39(b) | | | |
| | | Differ. | -2.49 | 1.51 | | | | |
| Right Grip* | 36 | Exper. | 53.80 | 58.72 | 4.92(b) | 0.02 | 12.1(e) | 0.1 |
| | 28 | Control | 55.17 | 60.53 | 5.36(b) | | | |
| | | Differ. | -1.37 | -1.81 | | | | |
| Knowledge | 156 | Exper. | 21.45 | 29.25 | 7.80(b) | 164.4(e) | 268.9(e) | 47.6(e) |
| | 126 | Control | 20.34 | 20.94 | .60(a) | | | |
| | | Differ. | 1.11 | 8.31(b) | | | | |

t-tests (a) p .05 (b) p .01 (e) p .001 *Peacock Motor Skills Test

. Remedial Reading

The main purpose in field testing the Remedial Reading unit was to determine whether teachers without training or experience as reading specialists could, by means of the handbook prepared specifically for this kind of teacher, give such instruction to large classes.

The results of the field testing operation confirmed that such remedial reading programs can be set up and operated successfully. In this field trial, five teachers with little or no specialized training or experience, relying mainly on the guidance provided in the handbook, organized the classes and taught them successfully.

Teacher observation sheets were returned by four of the five participating teachers. Although qualitative in nature these reports provided descriptions of the strengths and the weaknesses of each lesson. All of the teachers regarded the taped lessons and transparencies as being very usable for instructional purposes. They reported a high degree of interest by students in the lessons. As may be expected for materials in the process of being developed many weaknesses were mentioned; all of these were constructive criticisms with suggestions for improvement.

Further attempts to evaluate this approach in terms of the reading improvement of the participating students were made, but it was not possible to set up the controls necessary to provide definitive answers. Thus in two of the schools pre and post tests were given but control groups could not be satisfactorily arranged for comparison purposes. In another school experimental and control classes were set up but no satisfactory data was available as a basis for matching pairs of students to form comparable experi- and control groups. In addition, the tests used were diagnostic instruments and may not be ideally suited to measure the reading achievement that may have taken place in these classes.

In spite of these limitations the data obtained in these tests appear to be of some interest and are presented below. Of special interest is the technique used to make pattern analyses in the Word Discrimination Test.

It will be recalled that the California Phonics Survey was administered as pre and post tests in three of the participating schools. In one of these three schools this same testing program was carried out with a control group.

The California Phonics Survey is a 75-item test divided into five basic units to provide variety in the mode of presentation and

to obviate any fatigue effect. The five units do not measure different kinds of phonic skill, but rather include items of different structural types.

The test items in this survey include all of the common speech sounds of the English language in their more usual spellings. Test items were kept simple by omitting spellings affected by regional pronunciations and by limiting the frequency of spellings that may be pronounced in more than one way. The standard error of measurement was used to establish the cutoff points to separate the students with adequate phonic skills and those with phonic difficulty.

The results for the experimental and control groups in School A are presented in Table 23 and the results for the experimental groups in Schools B and C are presented in Table 24.

As can be noted in Table 23, the experimental group had a larger decrease in the total number of errors between pre and post tests than the control group. Thus, the experimental group, gaining at a more rapid rate, made the same post test score as the control group in spite of a lower pretest score. These results were not subjected to significance tests because of the fact that comparability of the experimental and control groups could not be established.

There were also some uncontrollable events which may have resulted in some of the Remedial Reading techniques being inadvertently used in the control group as well as in the experimental. This, too, did not justify the extra effort of applying significance tests.

The results for schools B and C in Table 24 also show pre-post test improvements of about the same magnitude as in the experimental group in School A.

Because all three of the experimental groups show improvement, it may be worthwhile replicating these experiments using a more comprehensive test battery to measure a greater variety of the reading skills used in the 15 lessons of this field testing unit and also using a rigorously controlled experimental design.

In school A the experimental group as well as the control group were given the Huelsman Word Discrimination Test. Analyzing the results of this test afforded the opportunity of developing a special diagnostic procedure by means of the scoring technique used.

The Huelsman Word Discrimination Test consists of ninety-six items of varied configurations arranged in order of increasing difficulty. The purpose of the test is to see how well each student can determine lengths, internal details, general shapes of words, and visually discriminate among them. This test is also an

important aspect of developing a basic sight vocabulary for each individual.

The tests were graded by types of errors and a series of innovations were employed to highlight and bring certain patterns of mistakes to the surface. These patterns suggested such classified errors as inversions, confusion of consonants, confusion of vowels, confusion of mixed consonants and vowels, omissions of single letters, omissions of two or more letters, mixed syllabication, and repetition of vowels and consonants. The patterns of classified errors are as follows: b's mistaken for d's, d's for b's, m's for n's, n's for m's, r's for n's, n's for r's, n's for u's, u's for n's, m's for w's, w's for m's w's for v's, v's for w's, u's for a's, a's for u's, a's for o's, o's for a's, u's for o's, o's for u's and the omissions of letters.

The number of errors in each pattern was recorded and this resulted in a total list of classified errors. The sums of the unclassified and classified errors composed a total number of errors.

Within the control group, the number of pre test errors totaled 1,218, while the total number of errors for the post test was 973. The difference was 245.

The experimental group on the pre test, had a total of 1,035 errors, and on the post test compiled 726 errors. The difference was 309. As on the California Phonics Survey, both groups improved, with the experimental group showing a relatively larger gain.

The number of classified errors for both groups also shows a difference. For the control group, the pre test total of classified errors amounted to 951, while the post test total was 804. The difference was 147. In comparison, the pre and post test totals of the experimental group were 742 and 418 respectively. There was a difference of 324. This difference is more than twice the difference obtained from the results of the control group.

As may be expected, when the unclassified errors for both groups are considered the trends are the opposite of those observed for the classified errors. Thus in the control group, there was a total of 267 unclassified pre-test errors, and a total of 69 unclassified post test errors. The difference was 198. The experimental group's pre test total of unclassified errors was 293. In comparison, the post test total of unclassified errors was 308. This group had gained 15 errors in this category. These results are presented in Table 25 in summary form.

The results suggested in this study are that by classifying the errors in terms of the various kinds of recurring mistakes and then counting the number of classified errors, a more precise and clear-cut diagnosis can be made. That is, the classified errors are those which are observed to occur more than once both in the work of a given student and among several students. It may be worthwhile setting up further studies to validate this type of diagnostic test scoring and to apply the procedure in the diagnosis of individual students.

TABLE 23

CALIFORNIA PHONICS SURVEY

Control and Experimental Group School A

Control Group
N=24 on both pre and post test

| Test Section | Total No. of Errors Pre-Test | Post-Test |
|---|---|---|
| Consonant Sounds | 19 | 16 |
| Consonant Diagraphs | 22 | 7 |
| Consonant Blends | 465 | 321 |
| Blending Consonants and Rhyming Elements | 47 | 32 |
| Long and Short Vowels | 41 | 28 |
| Syllabication | 155 | 98 |
| Total Number of Errors | 740 | 502 |

Experimental Group
N=24 on both pre and post test

| Test Section | Total No. of Errors Pre-Test | Post-Test |
|---|---|---|
| Consonant Sounds | 23 | 9 |
| Consonant Diagraphs | 28 | 12 |
| Consonant Blends | 490 | 328 |
| Blending Consonants and Rhyming Elements | 54 | 20 |
| Long and Short Vowels | 30 | 29 |
| Syllabication | 181 | 102 |
| Total Number of Errors | 826 | 500 |

TABLE 24

CALIFORNIA PHONICS SURVEY

Experimental Group School B

N=26 students on both pre and post test

| Test Section | Total No. of Errors Pre-Test | Post-Test |
|---|---|---|
| Consonant Sounds | 28 | 19 |
| Consonant Diagraphs | 40 | 13 |
| Consonant Blends | 450 | 362 |
| Blending Consonants and Rhyming Elements | 60 | 53 |
| Long and Short Vowels | 51 | 46 |
| Syllabication | 207 | 126 |
| Total Number of Errors | 836 | 619 |

Experimental Group School C

N=25 students on both pre and post test

| Test Section | Total No. of Errors Pre-Test | Post-Test |
|---|---|---|
| Consonant Sounds | 21 | 19 |
| Consonant Diagraphs | 29 | 12 |
| Consonant Blends | 480 | 325 |
| Blending Consonants and Rhyming Elements | 53 | 41 |
| Long and Short Vowels | 47 | 33 |
| Syllabication | 171 | 102 |
| Total Number of Errors | 801 | 532 |

TABLE 25

HUELSMAN WORD DISCRIMINATION TEST

N=24 in experimental and control groups

CONTROL GROUP

| Pattern | Number of Errors | |
|---|---|---|
| | Pre-Test | Post-Test |
| Classified Errors | 951 | 804 |
| Unclassified Errors | 267 | 69 |
| Total Number of Errors | 1,218 | 973 |

EXPERIMENTAL GROUP

| Pattern | Number of Errors | |
|---|---|---|
| | Pre-Test | Post-Test |
| Classified Errors | 742 | 418 |
| Unclassified Errors | 293 | 308 |
| Total Number of Errors | 1,035 | 726 |

RESEARCH ADDENDUM B

Standard and Experimental Tests used in the Field Testing Assessment:

(1) Semantic Differential.

C. E. Osgood, G. J. Suci and P. H. Taunenbaum. The Measurement of Meaning. University of Illinois Press, Urbana, 1957.

(2) Flander's Categories for Interaction Analysis.

N. Flanders, Analyzing Teacher Behavior as a part of the Teaching-Learning Process. Ecucational Leadership, 19(1961-1962) 173-180.

(3) Barron-Welsh Art Scales

A portion of the Welsh Figure Preference Test Revised Art Scale (RA) and Barron-Welsh Art Scale (BW). George S. Welsh and Frank Barron, Consulting Psychologists Press Inc. Palo Alto, California.

(4) Torrance Tests of Creative Thinking.

E. Paul Torrance, Personnel Press, Inc., Princeton, New Jersey.

(5) Interests and Ideas. (I & I)

A research instrument of the Elementary-School Science Project and School Science Curriculum Project, University of Illinois, Urbana, Illinois. November, 1965. Revised on February 21, 1967 at the North Carolina Advancement School for mathematics.

(6) Test on Understanding Science.(TOUS)

E. O. Carrier, F. Geis Jr., L. E. Klopfer and P. B. Shoresman. The present form of this instrument is being used in the evaluation programs of the Elementary School Science Project and the School Science Curriculum Project, University of Illinois, Urbana, Illinois

(7) Stanford Achievement Test.

Advanced Battery, Forms W and X. Truman L. Kelley, Richard Madden, Eric F. Gardner, and Herbert C. Rudman, Harcourt, Brace and Worls, Inc.

(8) Peacock Motor Skills.

Dr. Bill Peacock, Department of Physical Education, the University of North Carolina, Chapel Hill, North Carolina.

(9) Word Discrimination Test.

G. B. Huelsman, Jr. 5835 Kimbark Avenue, Chicago, Illinois.

(10) California Phonics Survey.

Grades 7 - 12. G. M. Brown and A. B. Cottrell. California Test Bureau.

RESEARCH ADDENDUM C

## Instructions for Judging Writing Samples

Directions: You will be given several pairs of papers to score according to the criteria below (DETAILS, STIMULUS, TECHNIQUE, ART, FEELING). The two papers to be compared will have the same first six digits printed in red at the top of the page. Disregard the seventh digit.

On your scoring sheet, in column 1 under the heading labeled I.D. NUMBER, write the complete identification number (all 7 digits) of the first paper in each pair. In column 2 under I.D. NUMBER, write the I.D. number of the other paper.

Under the headings labeled DETAILS, STIMULUS, TECHNIQUE, place a check in the appropriate column for the paper which is <u>better</u> according to the criteria.

