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A STUDY OF THE RELATIVE VALUE
OF READING MATERIALS AND VISUAL
AIDS IN FIVE CLASSES OF ENGLISH
LITERATURE

Thesis for the Degree of M. A.
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THESIS

A STUDY OF THE RELATIVE VALUE
OF READING MATERIALS AND VISUAL AIDS
IN FIVE CLASSES OF ENGLISH LITERATURE

by

Mildred Mary Tenhaaf

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CHAPTER I

**A CONSIDERATION OF VISUAL AIDS AND READING MATERIALS
AS STUDY HELPS IN HIGH SCHOOL ENGLISH**

CHAPTER I

A CONSIDERATION OF VISUAL AIDS AND READING MATERIALS AS STUDY HELPS IN HIGH SCHOOL ENGLISH

Purpose of the study. The purpose of this thesis is to study the relative value of reading materials and visual aids for use as supplementary study helps in English literature at the senior high school level. In considering the merits of these two study aids the writer has no personal preference regarding the outcome of the experiment other than a sincere desire to discover which method is the more effective one to use in high school study groups. Whether pupils in secondary schools learn more from the study of pictorial materials or whether they have reached a stage where they learn more from abstract reading materials is a matter, the writer believes, not for conjecture but for experiment. This investigation attempts to discover the relative value of these two kinds of materials in five classes in high school English.

Origin of the problem. For several years the writer has been collecting various kinds of illustrative and graphic materials and using them to emphasize important points in teaching or, in some cases, to supplement the textbook. On many occasions pupils have expressed their enjoyment of these materials or have remarked about remembering some fact because of having seen the pictures. On the other hand, the writer has also collected and used various kinds of reading materials relating to the literature which the class was reading or the author under consideration. Like the illustrations these printed articles, stories, and

accounts seemed to add both interest and clearness to the work of the class. Some pupils who were reluctant to read an article would study the pictures with enthusiasm. The evidence of a greater interest on the part of some pupils for pictures and on the part of others for reading materials led the writer to try to measure the relative value of these two kinds of study helps. Furthermore, the recent work by Hoban,¹ which suggests that in their study children pass through "progressive stages of development from the concrete to the abstract," was an added incentive to test the value of these study helps for high school pupils.

History of the problem. The recognition of the value of pictures in the schoolroom, of course, is not new. For generations teachers have used illustrations, maps, diagrams, and charts either to stimulate interest or to present new ideas. Schoolbooks, also, from the New England Primer to the most modern texts, have included graphic materials in their pages. In recent years, particularly since motion pictures have become increasingly available for classroom use, there has been a revival of interest in visual education. To just what extent pictures have helped pupils to understand or to remember facts has been left for modern scientific methods to measure.

Delimitation of the study. The present study is concerned with an experiment conducted during the second semester of the year 1938-1939 at Creston High School in Grand Rapids. This school is a fairly representative city high school with a course of study about as diversified as is usually found in a school of seventeen hundred pupils. The fami-

¹Charles F. Hoban; Charles F. Hoban, Jr.; and Samuel B. Zisman, Visualizing the Curriculum. New York: The Cordon Company. 1937. Pp. 300.

lies represented are, to a large extent, rather conservative and industrious. Five classes in English literature--that is, all the 11-A pupils in the building--were included in this experiment. The course of study for these classes required a survey of only that part of English literature from the age of Milton to the present time. The writer attempted to study the relative value of reading materials and visual aids for use as supplementary study helps in senior high school and did not include the use of visual aids as a teaching device in presenting work to the classes.

Definition of terms. For the purpose of this study reading materials are understood to include library books, reference books, pamphlets, clippings from magazines and newspapers--in short, any writings by the authors themselves or critical comments about their lives or their writings. By visual aids is meant any kind of illustration except motion pictures--that is, models, objects, slides, stereographs, charts, graphs, posters, diagrams, drawings, cartoons, comic strips, and blackboard sketches.

