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A COMPARISON OF LOW LEVEL READERS' SUCCESS
IN TAKING ORAL TESTS VERSUS PRINTED TESTS
IN THE LEVEL ONE INTERMEDIATE SCIENCE
CURRICULUM STUDY CLASSROOM

by

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B. A., Kansas State University, 1971

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

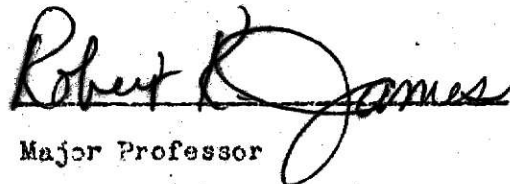
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Chapter 1

INTRODUCTION TO THE PROBLEM

Many subject oriented classroom teachers evaluate students by using printed or written tests. Traditionally their means of educating children has been by the printed page. It is assumed that all children read at a level allowing them to read and comprehend subject matter. In turn, a printed test to evaluate student progress seems logical. However, low level readers seem to be the group of students who are discriminated against the most by printed tests. A method to reduce bias in printed testing procedures, is to use oral tests in conjunction with low level readers.

The primary purpose of this study is to determine whether low level readers will be more successful in taking an oral test than a traditional printed test. Another purpose is to gain insight into the limitations of printed tests for low level readers.

The study took place in the Level 1 Intermediate Science Curriculum Study (ISCS) classes at Abilene Junior High School in Abilene, Kansas. It should be noted that the problem of the study is not necessarily unique to an ISCS program or to Abilene Junior High School. The primary difference between the ISCS program and a more conventional approach is it allows each student to progress at his own pace, and it permits the scope and sequence of instruction to vary with the students' interests, abilities and background.¹

In addition to the basic ISCS text, all students follow "excursion" activities. These "excursion" activities not only give the more capable student additional challenging activities, but also give the less able student additional remedial activities. This enables students to work at their own rate within the same classroom. Even though ISCS is a versatile program, it basically relies upon student reading and comprehension of the text and published printed tests for student evaluation.

The Level I ISCS program is centered around specific science processes as well as particular scientific concepts. The basic conceptual theme is "Energy, Its Forms and Characteristics." Likewise the basic process theme is "Measurement and Operational Definitions."²

Statement of the Problem and Hypothesis

The problem of this study, stated in the form of a question is:

Are low level readers in Level I ISCS more successful in taking oral or printed tests. It is hypothesized that low level readers in Level I ISCS will be more successful in taking oral tests rather than printed tests.

Definitions

(1). Low level readers--In this study, low level readers are those students who have a reading level below the seventh grade as determined by the Metropolitan Achievement Tests.

(2). Oral tests--Oral tests are all items of the published ISCS tests on cassette tape. These oral tests are the same as the printed ones except that they will be administered by tape recording.

(3). Printed tests--Printed tests are all items of the published ISCS test.

(4). Student success in taking oral tests--Student success in taking oral tests are the number of correct responses on the test.

(5). Student success in taking printed tests--Student success in taking printed tests are the number of correct responses on the test.

Limitations of the Study

This study may not be representative of all ISCS Level I classroom situations. It was conducted only at Abilene Junior High School. Subjects were entirely Abilene Junior High students. The author recognizes the possibility that Abilene Junior High students are not representative of students elsewhere.

Another limiting factor is that the researcher was the only ISCS teacher throughout the study.

An additional limiting factor is that not all chapters of the Level I ISCS text were considered in this study. It may be, that the chapters not tested are significantly different from the ones tested; thus results from this study may not be applicable to them.

Chapter 2

REVIEW OF THE LITERATURE

It is not the intent of the investigator to analyze the wide spectrum of reading difficulties Junior High students have. However, reading difficulties do exist in varying degrees and stem from a variety of causes.³

Townsend, in two separate studies, involving elementary and high school students, was able to show a positive correlation between reading ability and scholastic achievement.^{4,5} In a related study, Krathshol showed poor readers did unsatisfactory work in their college courses.⁶ Although the two literature citations above involve students with a wide range of ages, it appears that poor readers at any age perform less well in their scholastic pursuits than do good readers.

The majority of science courses depend on written material to teach science. A basic assumption is made that written materials are suitable for the reading levels of all students. This assumption tends to disagree with research done in this area by other investigators. Several studies outside the area of science have shown textbooks are one reading level too high for the grade use they are designated. In a study reported by Cates, Mallinson investigated the reading level of twelve series of science textbooks designated seventh, eighth and ninth. He used the Flesh formula to determine the reading level of the texts. Mallinson concluded all but the better readers would have difficulty in using the texts.⁷

Several investigators have recognized the dilemma low level readers face--comprehension of written material. Rubon compared the

knowledge gained by students who listened to a phonograph record and students who studied the printed form. The results showed no significant difference between the two methods of presentation.⁸ Postlethwait used audio tape supplemented instruction in botany. No statistical data was taken to support his work; however, he is convinced that audio-programmed lessons are beneficial to the improvement of instruction.⁹ A significant study performed by Gates compared an audio tape method of instruction with the traditional text reading method in ISCS Level I classrooms.¹⁰ No significant difference was detected between the two methods of instruction. Gates recommended several other areas of consideration with reference to his work. One being, the problem considered within this paper.