For example, if paper 234602-5 is the first paper (1) and shows the most effective use of details, place a check in column 1 under DETAILS to show that the first paper is <u>better</u>.

| I.D.NUMBER | | DETAILS | | | STIMULUS | | | TECHNIQUE | | | ART | | FEELING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 2 |
| 234602-5 | 234602-4 | ✓ | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

If paper 234602-4 is the second paper (2) and shows more projection from the stimulus than paper 234602-5, place a check in column 2 under STIMULUS.

| I.D.NUMBER | | DETAILS | | | STIMULUS | | | TECHNIQUE | | | ART | | FEELING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 2 |
| 234602-5 | 234602-4 | | | | | ✓ | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

If you can detect no difference between the two papers, place a check in column 0 under the appropriate heading.

For example, if you see no difference in writing technique between papers 234602-5 and 234602-4, place a check in column 0 under TECHNIQUE.

| I.D.NUMBER | | DETAILS | | | STIMULUS | | | TECHNIQUE | | | ART | | FEELING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 2 |
| 234602-5 | 234602-4 | | | | | | | | | ✓ | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Under the headings labeled ART and FEELING, you will put the number of examples of each in the proper column.

For example, if paper 234602-5 had 3 references to art forms, you would place the number 3 in column 1 under ART. If paper 234602-4 had 4 references to art forms you would place a 4 in column 2 under ART.

| I.D. NUMBER | | DETAILS | | | STIMULUS | | | TECHNIQUE | | | ART | | FEELING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 2 |
| 234602-5 | 234602-4 | | | | | | | | | | 3 | 4 | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

The example below shows that a judge comparing papers 234602-5 and 234602-4 found paper 234602-5 made better use of details, had 3 reference to art forms and had 2 feeling words; paper 234602-4 used more protection from the stimulus, had 2 references to art forms and had 5 feeling words. The judge could find no difference in writing technique between the two papers.

| I.D. NUMBER | | DETAILS | | | STIMULUS | | | TECHNIQUE | | | ART | | FEELING | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 1 | 2 | 1 | 2 |
| 234602-5 | 234602-4 | ✓ | | | | ✓ | | | | ✓ | 3 | 2 | 2 | 5 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Score all pairs in this manner. Leave columns labeled IMAGERY and QUANTITY blank.

# RESEARCH ADDENDUM D

## Math Fact Test

Date:_____ Name:_____

1. $\frac{2}{3} + \frac{3}{4} =$ _____

2. $\frac{9}{3} - \frac{6}{3} =$ _____

3. $\frac{2}{5} \times \frac{7}{8} =$ _____

4. $\frac{8}{9} \div \frac{2}{3} =$ _____

5. Write the fraction $\frac{5}{8}$ as a decimal. _____

6. Write the fraction $\frac{4}{5}$ as a percentage. _____

7. $5\frac{1}{3} + 2\frac{3}{5} =$ _____

8. $4\frac{2}{5} - 1\frac{4}{5} =$ _____

9. $2\frac{1}{2} \times 5\frac{2}{3} =$ _____

10. $6\frac{1}{2} \div 3\frac{1}{4} =$ _____

11. Write .036 as a percentage. _____

12. Write $16\frac{2}{3}$ % as a decimal. _____

13. Write the decimal .46 as a fraction. _____

14. Write 74% as a fraction. _____

15. Write .04% as a fraction. _____

16. $7.02 + 6\frac{3}{1000} + .9 + .014 + 5\frac{4}{10}$ = _____

17. 4.56 x .035 = _____

18. 14.03 - 2.946 = _____

19. 8.73 ÷ .003 = _____

20. A box contains 16 marbles of which 12 are red and 4 are white. If I choose one marble by chance what is the probability it is red? _____

21. The sum of two numbers is 58. If one number is three more than the other, what are the numbers? _____

22. The ratio of water to acid in a mixture is 3:5. If there are 15 quarts of acid, how many quarts of water are there in the mixture? _____

23. If there are 18 balls in a box, 10 red, 5 blue, and 3 white, what are the odds in favor of drawing a red ball? _____

24. A number decreased by $\frac{3}{5}$ of itself is 12. What is the number? _____

25. The sum of two number is 1. If an number is $\frac{3}{11}$, what is the other number? _____

26. The probability of choosing a red marble from box 1 is 2/3. The probability of choosing a red marble from box II is 3/5. If I choose one marble from each box, what is the probability of choosing two red marbles? _____

27. What number is $\frac{3}{7}$ of 49? _____

28. The sum of two numbers is 55. If the larger is four times as large as the smaller what are the two numbers? _____

29. In a game of chance the probability that Al will be chosen is 1/4; the probability of choosing Bill is 3/8 and the probability of choosing Ed is 3/16. What is the probability you will choose Al or Bill or Ed? _____

30. The product of $\frac{3}{4}$ and some number is 1. What is the number? _____

31. Three-fifths of what number is 39? _____

32. Two numbers have a sum of 84. If 1/4 of the larger is the same as 1/3 of the smaller what are the two numbers? _____ _____

33. What is the square root of 484? _____

34. In a certain class there 3/5 as many boys as there are girls. If the class has 32 students, how many boys are there? _____

35. What is the percentage loss when a person weighing 240 pounds is able to diet down to 220 pounds? _____

36. The sum of three numbers is 112. If the second is twice as large as the first, and the third is twice the size of the second, what are the three numbers? _____ _____ _____

RESEARCH ADDENDUM E

Sample items from Geology Test I

R* 1. Choose the 4 most abundant elements found in the earth's crust.

A. sodium, iron, mercury, gold
B. sodium, calcium, neon, iron
C. oxygen, hydrogen, carbon, nitrogen
D. oxygen, silicon, aluminum, iron

A* 9. The earth's crust is largely made of granite and basalt (granite and basalt are two types of rock). What two elements would you be most likely to find in granite and basalt?

A. mercury, nitrogen
B. iron, calcium
C. hydrogen, potassium
D. oxygen, silicon

P* 21. Salt is white, non-magnetic and water soluble. Sand is tan, non-magnetic and non-water soluble. A combination of these two may be best separated by:

A. tweezers and a hand lens
B. mixing with water then filtering
C. use of a magnet
D. heating

Sample items from Geology Test II

R* 3. The way light is reflected from the surface of a mineral is called its:

A. color
B. streak
C. luster
D. polish

A* 12. Batman has two objects in his utility belt. Object A has a low specific gravity; object B has a greater specific gravity. Which object would he throw away in order to more easily climb the bat rope?

A. object A
B. object B
C. neither A nor B
D. makes no difference

P* 27. Much of the western part of the United States is covered with rocks from volcanoes. You would expect to find:

A. many dark rocks
B. many light rocks
C. limestone
D. shale

Sample items from Geology Test III

R* 1. Which of the following was caused by ground water?

A. kettle hole
B. sink hole
C. man hole
D. drumlins

A* 11. Loan is always dark in color. The loan in site A is darker than the loan in site B, therefore:

A. site A contains less decaying vegetation and animal material
B. site A contains more decaying vegetation and animal material
C. site A has a more humid climate
D. site A has experienced erosion

P* 24. It would not be wise to buy river front property along:

A. the inside of a curve
B. the outside of a curve
C. a straight stream
D. none of the above

Sample items from Geology Test IV

R* 1. Which of the below is a good definition for "strike"?

A. the angle the rock bed makes with the level surface of the earth
B. a rock outcrop that is visible from the surface
C. the discovery of a syncline
D. the compass direction a rock bed follows

P* 24. You have discovered an area of exposed smooth slate with a dip of 30 degrees. This would make a:

A. good place for a picnic
B. good sliding board
C. good place to pitch a tent for the night
D. good place to build a house

A* 31. Which best describes the plant eating dinosaur?

A. small head, long teeth
B. large head, small teeth
C. small head, short teeth
D. large head, large teeth

* R - Retention; A - Association; P - Projection

RESEARCH ADDENDUM F

## Comprehensive Science Tests

### Number of Students (N) and Mean Percentage Correct (M)

| | School 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | M | N | M | N | M | N | M | N | M | N | M | N | M |
| Geology 1 | | | | | | | | | | | | | | |
| Retention (R) | 14 | 23.1 | 50 | 53.3 | 24 | 41.1 | 25 | 32.1 | 33 | 57.5 | 26 | 34.5 | 20 | 26.9 |
| Association (A) | 14 | 31.8 | 50 | 57.1 | 24 | 36.7 | 25 | 26.2 | 33 | 60.5 | 26 | 30.0 | 20 | 24.1 |
| Projection (P) | 14 | 23.7 | 50 | 42.3 | 24 | 34.7 | 25 | 30.0 | 33 | 44.8 | 26 | 38.3 | 20 | 32.5 |
| Total | 14 | 27.4 | 50 | 52.3 | 24 | 37.6 | 25 | 29.1 | 33 | 55.8 | 26 | 33.5 | 20 | 27.0 |
| Geology 2 | | | | | | | | | | | | | | |
| Retention (R) | 47 | 57.2 | 23 | 51.4 | 23 | 30.4 | 33 | 59.7 | 24 | 34.8 | 18 | 22.2 | | |
| Association (A) | 47 | 58.8 | 23 | 45.1 | 23 | 42.1 | 33 | 63.2 | 24 | 44.8 | 18 | 30.3 | | |
| Projection (P) | 47 | 53.9 | 23 | 41.0 | 23 | 26.6 | 33 | 60.2 | 24 | 38.9 | 18 | 22.8 | | |
| Total | 47 | 57.2 | 23 | 46.0 | 23 | 33.8 | 33 | 61.2 | 24 | 39.9 | 18 | 25.6 | | |
| Geology 3 | | | | | | | | | | | | | | |
| Retention (R) | 50 | 63.8 | 23 | 62.1 | 23 | 32.1 | 32 | 76.8 | 22 | 38.6 | 15 | 28.6 | | |
| Association (A) | 50 | 55.5 | 23 | 49.5 | 23 | 33.8 | 32 | 52.4 | 22 | 45.1 | 15 | 25.1 | | |
| Projection (P) | 50 | 54.3 | 23 | 50.9 | 23 | 31.6 | 32 | 64.7 | 22 | 40.9 | 15 | 18.0 | | |
| Total | 50 | 58.0 | 23 | 54.0 | 23 | 32.7 | 32 | 63.6 | 22 | 42.0 | 15 | 24.7 | | |
| Geology 4 | | | | | | | | | | | | | | |
| Retention (R) | 27 | 54.9 | 23 | 57.2 | 19 | 85.1 | 30 | 66.9 | | | | | | |
| Association (A) | 27 | 43.8 | 23 | 52.8 | 19 | 61.1 | 30 | 59.7 | | | | | | |
| Projection (P) | 27 | 49.6 | 23 | 52.1 | 19 | 64.2 | 30 | 73.3 | | | | | | |
| Total | 27 | 49.3 | 23 | 54.3 | 19 | 70.5 | 30 | 66.1 | | | | | | |