There are three reasons for excluding motion pictures from this study. First, a number of experiments, including that of Freeman,² have already been tried out in that field. Secondly, of all the films dealing with various subjects there are comparatively few good ones available to the average classroom teacher of English literature. Thirdly, the writer believes the illustrations listed above make up a valuable but often neglected source of information for pupils. Thus it

²Frank N. Freeman, Visual Education. Chicago: The University of Chicago Press. 1924. Pp. 322.

seemed both practical and desirable to include only the illustrative materials mentioned above.

Hypotheses assumed. In connection with this experiment the writer assumed the following hypotheses: first, that there would be a difference in the results obtained from the two proposed methods of study; and second, that this difference would be measurable. A third assumption was that the results would be expressed, at least to some extent, in information gained by the pupils.

Problems presented. In trying to discover whether reading materials or visual aids were more effective as study helps, the writer encountered several problems. The most important of these was to set up a situation which would maintain as nearly as possible the same conditions in all classes. Ability and age of the pupils, size of groups, study conditions, length of study period, procedure during the recitation period--all had to be considered. The object was to do away with all but one variable; namely, the kind of materials used during the study period. A minor problem growing out of the principal one was to find a valid test which would measure adequately the information gained by the pupils. Still another problem was to interpret intelligently the data secured from testing.

Justification of the experiment. The writer admits that this experiment carried on in a normal schoolroom does not have the scientific accuracy that could be obtained in a laboratory. Consequently no claims are made for it as a contribution to education. It is thought, however, that as a test of what can be done in an average classroom the work has been valuable. Furthermore, some of the findings which were

incidental to the main experiment seem to follow trends discovered by educational workers and so to substantiate them.

Weaknesses in the experiment. In spite of a careful attempt to match pupils with respect to ability, age, and honor-point rating, the writer found that such factors as health, extracurricular activities, and personality traits made exact matching impossible. Moreover, conditions in the classroom could not be maintained constant throughout the entire day because of minor interruptions and differences in student response at different times of the day. Then, too, although the tests used to measure the gains made by the classes were fairly valid, nevertheless they did not measure the broader objectives of the course. They also failed to measure enjoyment, appreciation, and interest except as these were shown in the number of facts the pupils acquired.

Review of literature in the field. So far as the writer has been able to learn, no study of exactly this nature has been made--certainly none in Grand Rapids. Freeman³ used motion pictures and other visual aids to supplement teaching, not study. Hoban⁴ also reported the use of pictures as an aid to teaching but did not mention any experiment dealing with study methods. At the junior high school level an experiment dealing only with motion pictures was performed by Dalrymple.⁵

³Frank N. Freeman, Visual Education. Chicago: The University of Chicago Press. 1924. Pp. 322.

⁴Charles F. Hoban; Charles F. Hoban, Jr.; and Samuel B. Zisman, Visualizing the Curriculum. New York: The Cordon Company. 1937. Pp. 300.

⁵Carl W. Dalrymple, "The Effectiveness of Motion Pictures in the Teaching of Literature." Unpublished Master's thesis, Department of Education, Michigan State College, 1935. Pp. 51.

This experiment dealt with a few single classics and did not include an entire semester's work as the present study did. Even though a study similar to the present one may have been made, there seem to be no data available.

CHAPTER II

A DISCUSSION OF THE EXPERIMENTAL TECHNIQUES USED IN TESTING THE EFFECTIVENESS OF VISUAL AIDS AND READING MATERIALS

CHAPTER II

A DISCUSSION OF THE EXPERIMENTAL TECHNIQUES USED IN TESTING THE EFFECTIVENESS OF VISUAL AIDS AND READING MATERIALS

Method used. For several reasons the experimental method was selected as the one best suited to the present study. First, the experimental method attempts to control all but one variable. The writer was able to do this (1) by equating the classes with respect to ability, (2) by having all the instruction carried on by one teacher, (3) by using the same procedure in all classes during the recitation, and (4) by using the same textbooks and tests for all pupils. It was intended that the only variable should be the kind of study helps provided.

Secondly, the experimental method employs objective tests for measuring results and statistical treatment of the findings. Scientific procedure of this sort attempts to eliminate any chance for a subjective or biased interpretation of outcomes.