Though limited in quantity the following literature citations attempt to deal with the problem of oral tests. Many science teachers, as well as teachers of other subject matter have doubts about what their printed tests are measuring. These doubts stem from whether the printed test measures subject matter content or ability to read.¹¹ These doubts have led to concern and several researchers have attempted to approach testing in different manners.^{12,13,14} Such things as oral testing, use of pictures for test questions and responses, and teacher's oral reading of test questions and responses while students follow their test papers have been tried with limited success.

Oral testing is not new and has been used in many classrooms, especially in the foreign languages.¹⁵ Likewise in mathematics and science classrooms, oral testing which has been administered carefully and systematically has been used successfully.^{16,17}

Finkelstein and Hammill¹⁸ attempt to compare the results of two tests of science achievement: a traditional printed test and an equivalent reading-free test. Their concern was whether or not the conventional test penalized the poor reader, that is whether the traditional test tested for the students' reading achievement, rather than his science achievement. If so, how adequate and how valid are traditional measures of achievement when used with pupils who are known to be poor readers?

Conclusions from Finkelstein and Hammill's study were that: reading ability did not influence performance in science when achievement was measured by the reading-free test, reading ability and performance on the traditional tests are closely related, and poor readers did much better on the reading-free test than on the traditional printed test.¹⁹

It is important to remember that this study was performed using fifth grade students. However, the study is significant in that it shows that caution must be used in interpreting test scores that are derived from traditionally printed measures of evaluation.

The literature cited above provides important insights into this study's problem of whether low level readers in Level I ISCS will be more successful in taking oral or printed tests.

Chapter 3

METHODS AND PROCEDURES

Sample

Abilene, Kansas is a small community (approximately 8800 population) which depends upon farming and farm products for most business. Abilene might be typified as being a "middle class" community with "middle class" attitudes and values with few minority groups.

All students in Abilene Junior High School were randomly assigned to the four seventh grade Level I ISCS science classes. In this particular study two sections--class periods two and three--were selected at random by the flipping of a coin to make up the control group. Likewise, two sections--class periods five and six--were selected at random to make up the experimental group. The number of students reading below the seventh grade level is presented in Table I. These students are designated "low level" readers in this study.

Table I

Schedule of Low Level Readers

Level I ISCS

Abilene Junior High

Class Period	Low Level Readers
2.	8
3.	11
5.	12
6.	7

The enrollment of each section consisted of approximately thirty-two individuals. Although this study is concerned with only low level readers, all students in each section, whether it be experimental or control, received the same treatment. The reason for this was the experimenter did not want the low level readers to realize they were the only ones tested, thus biasing the data and perhaps embarrassing the students.

Procedure

Not all students in the study were low level readers. In order to avoid experimental bias all students in the experimental group took oral tests and all students in the control group took printed tests. Only the test results for low level readers in both groups were analyzed.

It was anticipated that the reading levels of the ISCS text and the ISCS published tests may not have been at the seventh grade reading level. The researcher applied the Fry²⁰ method for estimating readability, Unit I (Chapter I and II) and Unit II (Chapters III, IV, and V) of the ISCS text were both found to be within the seventh grade reading level. Likewise, the same method was used to determine the reading level of the published ISCS Unit I and Unit II tests. Again the reading level was found to be within the seventh grade reading level.

When students were ready for the test they informed the instructor and it was administered individually. Students in the experimental group received the published ISCS test recorded on a cassette tape for each unit. The student was permitted to stop the tape, listen and relisten to any of the questions and responses they wanted repeated. It should be noted, there was no reading involved on the oral tests. The

control group received the same published ISCS test in printed form. The printed test required subject reading for the test.

All students, whether in the control group of the experimental group, marked a numbered answer sheet to facilitate statistical analysis of the data.

This type of testing situation was in effect for Unit I and Unit II of Level I ISCS for the 73-74 school year. The control and experimental group remained the same for the entire study except for the illnesses of two students--one participating in control group Unit I and one participating in experimental group Unit I. The experimenter withdrew these two students from the analysis of the Unit I study, but they were reinstated within the analysis of the Unit II study. After all students participating as subjects in the control group and experimental group had completed the units, data from the low level readers was analyzed.

Design

The design used in this study was a modification of the Posttest-only control group design. Subjects were randomly assigned to sections. Because subjects were to remain in their assigned sections, entire sections were randomly assigned to experimental conditions rather than subjects themselves being assigned to experimental conditions. This was the only modification that was necessary to make in the Posttest-only control group design.