## Comprehensive Science Tests

### Number of Students (N) and Mean Percentage Correct (M)

| | School | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8 | | 9 | | 10 | | 11 | | 12 | | 13 | | 14 | |
| | N | M | N | M | N | M | N | M | N | M | N | M | N | M |
| Geology 1 | | | | | | | | | | | | | | |
| Retention (R) | 27 | 44.9 | 30 | 47.9 | 27 | 51.8 | 22 | 50.0 | 32 | 46.0 | 28 | 48.1 | 28 | 47.3 |
| Association (A) | 27 | 38.4 | 30 | 39.4 | 27 | 32.3 | 22 | 42.9 | 32 | 40.3 | 28 | 45.7 | 28 | 45.7 |
| Projection (P) | 27 | 35.2 | 30 | 40.0 | 27 | 30.8 | 22 | 39.3 | 32 | 31.2 | 28 | 47.5 | 28 | 43.3 |
| Total | 27 | 39.5 | 30 | 42.2 | 27 | 38.2 | 22 | 44.4 | 32 | 40.0 | 28 | 47.0 | 28 | 45.7 |
| Geology 2 | | | | | | | | | | | | | | |
| Retention (R) | 26 | 46.5 | 29 | 45.1 | 24 | 50.0 | 20 | 50.3 | 29 | 34.7 | 28 | 58.1 | 27 | 57.5 |
| Association (A) | 26 | 52.6 | 29 | 52.8 | 24 | 50.0 | 20 | 56.1 | 29 | 41.1 | 28 | 62.1 | 27 | 63.2 |
| Projection (P) | 26 | 43.6 | 29 | 40.9 | 24 | 41.7 | 20 | 45.4 | 29 | 32.6 | 28 | 53.6 | 27 | 53.4 |
| Total | 26 | 48.2 | 29 | 47.0 | 24 | 47.7 | 20 | 50.7 | 29 | 36.7 | 28 | 58.4 | 27 | 58.7 |
| Geology 3 | | | | | | | | | | | | | | |
| Retention (R) | 26 | 63.0 | 29 | 53.1 | 22 | 63.1 | 20 | 51.0 | | | | | | |
| Association (A) | 26 | 58.8 | 29 | 45.3 | 22 | 41.9 | 20 | 44.2 | | | | | | |
| Projection (P) | 26 | 54.3 | 29 | 46.3 | 22 | 42.9 | 20 | 48.6 | | | | | | |
| Total | 26 | 59.2 | 29 | 48.1 | 22 | 49.2 | 20 | 47.5 | | | | | | |
| Geology 4 | | | | | | | | | | | | | | |
| Retention (R) | 25 | 48.7 | 30 | 51.1 | 25 | 90.0 | 19 | 51.8 | | | | | | |
| Association (A) | 25 | 49.2 | 30 | 49.5 | 25 | 67.7 | 19 | 50.2 | | | | | | |
| Projection (P) | 25 | 50.0 | 30 | 48.3 | 25 | 52.4 | 19 | 50.0 | | | | | | |
| Total | 25 | 49.5 | 30 | 50.5 | 25 | 71.1 | 19 | 50.7 | | | | | | |

## Comprehensive Science Tests

Number of Students (N) and Mean Percentage Correct (M)

| | SCHOOL 17 | | TOTAL Schools 1 - 17 inclusive | |
|---|---|---|---|---|
| | N | M | N | M |
| **Geology 1** | | | | |
| Retention (R) | 30 | 42.5 | 487 | 44.9 |
| Association (A) | 30 | 39.1 | 487 | 42.5 |
| Projection (P) | 30 | 36.0 | 487 | 38.8 |
| Total | 30 | 39.4 Total | 487 | 42.5 |
| **Geology 2** | | | | |
| Retention (R) | 30 | 48.7 | 451 | 48.1 |
| Association (A) | 30 | 48.7 | 451 | 52.3 |
| Projection (P) | 30 | 50.3 | 451 | 45.0 |
| Total | 30 | 49.2 Total | 451 | 48.9 |
| **Geology** | | | | |
| Retention (R) | 30 | 55.6 | 364 | 57.5 |
| Association (A) | 30 | 55.1 | 364 | 49.4 |
| Projection (P) | 30 | 51.9 | 364 | 49.3 |
| Total | 30 | 54.5 Total | 364 | 52.1 |
| **Geology 4** | | | | |
| Retention (R) | 30 | 59.2 | 299 | 61.2 |
| Association (A) | 30 | 51.8 | 299 | 54.3 |
| Projection (P) | 30 | 58.3 | 299 | 55.1 |
| Total | 30 | 56.2 Total | 299 | 57.0 |

RESEARCH ADDENDUM G

# Flanders Categories for Interaction Analysis

## Purpose

Most teachers are interested in evaluating their own teaching and the attitudes of their students, but they have no systematic means for gathering this information. The Flander's Categories for classroom interaction is a tool which enables observers to analyze a classroom situation objectively and then to quantify the interaction so that it is possible to see just how much time is spent in various types of activity.

As a training tool, interaction analysis provides the teacher with relatively objective data about his own behavior. A teacher can define his teaching goals and after having learned exactly what is going on in his classroom, learn new teaching strategies which will facilitate the attainment of these goals.

## Explanation of System

An observer can be trained to classify the verbal statements of classroom communication into one of ten categories once every five seconds (see Chart I). Seven categories are assigned as teacher talk, two as student talk, and one as silence or confusion. The categories

of teacher talk are: using student feeling constructively, giving praise, clarifying student ideas, or asking questions--which are called indirect influence; and lecturing, giving directions or justifying authority--which are called direct influence.

It is believed that direct influence tends to restrict the student's freedom of action and indirect influence tends to expand freedom of action.

It is assumed that there is some optimum balance of direct and indirect influence, which changes from one class activity to the next (for the same teacher) which will maximize learning.

The two categories of student talk are: 1) talk made in response to a teacher-initiated contact, and 2) talk initiated by the student.

The observer records his data by writing down the category number every five seconds. The column of numbers preserves the original sequence of events.

EXAMPLE:

| Recorded Numbers | Explanation |
|---|---|
| 4 | The teacher asked a question |
| 8 | The student responded directly to question |
| 2 | The teacher praised the response |
| 3 | The teacher then elaborated the student's ideas |

We tabulate these numbers as sequence pairs, two numbers for each pair. The tabulation is made on a ten by ten matrix, the first number

to indicate the row and the second to indicate the column. Each pair overlaps the next so that a number is used in one pair to indicate the column and in the next to indicate the row. For example, if you had a list of numbers that looked like this: 4, 8, 7, 8: you would begin by putting a mark in row 4, column 8. Your next mark would be in row 8, column 7, etc.

The column totals of such a matrix show the proportion of time spent in each category. The other 100 cells of the matrix reveal the frequency of two events within the category system. Look at the matrix in Chart II. In this example there are several 5-5 indicating that the teacher was lecturing for the greater majority of the class period. There were a few 5-9, 9-5 indicating that the students initiated questions or ideas of their own and these responses were followed by the continuation of teacher lecture. This pattern could be improved if the teacher allowed more 9-9, 8-8, and used more 4 (asking questions), 2 (praise), and 3 (elaboration of student ideas). In this way there would be more student involvement and consequently, more interest.

CHART 1

Flanders Categories for Interaction Analysis, 1969

| | | |
|---|---|---|
| TEACHER TALK | INDIRECT INFLUENCE | 1.* ACCEPTS FEELING: accepts and clarifies the tone or feeling of the students in an unthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.<br><br>2.* PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, but not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included.<br><br>3.* ACCEPTS OR USES IDEAS OF STUDENT: clarifying, building, or developing ideas suggested by a student. As teacher brings more of his own ideas into play, shift to category 5.<br><br>4.* ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer. |
| | DIRECT INFLUENCE | 5.* LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.<br><br>6.* GIVING DIRECTIONS: directions, commands, or orders which students are expected to comply with.<br><br>7.* CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from unacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference. |

| | |
|---|---|
| STUDENT TALK | 8.* STUDENT TALK--RESPONSE: talk by students in response to teacher. Teacher initiates the contact or solicits student statement.<br><br>9.* STUDENT TALK--INITIATION: talk initiated by students. If "calling on" student is only to indicate who may talk next, observer must decide whether student wanted to talk. |
| SILENCE | 10.* SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer. |

*There is NO scale implied by these numbers. Each number is classificatory, designating a particular kind of communication event. To write these numbers down during observation is merely to identify and enumerate communication events, not to judge them.

## CHART II

### Flanders Matrix for Interaction Analysis

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| TOTAL | | | | | | | | | | | |

# SECTION III

# APPENDICES

# APPENDIX A

## FALL PHASE I

| Subject | Teachers | Classes | Schools | Systems | Students |
|---|---|---|---|---|---|
| Reading | 10 | 11 | 9 | 8 | 329 |
| Science | 25 | 28 | 23 | 10 | 924 |
| Physical Education | 6 | 6 | 66 | 5 | 180 |
| Communications | 12 | 14 | 8 | 8 | 397 |
| Math | 4 | 4 | 4 | 4 | 134 |
| | 57 | 63 | | | 1,964 |

## WINTER PHASE II

| Subject | Teachers | Classes | Schools | Systems | Students |
|---|---|---|---|---|---|
| Reading | 13 | 13 | 13 | 10 | 416 |
| Science | 24 | 26 | 23 | 16 | 832 |
| Physical Education | 7 | 12 | 7 | 6 | 394 |
| Communications | 19 | 30 | 14 | 12 | 950 |
| Grammar | 16 | 27 | 9 | 7 | 877 |
| Math | 10 | 16 | 10 | 4 | 400 |
| Urban Studies | 4 | 4 | 3 | 3 | 122 |
| Games | 12 | 13 | 12 | 7 | 365 |
| | 105 | 141 | | | 4,356 |
| Total | 162 | 204 | *73 | *32 | 6,320 |

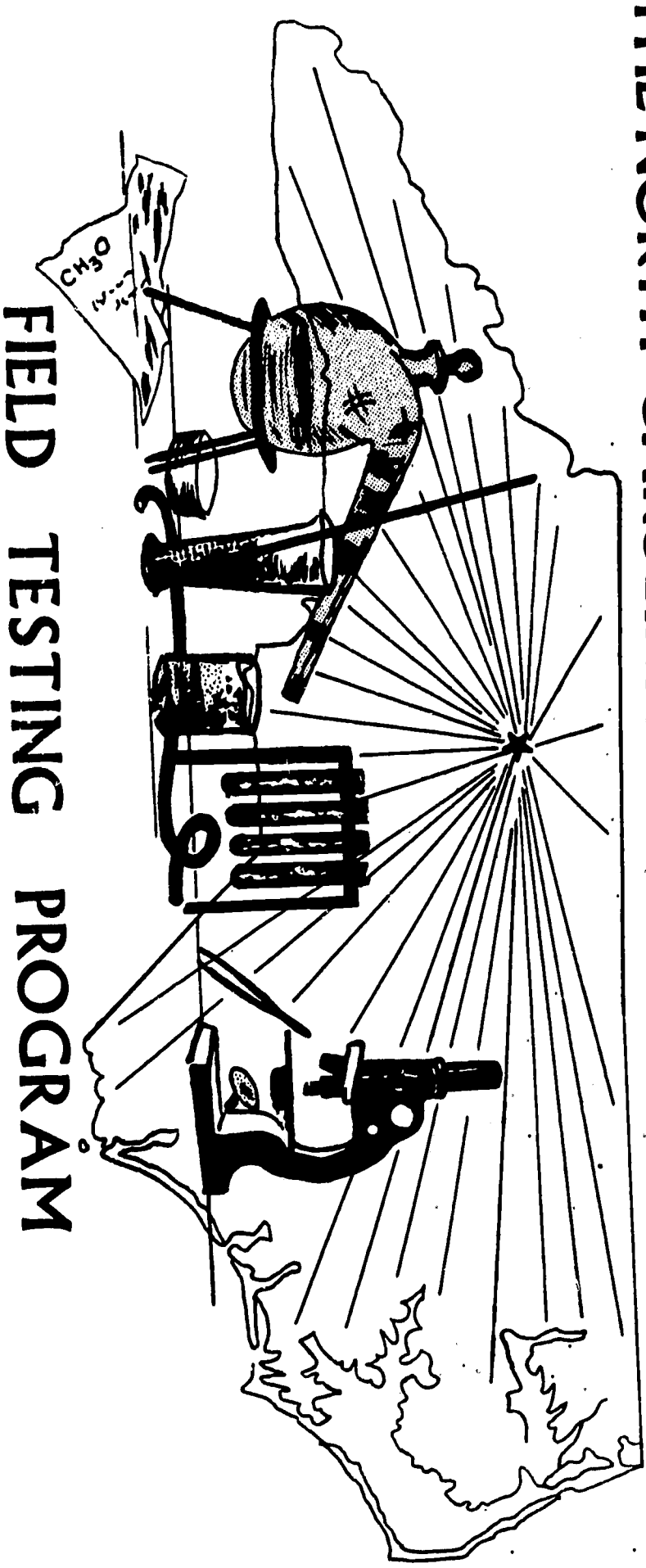
*These figures represent the total number of different schools and different school systems. Some units were tested in the same schools that tested other units. Additionally, one non-public school and one community college field tested materials.