Thirdly, the experimental method requires a definite technique in dealing with the groups selected. The matched group technique lends itself very well to this experiment, one group using reading materials, another group using pictures, and the control group using no study helps. Altogether, the experimental method seems entirely adequate for this experiment.

Arrangement of groups. The first step in carrying out the experiment was to arrange the five 11-A English classes in three groups,

the two morning classes, designated A and B, using reading materials; the two afternoon classes, M and N, using visual aids; and the noon class, X, using no supplementary materials. Inasmuch as there was no time between the two afternoon classes to gather materials and store them away, it was thought most practical to use the one kind of study helps during the afternoon and the other kind during the morning.

This arrangement had at least two advantages. (1) It facilitated the handling and storing of equipment such as lantern, screen, slides, stereoscopes, boxes of pictures, scrap-books, and chests of library books. Because these materials were in use at the end of the period, the time for studying them would have been shortened considerably if the room had had to be cleared and other materials brought out.

(2) Then, too, the writer wished to confine the use of the study helps only to the classes for which they were intended in order to make whatever effect they might have on the number of facts the pupils learned as great as possible. If pupils from the other three classes had caught sight of the pictures, they would probably have wanted to use them.

In putting both classes using visual aids in the afternoon and both classes using reading materials in the morning the writer did not overlook the element of fatigue which might affect the afternoon classes. Freeman⁶ believes, however, that this effect is much smaller than was formerly supposed. In reporting several experiments he notes a decrease in accuracy of less than five percent from morning till late afternoon

⁶Frank N. Freeman, How Children Learn.
Boston: Houghton Mifflin Company.
1917. Pp. 322.

and an increase of five percent in amount of work done.

In the present experiment classes were kept as nearly equal in size as seemed compatible with the varied programs of the pupils. In all a hundred sixty-one pupils were included in the experiment. This was all the 11-A pupils in the building.

Intelligence test used. The second step in carrying out the experiment was to find the mental ability of the pupils in order to consider this factor in equating the classes. Because the records of I.Q. tests for these pupils were incomplete or of too remote a date to be suitable for use, the writer furnished Otis Group Intelligence Tests in order to secure comparable data for all pupils. The Otis test was selected because it is standardized, valid, reliable, and satisfactory to administer and score. Paterson⁷ rates the Otis test as follows:

The reliability is reported to be + .92 for grades seven to twelve...The evidence indicates that this test is as valid as, if not more valid than, most of the standard group intelligence tests at the high school level.

Honor-point rating. The third step in carrying out the experiment was to find the honor-point rating of the pupils in order to match them as nearly as possible with respect to past achievement in high school. On this subject Lee⁸ says,

Teachers' marks...have about the same predictive value as have intelligence tests and standardized achievement tests. A combination of the teachers' reactions, either in the form of marks or ratings, and the test scores, either intelligence

⁷Donald G. Paterson; Gwendolen G. Schneider; and Edmund G. Williamson, Student Guidance Techniques. New York: McGraw-Hill Book Company. 1938. Pp. 316.

⁸J. Murray Lee, A Guide to Measurement in Secondary Schools. New York: D. Appleton-Century Company. 1936. Pp. 514.

or achievement, will give a satisfactory prediction of success.

Final marks for grades 10-B to 11-B inclusive in all subjects except physical training and music were considered. It was thought best not to include ninth grade marks inasmuch as a sixth of the pupils enter Creston High School at the beginning of the tenth grade from country or parochial schools where standards of marking differ from those used in Creston High School.

Equating of classes. The five classes were found to be very similar in ability and differed in mean I.Q. only 2.8 points at most and in honor-point rating only .24 points. A closer matching was attempted,

TABLE I

MEAN CHRONOLOGICAL AGE, I.Q., AND HONOR-POINT RATING OF CLASSES
IN ENGLISH LITERATURE IN CONTROL GROUP, GROUP USING
VISUAL AIDS, AND GROUP USING READING MATERIALS