In order to analyze the data of this study, the null form of the hypothesis was tested:

Low level readers in Level I ISCS will be no more successful in taking either the oral or printed test.

The statistic used in analyzing the mean of the control group in comparison to the experimental group was the single tailed t-test for two independent samples. The formula used in calculating the "t" as presented by Rosco is:

$$S_{m_1 - m_2} = \sqrt{\frac{SS_1 + SS_2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)} \quad 21$$

Chapter 4

ANALYSIS OF THE DATA

The data for Unit I is presented in Table II. It is shown to be significant at a .1 level. The investigator, previous to the study had not set a level of significance by which to reject the null hypothesis. It was the decision of the investigator to report the highest level of significance allowable by the data.

Table II

"t" Test for

Unit I ISCS Oral vs. Printed Test

	Experimental (Tape)	Control (Non Tape)
Number of Students	18	18
Mean	18.55	17.28

(single tailed test)

t - 1.39

df - 34

Decision: Reject null hypothesis at @ .1 level of significance. At @ .10 level of significance, low level readers are more successful in taking oral than they are printed tests.

Although the null hypothesis may be rejected at a .1 level of significance the reader should accept the data cautiously.

The data for Unit II is presented in Table III. It is shown to be significant at a .025 level.

Table III

"t" Test for

Unit II ISCS Oral vs. Printed Test

	Experimental (Tape)	Control (Non Tape)
Number of Students	19	19
Mean	33.70	29.70

(single tailed test)

t - 2.36

df - 36

Decision: Reject null hypothesis at a .025 level of significance. At a .025 level of significance, low level readers are more successful in taking oral than they are printed tests.

The null hypothesis may be rejected at a .025 level. One should note that the level at which the hypothesis may be rejected is lower for Unit II as compared with Unit I.

An explanation as to why Unit I had a somewhat high level of significance and Unit II had a lower level of significance, is that students of the experimental group seemed to be more confident of themselves in taking the Unit II oral test than they were on the Unit I oral test. This confidence may have stemmed from student familiarization

of the cassette tape recorders and the "new" method of test administration which occurred during the oral Unit 1 test. One might surmise that in future investigations involving this paper's problem that students should be allowed to practice before submitting them to actual experimentation.

Chapter 5

CONCLUSIONS

Results of Unit I show the null hypothesis being rejected at a .1 level of significance. One should be cautioned before accepting this data because of the relatively high level of significance at which the null hypothesis was rejected.

Results of Unit II show the null hypothesis being rejected at a .025 level of significance. One should note the null hypothesis for Unit II is at a much lower level of significance than for Unit I.

A basic assumption throughout this study was that low level readers have difficulty in taking printed tests. Results of this study are consistent with results of other studies, such as that of Finkelstein and Hammill, signifying this assumption to be true. It would appear when low level readers can hear the test questions they are able to achieve higher test scores than they are on printed tests.

It seems valid that science teachers should strive to measure achievement rather than reading ability. Too often teachers assume that students' reading abilities are sufficient to deal with printed material in course work. For this reason educators should help promote success for low level readers rather than promote failure for low level readers by improper testing.

Areas for Further Investigation

It is this investigator's opinion that the ISCS classroom is a unique and dynamic situation for young science students. In order for the ISCS program to continue to improve, research and experimentation

should continue. Areas for further investigation as recommended by this investigator are:

- (1). Comparison of knowledge gained by low level readers using oral tapes of text material and film strips of text material to supplement text material and those which do not use supplemental materials, in the ISCS classroom.
- (2). Comparisons of knowledge gained by students between ISCS classrooms that facilitate the use of partnerships for accomplishing the work and classrooms that require individual work only.
- (3). Comparisons of knowledge gained by students that are placed in a classroom with adult assistants in addition to the ISCS teacher as to those who are placed in a ISCS teacher only classroom.
- (4). Comparison of the knowledge gained by non-low level readers by the oral testing approach versus the printed testing approach in ISCS classrooms.