# North Carolina Advancement School

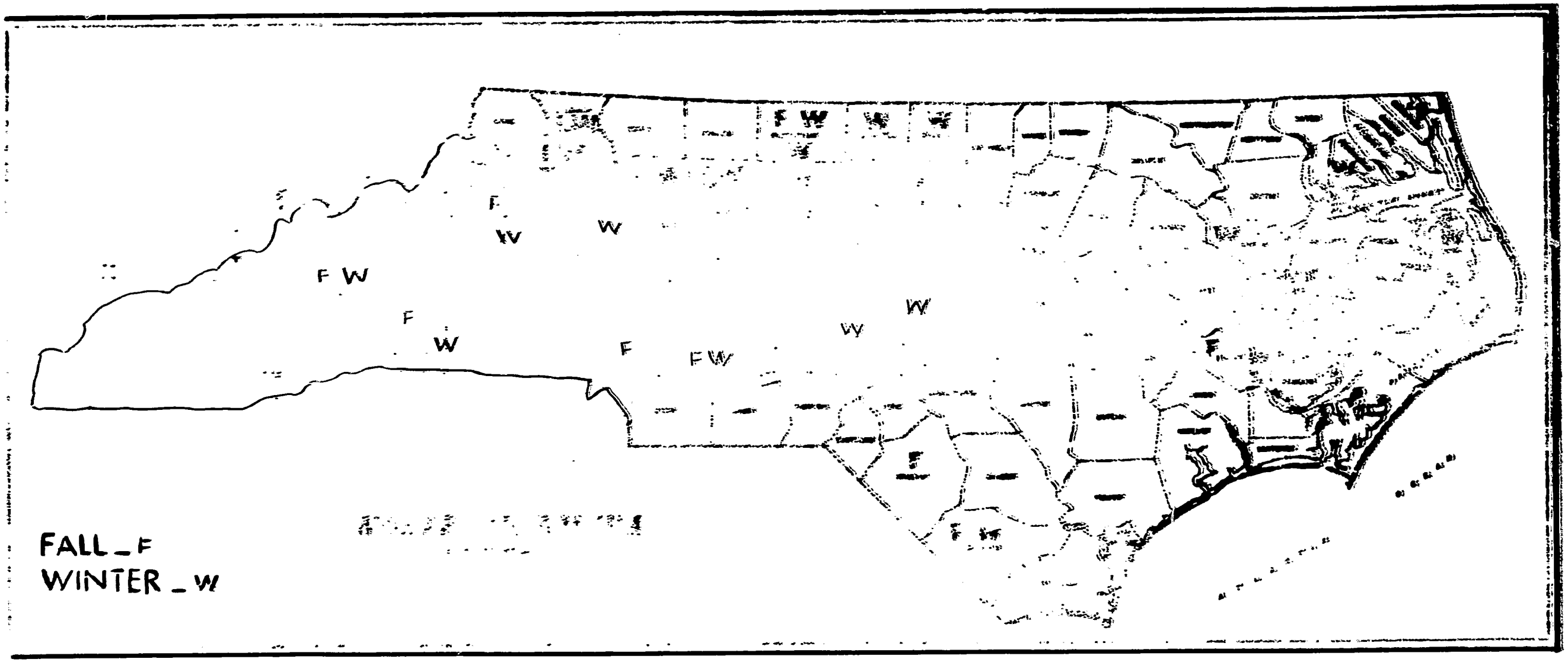
Winston-Salem, N.C.

THE NORTH CAROLINA ADVANCEMENT SCHOOL

FIELD TESTING PROGRAM



# APPENDIX C




## NORTH CAROLINA SCHOOL SYSTEMS THAT HAVE PARTICIPATED IN THE FIELD-TESTING PROJECT OF THE LEARNING INSTITUTE OF NORTH CAROLINA

# APPENDIX

## GEOLOGY FIELD TEST[illegible]

### I. HISTORY OF THE GEOLOGY UNIT

The North Carolina Advancement School's science department during the first two years, worked toward the development of a [illegible] course aimed at stimulating underachieving boys. These eighth grade boys from across the State attended the School for ten to twelve week sessions. Two considerations governed the science department's selection of geology as a unit to be developed at the School. One was that it would fit in with the public school's newly adopted earth science program, geology being its core. The other was that it might appeal to teachers, many of whom were unfamiliar with the new course.

Not only did the permanent staff members confer with each other about the methods and materials to use, but they also encouraged suggestions from the visiting teachers who came with the boys each session. The program was developed largely by responses from eighth graders who came to the School. This is a unique approach to developing a curriculum. The unit was developed from the beginning with the idea it would have to create a lot of interest in the underachieving boys at the School. The boys attending the North Carolina Advancement School possess several of the following general characteristics: (1) poor reading (low reading skills-dislike for reading). (2) are not in love with school. (3) a dislike for lecture-question and answer approach. (4) a short attention span. (5) a poor self-image. Thinking of these characteristics, the staff sought to produce a unit that would attempt to create an interest in school, in their teachers,

and especially in science. The staff thought that the development of a wholesome attitude would be as important as teaching the content.

The course has been developed with little required reading; however active student involvement has been heavily emphasized. In nearly every class the student is physically involved in the lesson by use of the lab, classroom projects, discussions, etc. The Educational Technology Department of the North Carolina Advancement School helped to make the course extremely visual. There are sixty-five overhead transparencies, many with a series of overlays that illustrate certain geological concepts with which the lessons involve. There are one hundred fifty colored slides showing geological formations, individual rock and mineral samples and field trip sites. The staff recognized that a geology course is more interesting and practical if the students can go out to field sites and see how the various formations appear in nature after being exposed to them in the classroom. It is also naive to think all schools in North Carolina will have a suitable field site or the time to take the "little scholars" on such a trip. The field trips are then simulated by use of colored slides in order to expose all students to various natural phenomena. This does not discourage the teacher from going on field studies if at all possible. The imaginary field trips are illustrated to the students, not only by slides but also by actual samples of each rock and mineral that could be collected. There are large samples for teacher demonstrations and follow-up labs and thumb-nail size samples for each student to identify and mount for his personal collection. Included in the unit

are commercial rocks and minerals, chemicals, filmstrips, film loops, recommended films and many other supplies to aid the teacher in effectively teaching geology to eighth graders.

The syllabus is fifty-two lessons in length with a geological concept emphasized with each lesson. (A table of contents for the syllabus may be found in the appendix.) A listing of the needed materials and a suggested procedure for teaching the lesson comprise the bulk of the syllabus. The course covers five major topics: (1) Rocks and Minerals, (2) Forces that Sculpture the Earth's Surface, (3) Forces that Build Up the Earth's Surface, (4) Earth History and (5) Topographical Mapping. The unit begins with atoms and builds up to the complex structure of landforms.

The permanent science staff and visiting teachers felt the unit to be very effective in teaching the boys at the North Carolina Advancement School. A geology consultant, Dr. William Moorehead, had high praise for the methods and materials and thought it very teachable. After nearly two years of work and many staff conferences and revisions, the geology unit was ready to be exported to the public schools. The North Carolina Advancement School, by the terms of its charter, is committed to work, not only with underachievers coming to the School, but also to develop methods and materials that can be used effectively in the public schools. This field testing of the program would reveal two things: (1) the effectiveness of the program in meeting its objectives in the public schools where the environment is much different and (2) the degree to which the teacher is aided in developing and improving his teaching style.

## II. THE FALL AND SPRING FIELD TESTING

The initial procedure used for disseminating the material was to notify superintendents that a geology package existed and would be available for testing by interested school systems. The teachers concerned simply notified the director of the field testing project and he arranged a meeting with the department representative. The North Carolina Advancement School's science representative would then contact the teachers, principals, supervisors and describe the program, what it involved and discuss the prospects of participating in the field testing program. The interested teachers were then invited to a conference at the North Carolina Advancement School to orient everyone to the methodology and techniques used in the syllabus and the evaluation plan for the fall term.

The fall conference, which was conducted by the project director and the science staff, took place on a Friday night and Saturday. It was attended by twenty-five teachers, several administrators, and the North Carolina state science supervisor. The history and some of the philosophy behind the development of the unit was discussed along with the procedure for evaluating each lesson presented. Perhaps the most beneficial aspect of the conference was an orientation to each lesson which described the methodology involved. The individual kits, which consisted of a syllabus and all of the materials needed to teach the unit, were given to the teachers following the conference.

The teachers were advised that periodic visits would be made by the science field representative, emphasizing that the visits were

being made primarily to be of assistance to the teacher. On such visits, previously taught lessons would be discussed, with an attempt to gauge student and teacher reaction. The field representative tried to talk with the teacher, students and administrators on most of these visits. The administrators from the beginning had been encouraged to observe these experimental classes and help to evaluate the program. Most principals and supervisors were very excited and did visit the classrooms, but it was not 100 per cent involvement.

The visits by the field representative were held at two to three week intervals. The teachers had been informed at the conference to feel free to call or write the science department if any questions arose over methods, materials, etc. With this type of understanding the two to three week visits seemed often enough.

The fall evaluation of the program consisted of the observations of administrators and the field representative, along with a subjective evaluation of each lesson by the teachers. There was a guide given as to some points the teachers might look for in evaluating the individual lessons. The science staff received much feedback from the teachers mailing in these periodic evaluations; however, it was difficult to work with because of its subjective nature.

As a result of the fall experience and relying on the advice of a research consultant the science staff realized the spring evaluation would have to be more sophisticated and much more objective. In drawing up the spring research design the staff decided to devise objective tests that would be given at logical intervals throughout the term.

There were three types of questions to be written from each lesson: (1) retention, (2) association and (3) projection. To compose this test the North Carolina Advancement School's science department, with the aid of its research person, invited three teachers who participated in the program during the fall. A day was spent devising such tests, and this time allotment was not enough. There were four such objective tests to be given and the answer sheets mailed to the North Carolina Advancement School for scoring and processing.

The fall term concluded with the teachers again being invited to the North Carolina Advancement School for a week-end to evaluate the work of that term. This conference opened with a few general remarks about the positive and negative aspects of the fall's testing program. The new spring evaluation plan was then fully explained and much time spent on the form to be completed by the teacher. (A copy of this form appears in the appendix.) The teachers were also told that six of them would be randomly selected to have control and experimental classes. These classes would take two pre and post tests. The tests used are experimental ones developed at the University of Illinois and the norms will not be available until the fall of 1967. The tests are also being used in the evaluation programs of the Elementary School Science Project and the School Science Curriculum Project, University of Illinois, Urbana, Illinois. One test, "Interest and Ideas" was to measure attitudinal changes. The second, "Test on Understanding Science" was to mearsure a child's ability to understand the methods of science. These tests would be administered by someone from the North Carolina

Advancement School rather than the teacher. The control and experimental classes were composed of pairs of students matched according to race, sex, I.Q., achievement, and socio-economic background.

In discussing the evaluation plan for the spring term the four objective tests were described and the teachers were instructed not to look at the copies of the test given them in sealed envelopes before they were administered. Following the discussion of this plan, the teachers were divided into three groups and each group discussed 1/3 of the syllabus in great detail. The groups were to keep in mind how the lessons could be revised to make them more experimental. The conference was attended by research and geology consultants who offered many valuable suggestions to each group. After the lessons were discussed, a member of each group gave a report on the changes recommended for each section. The teachers not only had an opportunity to react to this, but were mailed copies of the suggestions made. A copy of the suggestions appear in the appendix.