Class	Group	N.	Mean Age	Mean I.Q.	H.P.R.
A	Reading	31	17.1	102.8	2.21
B	Materials	36	16.3	104.8	2.45
M	Visual	35	16.4	104.4	2.22
N	Aids	32	17.0	102.0	2.39
X	Control Group	27	16.8	103.4	2.39

however, by equating the classes. This was done by considering for statistical purposes only those pupils whose scores would make the class means as nearly identical as possible. Every effort was made to match the classes with regard to intelligence, general knowledge of literature, amount of extracurricular work being done, number of

subjects carried, sex,* and previous school record. A group of this size was found to be so small, however, that a consideration of all these factors seemed impracticable; consequently, only intelligence quotient and honor-point rating were used as a basis for matching, and the other qualities were considered whenever possible. By leaving out of the group using reading materials two pupils from class A and six from class B; from the group using visual aids, six pupils from class M and three from class N; and from the control group, X, two pupils, it was found that the greatest difference in mean I.Q. for the equated classes was .7 points and in honor-point rating, .31 points.

TABLE II

SOME FACTORS CONSIDERED IN EQUATING CLASSES IN ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS, AND
GROUP USING READING MATERIALS

Class	Group	N.	Mean-Age	Mean I.Q.	H.P.R.
A	Reading Materials	29	16.9	103.4	2.25
B		30	16.9	103.5	2.25
M	Visual Aids	29	16.4	103.7	2.25
N		29	17.1	103.0	2.25
X	Control Group	25	16.8	103.2	2.29

Matching of pairs of pupils. A still greater refinement of measurement was attempted by matching pairs of pupils. In no case was the difference in I.Q. allowed to exceed 3 points nor the difference in

*See page 57 for a comparison of gains made by boys and girls.

TABLE III

FACTORS USED AS A BASIS FOR MATCHING PAIRS OF PUPILS FROM FIVE CLASSES

Class	Group	N.	Mean I.Q.	H.P.R.
A	Reading materials	10	103.0	2.26
B	Reading materials	10	103.0	2.29
A	Reading materials	15	103.2	2.02
M	Visual aids	15	103.2	1.97
A	Reading materials	16	100.2	1.99
N	Visual aids	16	100.6	2.02
A	Reading materials	11	102.9	2.27
X	Control group	11	103.4	2.28
B	Reading materials	18	105.6	2.34
M	Visual aids	18	106.4	2.31
B	Reading materials	16	105.3	2.71
N	Visual aids	16	105.7	2.69
B	Reading materials	15	106.6	2.10
X	Control group	15	105.5	2.56
M	Visual aids	9	101.4	2.03
N	Visual aids	9	100.5	2.00
M	Visual aids	15	104.6	2.31
X	Control group	15	104.8	2.35
N	Visual aids	11	102.5	2.44
X	Control group	11	102.4	2.45

honor-point rating, .16 points. Thus pupils from every class were paired* with those of every other class, and means were calculated for all possible combinations. The greatest difference in mean I.Q. for matched pairs from the five classes was 1.12 points and in mean

*See pages 37 to 52 for matched pairs.

honor-point rating, .46 points. Thus in the three ways mentioned above, the classes were made as nearly equal as possible.

Pre-test used. In order to be able to find out at the end of the experiment how much information the pupils had gained by using the different study methods it was necessary to determine how much they knew at the beginning. Later these initial scores were compared with the final scores.

For this purpose an objective test was used, questions for which were selected by the writer from a work book published by the company that printed the textbook. A hundred true-false, fifty matching, and fifty multiple-choice questions were thought to be sufficient to eliminate, to a large extent, the element of chance.

The test was not standardized. Because the writer selected the items from various pages throughout the book on the basis of judgment, the scores could not even be compared with those of any other class. This comparison was not thought to be necessary, however, inasmuch as the purpose in giving the test was not to find out whether the pupils had attained a standard score for their grade but to find how many facts they had learned from the beginning of the experiment to the end.

In selecting questions for this test the writer tried to include only those which were within the comprehension of the pupils and which were not debatable. Consequently, only fact questions were used. Even if some of the broader objectives of the course were thus excluded, it is believed this selection increased the value of the test by increasing its accuracy. Although this test may not have been a perfect measuring instrument, nevertheless there are two reasons why it was thought to be adequate for this experiment.