LIST OF FOOTNOTES

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3. Marion Monroe and Bertie Backus, Remedial Reading: A Monograph in Character Education (Cambridge, Massachusetts: Houghton-Mifflin Co., 1947), pp. 1-34.
4. Agatha Townsend, "Reading and Achievement Test Scores in the Elementary Grades," from "1946 Achievement Testing Progress in Independent Schools and Supplementary Studies," Educational Records Bulletin, (New York: Educational Records Bureau, number 45, June 1946), pp. 54-58.
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6. William C. Krathwohl, "The Importance of Acquiring Reading Skills," The National Elementary Principal, (number 25, February 1946), pp. 30-33.
7. Richard Wade Gates, "An Analysis of Student Outcomes Using Audio-Tapes to Supplement Reading In The Level One Course of The Intermediate Science Curriculum Study," (unpublished Doctor's dissertation, University of Iowa, 1970), p. 3.
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12. H. D. Carter, "How Reliable Are Good Oral Examinations," California Journal of Educational Research, (number 13, September 1962), pp. 147-153.
13. Eleanor M. Ladd, "More Than Scores from Tests," Reading Teacher, (number 24, January 1971), pp. 305-311.
14. H. Wolf, "Oral Testing," Mathematics Teacher, (number 52, May 1959), pp. 384-387.
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20. Edward Fry, "A Reading Formula That Saves Time," Journal of Reading, (April 1968), pp. 514-577.
21. John T. Rosco, Fundamental Research Statistics For The Behavioral Science, Holt, Rinehart, and Winston, Inc., 1969, pp. 166-167.

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APPENDIX

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

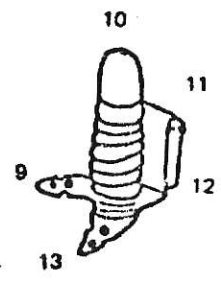
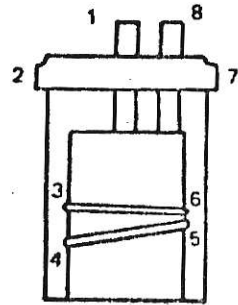
**THIS IS AS RECEIVED
FROM THE
CUSTOMER.**

Get two test leads, a bulb and socket, and an ISCS battery from your teacher. Charge the battery for one minute. Get your teacher to watch you. Now connect the bulb to the battery so that the bulb lights.

01-Core-

Study the diagram to see how you should connect test leads to make the bulb light. Then, write the two numbers for each test lead that show where the ends of each lead should be connected.

01-Core-



Something that changes in an activity or experiment and affects the results of it is called

01-Core-

- a. an example.
- b. a solution.
- c. a problem.
- d. a variable.

In box 01-Core-4A you will find a circuit all set up. Use the good spare parts in the box to find out why the bulb doesn't light. Which part is bad?

01-Core-4

Get batteries A, C, and D from box 01-Core-5. Use any other materials you think you need. Which of the batteries has influence?

01-Core-5

A hammer is used to transfer influence to a nail. Why must you swing a hammer before it can drive a nail into wood?

01-Core-6

Match the following terms by first listing the numbers (1, 2, and 3) on your paper and then writing after each number the letter (a, b, c, or d) of the correct matching definition.

01-Core-7

Terms

- 1. Component
- 2. Subsystem
- 3. System

Definitions

- a. A group of objects that directly interact with each other within a system.
- b. A group of objects that interact with each other
- c. An object that does not interact with other objects
- d. An object that is part of a system

01-Core-8A

On your paper, write the letter of each diagram which identifies a system. Also explain why the diagram or diagrams you chose represent systems.

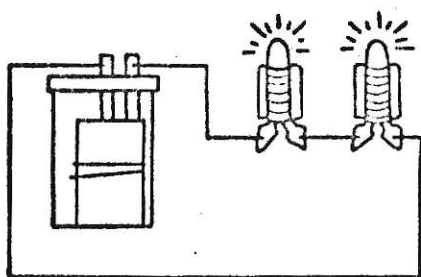


Diagram a

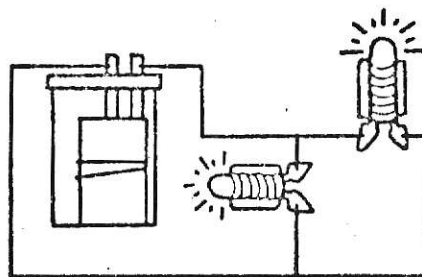


Diagram b

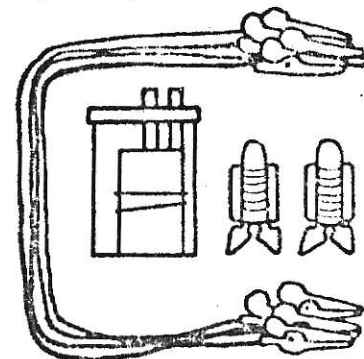


Diagram c

01-Core-9A

A

C

E

D

B

F

On the diagram above, measure the distance between the following points to the nearest 0.1 cm.

1. What is the distance from point A to point B?
2. What is the distance from point C to point F?
3. What is the distance from point D to point E?

01-Core-10A

Ask your teacher or his assistant to begin tapping on the desk for you. Tell him when to begin. Use your ISCS timer to find out how long he taps the desk.

01-Core-11A

On your paper write the letters of all good reasons for using data tables.

- a. Data tables store data in an organized way.
- b. Data tables tend to reduce errors by organizing data.
- c. Data tables make it easier to find relationships.
- d. Data tables help make sure you collect the data you need.
- e. All of these.