The consensus of opinion was that the unit had been a big success but could be even better with some revisions. It had created a lot of interest among students who normally had not cared for the routine of classwork. The visuals and student involvement had generated interest that resulted in students completing projects outside of class that had not been assigned.

The following four pages represent a reply from the fall group of teachers and administrators to a questionnaire about the geology unit.

What do you feel the students are learning which is of greatest value?

"The idea of building the unit around certain basic concepts of geology seems quite valuable. If a child lacks any interest in his environment I think the unit will probably have stimulated that interest by the end. I can see signs of this now."

"The students are getting a good concept of earth science and natural processes which this involves."

"The students are forced to draw conclusions in using this material. Most textbooks tell a student in the beginning what he is to look for - this material leads a student to understanding."

"Better opportunities to have real experiences while learning."

"My students have become more curious, open-minded and observant; therefore, I consider the development of a scientific attitude to be of greatest value."

"I believe the students are learning broader concepts- rather than numerous small facts."

"These chances to show that they can do are great."

"A taste for earth science."

List what you feel are the best aspects of the materials.

"The organization of this material is superb!"

"Learning increases without a large amount of reading."

"Just having suggested materials is a help to teachers."

"The materials provide students with firsthand observations and experiences which help them to better learn the concepts being taught. They also make provisions for learning through group situations which is profitable."

"Use of minerals and rocks to handle along with filmstrips and transparencies to illustrate different concepts."

"There is a variety of materials available when you need them."

"The work is both simple and enjoyable for the students. This gives satisfaction and creates pride in their work."

"Anything that is different from reading strictly from their book makes for better class experiences."

"The amount of student activity."

List what you feel are the weakest aspects of the materials.

"No words from which to make a test."

"The student handouts are good, but they might be improved in some areas by allowing more time for follow-up and evaluation."

"Not enough suggested homework."

"Sometimes use of instructional material without enough background."

"While working in small groups there is a tendency for one or two to take such active parts that some students tend to be left out."

"Some lessons do not go into detail enough."

"Need more lessons on rock identification."

"Students sometimes feel they are not learning anything under this program because they are use to the formal atmosphere."

"Lack of testing materials."

"The material does not have a weak point. The schedule in our school presents a time shortage. Therefore, all material is not covered, but the students interest has been aroused to such a point they seek more information outside of class."

What suggestions can you make which will aid us in improving the field testing program?

"Correlate assignments from various books to use along with lessons. Begin each lesson with 5-8 minute review. Include tests."

"Suggest a definite understanding of amount of time or suggestions of certain lessons that might be omitted if necessary."

"More work with sedimentary and metamorphic samples to produce recognition."

"A testing program that would be uniform and allow teachers to see how many facts the North Carolina Advancement School would like included to help a child understand each concept."

"Perhaps include all eighth grade science teachers at a given school."

"Possible student evaluation of the unit from time to time."

"For some lessons more time and reading material is needed."

It is the feeling of the field representative that the unit helped the teachers tremendously, but in different ways. The teachers would be placed in one of three categories with each benefiting in slightly different ways. One category is the group of experienced science teachers with good backgrounds in earth science. This group of teachers were accustomed to using a problem solving approach to teaching, but the impressive thing to them was the amount of student involvement and the organization of lessons. Many teachers in this category said they had never been able in the past to have the continuity to their lessons as the geology unit possessed. To this group the increased amount of student activity combined with the continuity of lessons was the biggest asset.

The second category was comprised of teachers who were using some lab activities, but without the problem solving approach. The lab approach used in the past had been one of giving detailed instruction about procedures and results. There was little groundwork done to arouse one's curiosity to want to go in the lab and discover things for himself. This group profited most by realizing they could get good results on comprehension and at the same time develop an enthusiasm for earth science. They also recognized the importance of a problem solving approach, i. e., not giving the students all the answers before doing some activity.

The third category had done practically no lab work in the past. The few experiments that had been carried out were mostly teacher demonstrations. Of most benefit to the third group were the suggestions

offered and the new materials received from the North Carolina Advancement School. The combination of these two aids resulted in greater interest and understanding among the students of fundamental geological principles.

The six teachers who were randomly selected to have control and experimental classes represented the three geographical areas of the state. An analysis of the data obtained from the pre and post tests, objective tests and daily evaluations will be found in the appendix.

The teachers unanimously were concerned with the objective test scores. Many of these tests were scored by teachers before they were mailed to the North Carolina Advancement School. The North Carolina Advancement School science department and a majority of the participating teachers feel there are two major reasons for the rather low scores. Poor reading skills and lack of prior experience with association and projection questions reflected the low scores.

The frequent visits by the field representative during the spring had a dual purpose. The primary concern of the field representative was to assist the teachers in maintaining the methodology of the unit. A secondary purpose of the visits were to seek teacher reaction to several aspects of the program. These lesser purposes involved a discussion of the spring evaluation procedure, further revisions of the syllabus and the future of the geology unit. Teacher reaction to the latter point was that the unit should be made available to schools that would like such a program. They also suggested ways to effectively implement mass dissemination.

# III POSSIBLE PLANS FOR FUTURE DISSEMINATION OF THE GEOLOGY UNIT

The North Carolina Advancement School science department feels that major consideration should be given to orienting new teachers to the methodology, if the unit is widely disseminated. The methodology is such a vital part of the unit the staff feels that a significant portion of the materials effectiveness could easily be lost in mass production unless consideration is given to the methods and techniques employed. Many of the participating teachers expressed the need for a teacher orientation session at the beginning. The suggestion was made by a field testing teacher and supported by the North Carolina Advancement School science staff that a possible way to orient the teachers participating in a large dissemination program would be to seek the assistance of the consenting teachers involved in the field testing program this year. These teachers are familiar with the methods and materials used in the syllabus and could describe them to teachers in their systems as well as surrounding administrative systems. If most of the teachers who were involved this year agreed to the project, it would cover many of the state's school systems. This type of workshop might best be conducted in two sessions. The initial session would describe the history and philosophy of the unit, along with a thorough orientation to the methods and materials used in the first half of the syllabus. The second session, coming some weeks later, would be used to clear up questions that might develop as well as to discuss the last half of the syllabus.

In areas of the state where no field testing teachers are available to conduct such a conference, the North Carolina Advancement School might work on one of several possible solutions. School personnel in these areas of the state might identify several key people from the different administrative systems who could come to the Advancement School for a week-end conference. At the conclusion, these people would be responsible for having a similar conference with the teachers in their system. Another possible alternative is to have a representative from the North Carolina Advancement School conduct such a conference in the field. This may not be feasible if the area is very large. Regardless of who conducts the conference, the North Carolina Advancement School would have a representative available to assist with these workshops if needed and would continue to work with the field evangelist during the year.

The science staff of the North Carolina Advancement School would prefer to conduct summer programs for teachers interested in working with the units the following year. The teachers would come to the North Carolina Advancement School for six or eight weeks during the summer and receive a stipend. The summer institute would focus on three areas each day. First, the teachers would receive an orientation to the North Carolina Advancement School prepared science programs and the methodology involved. The second phase of the day would be to let the teachers team teach the units to students attending the school. This would allow the teachers to learn by doing and also reinforce the orientation sessions. The third area would allow teachers

to develop science programs of their own. The teacher would be grouped according to their area of interest in earth science. The teacher-developed programs would incorporate ideas of their own as well as ones emanating from group discussions. This type of institute would be instructive in both content and methodology in addition to providing experience in curriculum development. Hopefully, the teachers attending the institute would receive renewal credit.

To re-emphasize the fact that the field testing teachers would like to see such a unit made available to schools, many of them wrote letters to the North Carolina Advancement School at the conclusion of the project. One teacher stated that the interest of her students developed tremendously and on an average their grade came up one letter. The following is a copy of a letter that exemplifies the interest in the geology unit.

Washington, N. C.
May 27, 1967

Dear Jim (Foster and Blanton)

I have found the lesson plans and materials on the Geology Unit most helpful this year.

I would like, very much, to see this unit made available to all Earth Science classes in North Carolina. If it cannot be used as the basic text, it should be made available as supplimentary materials.

Student participation definitely contributes to better learning. It is easier to hold the pupils' interest and they get a much better understanding of the concepts.

I've enjoyed working with all of you in this field testing program; my only regret is that the material was not available to me the first year I taught Earth Science. Good luck to each of you in your future work.

Sincerely,
Mrs. Hannis Latham, Jr.

Many of the teachers at the conclusion of the geology unit gave the students an opportunity to evaluate the program. It was a subjective expression of their opinion. Several copies of such evaluations follows:

Dear Mr. Foste·,

I liked this unit on geology much better than I liked the work during the fall. I liked it because we did so many interesting things. We drew lots of pictures, we made things. The best day of all that I liked was when we made fossils, that was fun. I made a fossil of a seahorse. I also liked the days when we had to color some parts of a map and paste them on. Each day when I went to class it was interesting because I learned something new. And I also think that Mrs. Latham did a very good job teaching us.

It was a fun class as well as a learning class.

Dorothy Alligood

Dear Mr. Foster,

I think that this has been a very interesting and worthwhile course. Speaking for myself I think you get more out of something when you can do the investigating and find out the answer yourself and not have it put right in a book for you. You are more aware of what you have learned. I think the part on imprint and cast fossils was the most interesting part. I liked the part on atoms least of all because it was hard to catch on but otherwise I have enjoyed it extremely.

Dear Mr. Foster,

I enjoyed some parts of this Geology Course and other parts I didn't like to well. Its the first time I've done lab work and I enjoyed it. I'll admit it was hard work but afterward you'll find its worthwhile.

I'm not too crazy about science but I think anyone can learn to enjoy it. I do.

Yours truly,

George Mitchell

Dear Mr. Foster,

I enjoy this type of teaching better than the type where you use the book. To me this meant more understanding, than using the book. Also by this type of teaching, my grades were much better than they were when we used the book. This type of teaching to me itn't as boring as using the book.

The most interesting and enjoyable part to me was the eras. I didn't like mixtures, elements, compounds and atoms as much as I did the others.

By using the digrams sent from the envancement school, also helped me to get a better understanding which stuck with me. While using the book last fall, the understanding was hard to get and hard for it to stick.

Last fall I didn't like science, but with this method of teaching has helped me to like it a little bit, but still I'am not very fond of it.

Dear Mr. Foster,

I feel that the work we have been participating in lately is more educational, understanding, and in the long run a lot more benificial.

I believe the classes of the future would enjoy this very much, although there is one thing about the course I don't like. The films! They're boring! I think they should be movies instead of slides. They should have real life!

Everthing else about the course is great, the studying is easier also. But I think you should supply special notebooks.

Geology is great! (sometimes)

The field testing experience opened up new avenues of teaching styles and this result was noted throughout the year. The fall group of teachers were applying the methodology of the unit to other areas of the text book during the year.

The field testing experience also demonstrated the flexibility of the geology unit. It was taught by first year teachers and experienced earth science teachers across the state. The teachers felt the unit was well received by students with a wide range of ability. The geology unit proved to be extremely flexible with students and teachers.