First, the test had at least three requirements for validity mentioned by Lee.⁹ (1) The items selected measured most of the objectives of the course. Although some of the larger objectives such as an appreciation for good literature; a knowledge of the development of literary forms like the novel, essay, and short-story; and an attitude of respect for significant authors could not be measured satisfactorily, nevertheless the test attempted to measure the objectives of the course. (2) The items paralleled the actual teaching done both in chronological order and in emphasis on important authors and their works. (3) The items represented a wide sampling of the materials taught. The questions were about evenly distributed over the textbook, covering the time from Milton to the present day.

Second, the test was fairly reliable. By using the split-half technique it was found that the coefficient of correlation between the two sets of questions was $+ .71$. The probable error was computed and found to be $\pm .02$. Although this does not indicate high reliability, nevertheless a substantial degree of reliability is shown. This test described above was used as a pre-test at the beginning of the semester. Sixteen weeks later the same form was used as a re-test.

Use of the class period. A ruling by the board of education requires that the class time consist of a twenty-five minute recitation period followed by a thirty minute study period. In every class the procedure during the time allotted to recitation was the same, consisting of discussions, oral and written reviews, and supplementary read-

⁹J. Murray Lee, A Guide to Measurement in Secondary Schools. New York: D. Appleton-Century Company. 1936. Pp. 514.

ing by the teacher of additional works by the various authors and comments by critics.

During the time allotted to study, questions on six or seven pages of the textbook were given to all pupils in order to motivate their work. From this point the procedure in the groups differed widely. In classes A and B, the group using reading materials, hundreds of articles, newspapers, magazines, and books pertaining to the lesson were circulated to help pupils understand and appreciate the text. In classes M and N, the group using visual aids, hundreds of stereographs, drawings, maps, cartoons, pictures, charts--pictorial and graphic materials of all kinds--were circulated. In class X, the control group, only the text was used with no study aid.

At frequent intervals during the semester short tests were given to induce the pupils to answer all the daily questions. In order to enhance whatever effect the study helps might have on final scores, the writer made a constant attempt to stimulate pupils to make all possible use of available materials. The classes, of course, knew nothing of the purpose for supplying these helps. Throughout the sixteen-week period an attempt was made to maintain a normal atmosphere in the schoolroom. None of the pupils seemed to be aware that an experiment was being tried.

CHAPTER III

**AN INTERPRETATION OF THE TEST RESULTS OBTAINED FROM A COMPARISON
OF VISUAL AIDS AND READING MATERIALS IN FIVE CLASSES**

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AN INTERPRETATION OF THE TEST RESULTS OBTAINED FROM A COMPARISON OF VISUAL AIDS AND READING MATERIALS IN FIVE CLASSES

Before the results of the present experiment could be interpreted satisfactorily, statistical treatment of the raw scores obtained from the pre-test and the re-test became necessary. The increase in the number of correct answers from the pre-test to the re-test was recorded as the gain. The smallest gain made by any pupil was 18 points, and the largest made by any pupil was 112 points.

Comparison of mean gains made by classes. Because of the wide range and irregular distribution of the scores a mere inspection of them did not furnish adequate information for comparing the classes. A more satisfactory understanding of the differences was obtained by

TABLE IV

MEAN SCORES IN PRE-TEST, RE-TEST, AND GAIN MADE BY CLASSES
IN ENGLISH LITERATURE IN CONTROL GROUP, GROUP USING
VISUAL AIDS, AND GROUP USING READING MATERIALS

Class	Group	Mean scores in		Mean Gain
		Pre-test	Re-test	
A	Reading	23.00	88.00	65.75
B	Materials	21.61	85.00	64.25
M	Visual	20.85	86.57	66.14
N	Aids	14.09	84.09	68.93
X	Control Group	15.25	95.77	80.41

finding the class means. These revealed that classes M and N, using visual aids, made slightly larger gains than classes A and B, using reading materials. Although the means for the re-test of these four classes varied only 1 or 2 points, lower pre-test scores for the group using visual aids gave a greater apparent gain. Inasmuch as the tests in all classes were given under the same conditions, it is thought that these lower pre-test scores indicate a knowledge of fewer facts on the part of classes M and N rather than any other factor.