# TEACHERS AND SYSTEMS PARTICIPATING IN THE SCIENCE FIELD TESTING PROGRAM

Winston-Salem/Forsyth County--Mr. Marvin Ward, Superintendent

Kennedy Junior High School-Mr. C. J. Washington, Principal

** Mrs. Bessie Dobson
Donald Foster

Philo Junior High School-Mr. John Eberhart, Principal

Richard Smith

Wiley Junior High School-Mr. Earl Sanderfar, Principal

Jerry Lee

Hanes Junior High School-Mr. Phil Johnston, Principal

Norman March

Greensboro City Schools-Dr. J. P. Weaver, Superintendent

Kiser Junior High School-Mr. Clyde Pressley, Principal

**Gene Mauney

Proximity School-Mr. David Johnson, Principal

*Miss Mary Dugan

Central Junior High School-Mr. L. W. Anderson, Principal

Mrs. Ann Murr

Jackson Junior High School-Mr. Charles Rankin, Principal

Mrs. Linda McDougle

Gillespie Park Junior High School-Mr. William Best, Principal

Mrs. Margaret Johnson

**Charlotte/Mecklenburg County Schools-Dr. A. Craig Phillips, Superintendent**

Albemarle Road School-Mr. Jack Blackburn, Principal

*Miss Freida Morgan

Hawthorne Junior High School-Mr. Pinkney Stowe, Principal

*Mrs. Loretta Sites

McClintock Junior High School-Mr. Ralph Leete, Principal

**Mrs. Jean Whitener

Quail Hollow Junior High School-Mr. F. K. England, Principal

*Mrs. Margaret Cherry

**Durham County Schools- Mr. Charles Chewning, Superintendent**

Carrington Junior High School-Mr. C. W. Morgan, Principal

**Mrs. Minnie Ward

Southern High School-Mr. Charles Campbell, Principal

*Mrs. Katherine Helsing

Merrick-Moore High School-Mr. D. M. McCaskill, Principal

*Mrs. Celestia Sanders

Highland Junior High School-Mr. Harry Bryant, Principal

*Mrs. Dorothy Gibson

**Lenoir City Schools-Mr. J. G. Hagaman, Superintendent**

Davenport School-Mr. J. V. Mills, Principal

Mrs. Elois Harper
Mrs. Viola Lorenzo

**Asheville City Schools-Mr. W. P. Griffin, Superintendent**

David Millard Junior High School-Mr. Gilbert Lance, Principal

**Mrs. Venice Lance

Rutherford County Schools-Mr. Forrest Hunt, Superintendent

Rutherfordton Elementary School-Mr. Herman Green, Principal

Mrs. Elaine Hudson

Washington City Schools-Mr. Jack Lawrie, Superintendent

John Small School-Mr. Ronald Seifred, Principal

Mrs. Ann Chandler
**Mrs. Hannis Latham

Currituck County Schools-Mr. Franklin Pendergrass, Superintendent

Moyock School-Mr. Lane Pressley, Principal

Mrs. Faytie Cox

Craven County Schools-Mr. R. L. Pugh, Superintendent

Havelock Junior High School-Mr. A. W. Edwards, Principal

*Miss Mary Creech

Madison-Mayodan City Schools-Mr. Mayo Bundy, Superintendent

Madison-Mayodan School-Mr. Richard Collins, Principal

*Miss Sylvia Campt

Dare County Schools-Mr. Seth Henderson, Superintendent

Manteo High School-Mr. John Roberson, Principal

Fred Hunter

Person County Schools-Mr. R. B. Griffin, Superintendent

Morgan Street Elementary School-Mr. James Gray, Principal

Mrs. Anne Elam

High Point City Schools-Mr. D. B. Pruette, Superintendent

Ferndale Junior High School-Dr. Gaither Frye, Principal

Charles Guyer

Griffin Junior High School-Mr. N.S.Moorehead, Principal

Haywood Keaton

Reidsville City Schools-Mr. C. C. Lipscomb, Superintendent

Moss Street School-Mr. Edward Townes, Principal

Archie Banks

Perquimans County Schools-Mr. C. C. Walters, Superintendent

Perquimans High School-Mr. William Bynum, Principal

Mrs. Blanche Dillon

Beaufort County Schools-Mr. W. F. Veasey, Superintendent

J. A. Wilkinson School-Mr. J. L. Leary, Principal

Fred Wilson

Iredell County Schools-Mr. T. R. Gibbs, Superintendent

Central School-Mr. FlakeReid, Principal

Homer Keever

* Denotes teachers participating in the fall and spring field testing

**Denotes teachers having control and experimental classes during the spring.

# APPENDIX E

## A REPORT ON THE FIELD TESTING

## OF THE

## NORTH CAROLINA ADVANCEMENT SCHOOL COMMUNICATION UNIT

## AND ITS

## IMPLICATIONS FOR TEACHER TRAINING

# PREFACE

This writer was a member of the English Department of the North Carolina Advancement School during the two years in which a unit called Communication was developed into the motivational core around which all learning revolved. In its third year the School placed this unit in the classrooms of thirty public school teachers, thus exposing it to over 1,000 students; and this writer became the School's representative to the people participating in this project.

These teachers were asked to furnish the School with their reactions to the unit as often and regularly as they could. Many quotations in this paper are taken from what these teachers wrote and from what their students wrote in voluntary evaluation of the Communication unit.

This paper is not only an explanation of how this project was put into operation and a description of the teachers and students involved, but it also presents this frequent observer's opinion of the significance of this experiment to the progress of teacher education and re-education.

The English Department of the North Carolina Advancement School met September 29 and 30, 1966, with junior high school teachers from the North Carolina public schools and presented them with materials and a method found successful at the Advancement School in stimulating underachievers to understand and express themselves better. They were anxious to know if their Communication resource unit would be as valuable to the general school population as it had been at the Advancement School. Their contention was that a course that encouraged reluctant learners to care, not only about learning in general, but about the arts and humanities specifically, would surely have much to offer all students.

At this orientation meeting, members of the Advancement School English Department introduced the arts to the teachers as a demonstration of how they might be introduced to a class. Each member of the department met separately with two or three of the interested teachers as they previewed the material being loaned to them for experimentation. It was hoped that this personal interaction, followed by frequent visits from a representative of the department, would give meaningful support without inhibiting the teachers' creativity.

Consequently, teachers were not given lengthy detailed lesson plans. Instead, they were given seventeen lesson series, so called because each contained the raw material for an extended teaching unit if the learning situation it created warranted continuation.

The flexible format of these lesson series is one of their best aspects in that it gets the teacher as involved as the student.

Several students pointed out that there should be just as much enjoyment for the teacher also.

Jeff Saxon, Philo Jr. High, said:

> "The unit was such a one that a teacher would have just as much enjoyment teaching the unit as the students would being taught it."

Fear that any tendency toward spoon-feeding the teachers would stifle the personal creativity each could bring to the unit was the reason for rejecting the idea of an eighteenth lesson series on prejudice, a recurring, meaningful theme in many of the Communication classes at the Advancement School. This theme had always evolved spontaneously, as do most successful topics in a student-centered learning situation. So instead of giving the teachers anything in print about the topic, the Department discussed with the field testing teachers the value of their guidance, not dominance, in creating an atmosphere conducive to successful student-directed units of study, such as prejudice had been at the Advancement School.

This discussion technique proved to be a valuable means of teacher training. Several teachers reported that a study of prejudice developed in their classes. The following is an example of a student-directed unit:

PREJUDICE

A lesson series developed and written by Mrs. Geraldine Smith's seventh grade Communication class at Kennedy Junior High, Winston-Salem, N. C.

I. Objective

To show how little misunderstandings can lead to prejudice. All of these activities are an out-growth of viewing the film "White Mane," borrowed from the North Carolina Advancement School, and his conflicts with men - mean ones, selfish ones, as well as kind, loving ones.

II. Materials

A. "Coaly Bay, the Outlaw Horse," by Ernest Thompson Seton, in Scholastic Anthology Animals and in Wide, Wide Word of Literature, a state-adopted text.

B. Small World - Scholastic Literature Unit Anthology
1. "A Word of Warning"
2. "Fire"
3. Poem - "If Only I Could"
4. The Chocolate Pot

C. Film - "No Man is an Island" - public library
Follow-up story "A Question of Blood," Scope, April 1, 1966

D. "The Legend of the Black Madonna" from Scope Magazine, Dec., 1965

E. Five stories from Five Faiths from Scope Magazine, Dec., 1966

III. Discussion and Activity

A. The Problem of Justice
1. Who do you think is right in the struggle between Coaly-bay and his master? - the cost with his love for freedom or the man who strive to make him a useful member of society?

2. Discuss characteristics of both White Mane and Coaly Bay (both fighting for freedom, etc.) Which horse did you like better?

3. Give attention to human characters.

4. Consider fictional elements in a seemingly true tale.

B. Listen to Poetry

1. "Wild Stallion" - Alma Highbee (Nature Magazine, Jan., 1959)

2. "The Ballad of the White Stallion: - Beverly Lewis

C. Use Black Mane and White Mane as symbols of the two races. Can each be truly characterized from your writings?

D. What incidents in these stories can you associate with real-life situations?

1. Bring Negro to America
2. Slavery
3. Parental influences a cause of prejudice
4. K.K.K.
5. Sit ins
6. War
7. Bi-racial meetings
8. Causes for racial reactions
   a. Embarrassment
   b. lack of needs

E. Film "No Man is an Island"

1. What seems to be the true reason for their prejudices?

2. In what ways was George humiliated?

3. Do people that have things in common usually get along?

4. How appropriate is the title?

5. If you are interested in this seventeenth century poet whose poetry is quoted in the beginning and end of the film, do research on Dohn Donne.

6. Would this film have been more effective in color?

7. Can you explain the feelings it aroused in you?

8. To whom would you recommend the film? Would you limit its use in any way?

9. Did it need music?

10. Write one more scene for the conclusion of the film.

F. Black Madonna

1. Characterize the Artist

2. Why did he have such an attitude?

3. What was the congregation's attitude?

4. Who was the mediator?

5. Contrast the pastor in "No Man is an Island" with the one in "The Legend of the Black Madonna."

6. How were attitudes changed?

7. Could the church change attitudes today?

G. Five Stories from Five Faiths

1. After reading these five stories, do you see any differences in the faiths?

2. What is the one and only objective?

3. Do you think your faith is the best one? Why?

---

Also, at the E. J. Hayes School in Williamston a study of prejudice grew out of the "West Side Story" lesson series (#9) in Mrs. Gibbs' ninth grade class. For each story they read, they were able to point out the reason for the prejudice, speculate on the consequences of the prejudice, and tell how the persons involved might have overcome the prejudice. Mrs. Gibbs reports that "They even went back and related 'The Invisible Man' (#5) to the prejudice theme" as evidence of the students growth in the ability to associate ideas within their common experiences in Communication.

The seventeen sample lessons have opened so many new avenues of interest that the time spent in field testing them varied from eight weeks to the rest of the semester. Apparently the unit is interminable for the many teachers who have reported "I'll never teach any other way again."

Again and again in feedback from the field testing teachers, as well as in the personal opinion of the field testing representative, there are strong indications that the experimentation with the Communication Unit has had a positive influence on the teacher's method or style of teaching. Although the research done in the field project will measure the learning and change of attitudes in students, this paper will attempt to establish the need for research on the influence of the Communication Unit on the teaching style of those who experiment with it. If it is true that many aspects of the Communication Unit do facilitate a better learning situation, then the unit would be a valuable resource for prospective student teachers of literature, language, and the humanities, as well as for the in-service training of experienced teachers.

In the May, 1967, issue of NEA Journal, a report on the Profile of the American Public School Teacher contains a chart indicating "How Teachers Evaluate Various Fields of Their Undergraduate Preparation for Teaching." The highest percentage reported poor preparation in use of audio-visual equipment and materials (49%), which was followed closely by classroom management and discipline (39%), and teaching methods (24%).

When Communication field testing teachers were asked what was the major change in their teaching methods, almost all mentioned the use of audio-visual materials and equipment. Some had used the record player occasionally, but with the Communication Unit music became so much a part of class that these machines were used constantly. At first music

is introduced very subtly as background for the students' writing and reading, and for the non-verbal films. Soon music is a stimulus for writing, and eventually students are able to listen to music as a meaningful form of communication in itself.

The teachers found the tape recorder a stimulus for communication to those students who have difficulty with writing assignments, as well as those who need practice in oral communication. The use of more than one tape recorder greatly facilitated group work for such activities as plays. After seeing how much more convenient were the tapes made by the Advancement School English Department for keeping together many different selections of music, some teachers made their own tapes of various musical selections for their own purposes, such as the study of mood and setting in short stories. The most unique use of the tape recorder was the recording of portions of the sound-tracks of films. These were an asset to the students in discussing and writing about the films, and to the teacher in planning the introduction and follow-up to the film.

However, the use of the film itself was the biggest innovation for the teachers. It would probably come as a shock to some instructors of education and methods courses to know that teachers made such statements as "I had never used films. I find it very effective." Whatever preparation these teachers have had in the use of films has obviously been ineffective.

Those teachers who have shown films in the English classroom have only shown films that teach particular skills in grammar or those

giving information about an author. Some may even have used such films as the Encyclopaedia Britannica series on the humanities which are very expensive, illustrated lectures that are hardly suitable for average classes, much less for underachievers. The real disadvantage in the use of these films prepared by educational establishments is their accompanying guides for the teachers, complete with questions to be answered and historical data to be memorized. When a teacher's opportunity for creativity is so stifled, students can hardly begin to know the exhilaration of spontaneous discussion.

On the other hand, teachers and students who have viewed films as an art form have been learners together. One teacher wrote about what she learned by showing the classic children's film, "The Red Balloon" to her ninth grade class:

> "I had certain ideas about what the students would get from it. If discussion had been limited in time, they would have gotten what I expected of them because the questions I asked limited them to that information. However...everybody had a chance to have his say. It was amazing how many different interpretations they made of the film. So what if I didn't agree with all of them. They were just as legitimate. Perhaps the symbolism they found was ever more real than mine, as I had just seen the film with my own children, and couldn't help being influenced by their reactions."

A student writes to his teacher explaining why learning was more meaningful to him through films:

> "I enjoyed seeing the movies that we saw. Because after we saw the movie we got to tell what we got out of it instead of you standing up there and asking us questions about it. I got more out of things by being able to express my feelings."

It has not been easy for the adults who have a habit of complaining about the amount of time young people spend watching low-grade entertainment to realize that this very situation indicates the irrelevance

of English teaching. If English teachers had been tuning in to the students' visual world and helping them to develop habits of perception, interpretation and selection, there would be a greater demand for excellence within the medium. The use of films helped many teachers to realize their prejudice for the printed word, which no longer monopolizes communication. Our culture is being dominated increasingly by images, and English teachers who have not recognized this and re-oriented their teaching methods accordingly have been guilty of culturally depriving their students.

However, the National Council of Teachers of English has taken a step in the right direction in helping its "culturally deprived" teachers get reoriented through their 1965 publication Motion Pictures and the Teaching of English, which introduced the film as a means of illuminating the study of literature. The book discusses the similarities between the film and literature: theme, irony, metaphor, point of view, symbol, and flashback.

The Communication Unit suggests reading that is related to every film used, but the film has been a better stimulus for discussion and writing. Every film recommended in the Communication Unit is an entertaining and adventure capable of igniting sparks of creative expression and multi-level discussion of philosophical issues. Each student responds according to the development of his interpretive ability, but teachers found that all could contribute something because seeing a film is such a personal experience.

A teacher writes that:

> "A child who had difficulty reading could understand a film and felt he had just as much right to speak his feelings as a person who had traditionally made better grades in English than he had."

When the teachers were shown some of the films at the Communication Conference, they found them just as stimulating as their students did later. Techniques such as stopping a film at a crucial point were new and exciting to them and they were anxious to try them also. They left laden with film catalogues and enthusiasm, but most were soon to meet frustration when they tried to order films through their local school administrators. How many programs with as much potential as the Communication Unit may have died soon after conception for lack of financial and moral support! One teacher describes her feelings very movingly:

> "The films we saw were so great I could have wept for them, but weeping wouldn't get them."

Most teachers were able to use only the ten films available on free loan from the Advancement School. (See Film Reference List Addendum.)

Although all administrators involved had approved the field testing and had promised to make a few purchases, only two of the original school systems made any more than token investments. Consequently, only in these two systems has there been a concrete continuation of the approach. Some administrators say they plan to order some films for next year. Teachers say that at least some eyes and minds have been opened, if not yet pocketbooks.

The experience of the public school teachers trying the Advancement School approach to teaching through the Communication Unit have proved that the problems of classroom management and discipline diminish considerably. However, this may not occur until after the first few weeks in situations where the approach is so radical a change that the students have more difficulty adjusting to their new atmosphere of freedom-with-responsibility. But eventually students become so involved and interested in classroom activities that an element of self-discipline develops. As the learning becomes more student-centered, the students take more responsibility for the direction of the class. Problem students become student leaders. One teacher confessed her surprise at "how well behaved boys and girls are when they are engaged in doing something they enjoy." A girl unknowingly lends her support to the belief that the Communication Unit does cause behavioral change:

> "I like and enjoy the course. It seems so much easier on students and teachers. I think I have learned much from the course maybe not just the things it is supposed to teach either. I have learned to control my temper to act less tomboyish and more ladylike. You may not think this is much, but I have a violent temper and should have been a boy instead of a girl. I have learned to like writing and to try different things I hated before."

A teacher gives a specific example of a lesson series which brought about a change of behavior in students and better understanding of their behavior for the teacher.

> "I am lead to believe that our study of 'West Side Story' brought on a desirable change in attitude of two students (both members of a gang) in my class whereby I was spending more time reprimanding the students than I was teaching. Both had very negative attitudes and were always ready with a sarcastic remark to answer any statement directed toward them. It had reached the point where they were influencing some of the other students.

> 'West Side Story' and others having the prejudice theme, helped me understand them better, while it also helped them understand themselves."

For the first time many teachers learned what their students were like as people. Teacher and student got to know and understand each other's problems as human beings. The learning experience truly became humanistic. One teacher felt that "a real accomplishment of the course was to convince the students that teachers are real and have just as many problems and interests as they do."

One of the objectives stated in the philosophy of the Communication course is "to provide the substance and occasions for self-discover." As students go through this process of self-discovery and as their teachers see again and again how their classes can be relevant to the students' lives, both teacher and student experience a tremendous growth in understanding that unleashes them from the roles they had been playing. They can then enjoy the excitement and enthusiasm that each stimulates in the other as they explore life together.

Rapport between students and teachers has become difficult to establish. Probably the greatest asset of Communication is that it leads the authoritarian teacher into the genuine, personal relationship with his students that Dr. Carl Rogers spoke about at Harvard University on April 12, 1966, in a lecture entitled "The Interpersonal Relationship in the Facilitation of Learning."

> "The initiation of such learning rests not upon the teaching skills of the leader, not upon his scholarly knowledge of the field, not upon his curricular planning, not upon his use of audio-visual aids, not upon the programmed learning he utilizes, not upon his lectures and presentations, not upon an abundance of books, though each of these might at one time or another be

> utilized as an important resource. No, the facilitation of significant learning rests upon certain attitudinal qualities that exist in the personal relationship between the facilitator and the learner."

There is a great need for teachers to be able to experience the personal interaction that was such an important factor in the development of the Communication Unit at the Advancement School before they set about trying to establish such a change in their own classrooms. Although the field testing teachers are 100% in favor of the approach, they have felt their success with the unit to be limited by a brief conference. Certainly it must be frustrating to start a totally new venture without a better overall view, a longer and deeper involvement. Teachers who have field tested the program suggest that future orientation include demonstration classes. Administrators should also be involved because their support would be a great morale booster for the teachers.

Teachers did find one of their most difficult problems to be the change to a more student-centered class. A teacher writes what she did to facilitate the change:

> "We revised the seating arrangements so that at no time could I appear to really lecture. This change was perhaps one of the hardest for me, and without reason, as it turned out. I had felt that unless I rather arbitrarily made decisions for the group that the wrong decision would be made. Such was not the case."

One field testing teacher had the opportunity to spend several weeks at the Advancement School before she began the Communication Unit at her own school. This teacher took with her more than a package of materials; she took an approach to teaching which she had

seen in action. She had seen her materials serve as the vehicle for developing perceptive, tolerant, understanding young people who knew the higher cognitive skills of thinking. She had seen young men from her all-Negro school in one of the poorest counties in North Carolina take great strides toward maturity, not delinquency. She had seen teachers who evaluated their success in terms of student involvement rather than the degree of student proficiency with language. She had seen students enjoy learning!

Having seen that honest expression does emerge if the student feels secure in the knowledge that the teacher and his classmates will respect him and accept him as a person, she created an atmosphere so conducive to freedom of expression that one of her students weakest in the technical knowledge of grammar could write:

> "We could do scary thing on a cloudy day. We would put a record on about, and the girl will started screeching. The girl in front of me would started to screeching, and boy would laugh at her...The communication help me by liking me."

This young man knew he was more important to this teacher than a lesson plan. She encouraged her students to think and discover for themselves, to become more deeply involved in the whole process of learning. There is evidence in their writing that her students see the value of the approach to all learning:

> "If we had communication in our other subjects, I think we could learn our work with ease. I wish that adults and dropouts could take a communication course. I think it will help them to have a better life."

In another school across the state where students were far higher in IQ scores, achievement, and socio-economic status, their teacher underestimated the value of the relevance of the Communication Course for the young people of today. She is the oldest of the field testing teachers and has the most years of experience with traditional methods and materials. She could not wholeheartedly accept our methods and materials, but her principal had asked her to field test the unit and she was not one to question her superiors. Not even on an occasion when she became excited about a lesson and wanted to rent a suggested film would she question her principal because she knew it was not a school policy to rent films but to use those the system had purchased.

The particular film which interested her was Scott's Last Journey, recommended in lesson series #12 about documentary films on man and his environment. Like many teachers, she was enthusiastic about materials that correlated language arts and social studies because that is the aim of the block situation in which most of the field testers teach - in many cases without any help in correlating the subjects. She writes of the renewed interest in local history as a result of the film Occurrence at Owl Creek Bridge:

> "We discussed a hanging that took place in Lexington some seventy-five years ago...and landmarks like 'the hanging tree' and the old jail."

A student at another school gives examples of how communication learning carried over to social studies:

> "Communication will help us to understand better the hardship of the people of earlier days such as the films The Plantation (Occurrence at Owl Creek Bridge) and Night and Fog."

Another student tells how communication helped in all other subjects:

> "When I read a chapter in science or some other subject and have to answer questions, I don't have to read it over and look up this question and that question because when I read it the first time I got the meaning out of the chapter."

Still another student could see the value of communication because it transcends all subject matter:

> "Several other classes envied us, saying that we got out of so much work. I don't think that we really did, and sometimes had twice as much homework as before. But that doesn't really matter. The purpose, as I see it, was to convey to our minds that there are things around us besides our little cliques, school, family, etc., to use our immature (partially) minds to see the inside of something.
>
> All together, I consider the project worthwhile, naturally liking some parts better than others. If it was up to me, I would divide the unit into smaller, more detailed parts, and starting from the third grade, have a special time every day to study Communications. After all, it helps you understand things, this world could use some understanding."

The evaluations from the older teacher's students were briefer, and less specific. But there was some evidence that the shell of protection the teacher had built around their naivete had been cracked.

> "I have learned that there are a lot of people who aren't better off than me and my friends. I think this course helped me a lot to understand other people's troubles. I feel this course should be given to everybody to help them understand too. I think that's what this world needs, more understanding."
>
> "The movies we saw on people's problems were very good. They helped me to understand the causes of some people acting the way they do. It's not all their fault."
>
> "This course has opened my eyes to many different things. I like this kind of learning. I think this type of learning is better because you do not get bored with it. It's not like having piles of language homework that would take you three hours to finish. If I did have three hours of this type of learning for homework I wouldn't mind it at all."

> "I have learned how you can communicate in so many ways and that not all ways are happy. This course has given me plenty of ideas on what I would like to do when I plan my future job. I feel now that I cannot even say that I don't know how to help the public."
>
> "I feel this course has helped all of us in a great many ways. First of all it has helped open up the feelings of us young people. Probably thoughts have gone through our minds that we have never before experienced as we watched the films. This course has showed us that life is not all fun and gay and that everything does not have a fairy-tale ending."

After reading her students comments, perhaps this teacher would be more receptive to suggestions of realistic contemporary literature and films that deal with disturbing topics which teachers often prefer to ignore. A few other teachers have balked at the use of such material as the poem "The .38" from Langston Hughes, New Negro Poets, "The Dark," a radio play from a record album Drop Dead, or the film The Quiet One, a documentary of a potential delinquent from a New York slum. The more reluctant field testing teachers had been in education about twenty years. After all those years of familiarity with literature books which contain what the publishers felt represented the "best" writing, teachers are threatened by writing that has not stood the test of time. How can they put the weight of their authority behind it? They should not. But it would be better to help students analyze what they are seeing outside the classroom than to tell them what they should read and what they should think about while they are a captive audience. Such an authoritarian method just widens the gap between the generations and gives students the impression that their teachers are unable to cope with the real world of the present.

Today's students are growing up in a world significantly different from the world in which their teachers grew up. John Culkin, Director of the Center of Communications at Fordham University is prompted to make this analysis of the situation as he looks out the window and sees....

> "TV antennas. This is the first generation in history brought up on TV from infancy. It has probably learned as much from TV as from any other agency in our society. Schools plus neighborhood plus the family plus the church used to pretty much control what kids learned. That's all over now. You can't program reality for the kids the way you used to do. The mass media and the automobile have made reality nongraded. The mass media have also given the kids a wider variety of competence models. They respect relevance. Woe to the teacher who is not relevant and competent."

To be relevant and competent in this age, everyone needs a course of study which will give him the opportunity for self-discovery and self-fulfillment. If one is to accept responsibility also for the fullest development of his fellowman, and come to an understanding and appreciation for others with their different skills and problems, he needs a course of study which makes him aware of the individual and each individual's need to communicate with others, however different they may be. This is especially crucial for English teachers. Unless their training is humanistic, many opportunities to guide young students to learn to <u>think</u> about what they read and write and speak may slip by, while the teachers concentrate on just the mechanical skills of the use of language.

Progress in education is held back today by teachers who concentrated on learning the skills and facts which would earn them the position

of teaching others those same skills and facts in the same manner. Some begin to think critically and creatively, but those few have an almost insurmountable obstacle in the many others whose secure positions are threatened by new ideas. Many teachers fail to stimulate students because their training did not prepare them for the need to make learning relevant. When some students make their yearly efforts to find a teacher who will answer "What is the meaning of this? What's in it for me?" they usually find that their questions continue to go unanswered.

The teacher never thought about the many different kinds of attitudes his students might have. He never thought about the many different kinds of individual human beings who would confront him. He never thought about how many different stages of human development could be present in a classroom of students all in the same grade. He never did a lot of thinking he needed to do. Oh, he memorized some generalizations from his educational psychology book, and he practiced teaching some concepts in his methods course. That was all that was asked of him by his college professors, who never confront the problems of a public school classroom.

In his frustration the teacher hides behind textbooks and gradebooks. The students hide comic books inside the textbooks. But there is no way to hide that almighty document, the report card. That document is proof that the student failed to learn what the teacher decided he should know. He may decide to go through the procedure again, this time letting the teacher win. Or the report card may be proof to

him that there is no use spending any more time in those rigid rows of desks while freedom waits outside the classroom. With either decision, nobody wins.

What could be done to prevent this situation? If the teacher and the student could bridge the gap between their respective outlooks, the student might learn that by coping with situations and by learning to communicate in spite of obstacles, he can know a greater freedom. If a class studies something that is as new and exciting to the teacher as to the students, such as the Communication Unit, the learning situation might improve, as it has for the teachers who have used this unit. As learners together, teacher and student discover a mutual respect.

Henri said:

"FEEL THE DIGNITY OF A CHILD.
DO NOT FEEL SUPERIOR TO HIM.
FOR YOU ARE NOT."

# THE NORTH CAROLINA ADVANCEMENT SCHOOL

## FILM REFERENCE LIST

The following ten films were purchased by the North Carolina Advancement School and loaned to public school teachers who field tested the Communication Unit. Several of these school systems are purchasing as many of these as they can for their own libraries.

BOY WITH A KNIFE
24 min B&W sale $95 IFB
This old film starring Chuck Conners as a youth worker who tries to turn a destructive gang into a constructive club is a favorite with students who get a better understanding of their own problems through analysis of young people with similar but more pronounced problems.

DREAM OF THE WILD HORSES
6 min color rent $12.50 sale $75 CP
This breath-takingly beautiful film in slow motion against soft focus has no narration or dialogue but a dramatic musical soundtrack played by electric instruments. It is a cinematic poem that stimulates creative writing. Awards at festivals in Berlin, Spain, Tokyo, Mexico, Hollywood.

GREAT ADVENTURE
75 min B&W sale $200 CP ST
Noted Swedish director Arne Sucksdorff's classic study of man and nature. Beautiful photography and English narration tell the story of two Swedish farm boys who rescue and conceal an otter, but learn "No one can catch and hold a dream for long." Cannes prize.

LINES HORIZONTAL
6 min color sale $75 CP IFB
Canadian film artist Norman McLaren is noted for several extraordinary experimental shorts. Lines, ruled directly on film, move with precision and grace against a background of changing colors, in response to music specially composed by American folk musician Pete Seeger on wind and string instruments. International awards at Venice and Edinburgh. A brochure describing McLaren's techniques and listing all his films can be obtained by writing Mr. Wesley Greene, President of International Film Bureau.

OCCURRENCE AT OWL CREEK BRIDGE
27 min B&W rent 17.50 sale $200 CP
In 1962 a French short film walked away with the Grand Prix at Cannes. The audience is immediately plunged into the atmosphere of the American Civil War. Not only is it an exciting film, it centers specifically on a man whose imminent death makes the world of the senses desperately dear to him. Thus it is an ideal conclusion to the introductory lessons on the senses, raising sensory experience to the level of philosophical statement.

NANOOK OF THE NORTH
55 min B&W rent $25 sale $350 CP
Beyond its historical value as the first full-length documentary and its excellent exemplification of documentary format and techniques, it is valuable for its comments on man's relation to others and to his environment. Robert Flaherty, pioneer in the exploration of the film medium, drew the character of an Eskimo hunter so powerfully that when Nanook died of starvation two years later, the news was published around the world. The power of the motion picture as a means of directly communicating the life of one people to other people was overwhelmingly manifest.

THE QUIET ONE
67 min B&W rent $25 sale $400 BR CP
The story of one of the thousands of boys and girls who grow up in modern society without being loved or appreciated, or even wanted. The boy in this film drifts into delinquency and finally is sent to Wiltwyck School. The emotional damage has been so great, however, that he becomes one of the quiet ones who build walls of silence around themselves. How the wall is finally penetrated makes this a genuine masterpiece of documentary drama and an outstanding contribution to human understanding and the motion picture art.

THE RED BALLOON
34 min color rent $22.50 lease $375 BR
A charming fantasy about a boy and a balloon in Paris which stimulates the creativity of all ages, from interest in story-telling to a discussion of symbolism. Winner of an Academy Award as well as other international awards. With a magnificent musical score, the film has no need for dialogue.

WHITE MANE
39 min B& W rent $22.50 sale $175 CP
Also directed by Albert Lamorisse (THE RED BALLOON) and also winner of international awards, this simple story of a young boy's friendship with a proud, wild stallion and how they resist the adults who want to capture the horse brings themes on innocence and experience, tenderness and power, trust and betrayal, hope and disillusionment, very close to the lives of the students who can gain from this film perspective on films which do not raise issues of comparable significance. The contrast between "White Mane" and most cowboy movies is striking.

NIGHT AND FOG .
31 min color with B&W rent $30 sale $250 CP
The excitement in the international film world upon the release of this multiple prize winner closely paralleled the sensation caused by the same director's first feature, HIROSHIMA, MON AMOUR. For a generation which loves horror stories but is too young to know the meaning of the swastika which so often decorates its notebooks, this vivid portrayal of the horror of the Nazi concentration camps evokes reflection too on the daily outrages we all commit. The film is also a remarkable technical achievement with almost constant counterpoint: between music and voice (French narration, English subtitles) and between the actual black and white photographs from the past and the moving color shots of the sites today.

FILM COMPANIES

CP Contemporary Films
267 W. 25th Street
New York, New York 10001

BR Brandon Films, Inc.
200 West 57th Street
New York, New York 10019

IFB International Film Bureau
332 S. Michigan Avenue
Chicago, Illinois 60604

ST Sterling Educational Films
241 E. 34th Street
New York 16, New York

# APPENDIX F

## LEARNING INSTITUTE OF NORTH CAROLINA
## OPERATING STATEMENT--FIELD TESTING
## June 30, 1967

| | CURRRENT MONTH | YEAR TO DATE |
|---|---|---|
| Grant Received | | $ 85,000.00 |
| EXPENDITURES: | | |
| Salaries & Fees | | |
| Staff | $ 4,402.81 | $ 25,519.51 |
| Switchboard Operator | 61.40 | 61.40 |
| Consultant | 1,001.44 | 2,706.44 |
| Substitute Teachers | - | 30.00 |
| Fringe Benefits | 197.49 | 1,026.23 |
| TOTAL | $ 5,663.14 | $ 29,343.58 |
| Travel & Transportation: | | |
| Staff | $ 209.60 | $ 1,695.83 |
| Consultant | 159.44 | 2,644.14 |
| Auto Gas & Oil | 327.06 | 1,222.13 |
| Auto Ins. | - | 339.17 |
| Auto Repair & Maint. | 17.30 | 105.23 |
| Auto License | - | 33.00 |
| Travel Accident Ins. | 6.33 | 81.47 |
| Auto Leasing | - | 42.64 |
| TOTAL | $ 719.73 | $ 6,163.61 |
| Office Expense: | | |
| Telephone | $ - | $ 11.72 |
| Supplies & Stationery | - | 311.11 |
| Dues, Subscriptions & Books | - | 59.16 |
| Minor Equipment | - | 181.44 |
| Equip., Rental & Misc. | - | 5.25 |
| TOTAL | $ - | $ 568.68 |
| General Expense: | | |
| Publicity | $ - | $ 598.43 |
| Conference Expense | 50.34 | 1,999.19 |
| Project Development Exp. | - | 122.00 |
| Instructional Equip. | 1,231.97 | 5,246.71 |
| TOTAL | $ 1,282.31 | $ 7,966.33 |

OPERATING STATEMENT--FIELD TESTING (con't.)

| | CURRENT MONTH | YEAR TO DATE |
|---|---|---|
| alance brought forward | $ 7,665.18 | $ 44,042.20 |
| Capital Outlay: | | |
| Office Machines & Equip. | $ - | $ 438.21 |
| Maintenance of Equip. | - | 4.20 |
| Auto & Equip. | - | 9,002.60 |
| TOTAL | $ - | $ 9,445.01 |
| OTAL EXPENDITURES | $ 7,665.18 | $ 53,487.21 |
| STIMATED UNEXPENDED BALANCE WHEN BOOKS ARE CLOSED | | *$ 12,000.00 |

NOTE: Carnegie Corporation has given LINC permission to apply this unexpended balance to a pilot effort of a new LINC field project.