The mean gain made by the control group, X, was twelve points larger than that of any other class. A relatively low pre-test score contributed to this gain but probably did not account for it. In fact, a careful study of the means for these five classes would hardly justify any conclusive statements inasmuch as a generalization cannot be made from so few data.

TABLE V

MEAN GAINS MADE BY EQUATED CLASSES IN ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS,
AND GROUP USING READING MATERIALS

Class	Group	Mean scores in		Mean Gain
		Pre-test	Re-test	
A	Reading Materials	22.14	87.66	66.27
B		21.50	83.00	62.67
M	Visual Aids	22.31	87.31	66.97
N		14.89	83.17	68.34
X	Control Group	14.60	93.60	79.00

Comparison of mean gains made by equated classes. Scores made by the classes that were equated with respect to I.Q. and honor-point rating showed a tendency similar to that observed in the classes before they were equated; that is, mean gains made by the group using visual aids were from 2 to 4 points higher than those made by the group using reading materials. Again, the control group made a mean gain of 11 points over any other class.

Comparison of mean gains made by matched pairs of pupils. A study of the pairs from all classes, matched with respect to I.Q. and honor-point rating, shows that there is the same tendency, noted twice above, toward higher mean gains made by the group using visual aids than by the group using reading materials. In fact, wherever a class using visual aids is compared with a class using reading materials, the class using visual aids shows a greater gain even though this may be only a fraction of a point.

This statement loses some of its significance, however, when it is noted that matched pairs from class M, using visual aids, gained only .67 points over matched pairs from class A, using reading materials, whereas, within the group itself using reading materials, matched pairs from class A showed a mean gain of 11.50 points over matched pairs from class B. A difference in gain almost as great as that pointed out between classes A and B, using reading materials, may be seen between classes M and N, using visual aids. Between matched pairs of pupils from classes M and N is a difference in mean gain of 9.44 points. As noted above, control group, X, showed gains over every group with which it was compared.

TABLE VI

MEAN GAINS MADE BY MATCHED PAIRS OF PUPILS IN ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS,
AND GROUP USING READING MATERIALS

Class	Group	Mean Scores in		Mean Gain
		Pre-test	Re-test	
A	Reading materials	22.80	91.20	68.50
B	Reading materials	24.50	81.50	57.00
A	Reading materials	23.53	86.13	65.00
M	Visual aids	18.66	84.00	65.67
A	Reading materials	23.87	85.87	62.94
N	Visual aids	15.31	82.81	68.00
A	Reading materials	24.84	87.69	63.38
X	Control group	12.76	91.84	79.15
B	Reading materials	25.05	86.22	62.17
M	Visual aids	22.00	87.16	65.78
B	Reading materials	20.31	83.37	63.00
N	Visual aids	15.25	87.50	72.06
B	Reading materials	24.18	85.37	62.37
X	Control group	15.37	98.37	83.31
M	Visual aids	21.33	95.44	74.66
N	Visual aids	11.77	76.88	65.22
M	Visual aids	20.20	84.46	63.66
X	Control group	15.33	98.86	83.33
N	Visual aids	14.36	84.72	70.27
X	Control group	14.09	94.54	79.82

Critical ratio of mean gains made by classes. Whether the variations mentioned above were due to a significant difference in gain or to mere chance could not be determined by inspection. Consequently, a critical ratio* was calculated for mean gains of classes, equated

*See pages 53 to 56 for critical ratio of all groups.

classes, and matched pairs of pupils in order to find whether the differences were significant. A critical ratio of .10 indicates only a little more than fifty chances in a hundred that a significant difference exists between the mean gains of class A, using reading materials, and class M, using visual aids. A critical ratio of 1.20 indicates that there are eighty-eight chances in a hundred that a significant difference exists between class B, using reading materials, and class N, using visual aids. In order to be really significant a critical ratio should be 3.00 or over. The only significant ratios in this experiment are those in which the control group is used.

Critical ratio of mean gains made by equated classes. A comparison of mean gains made by equated classes shows a result similar to that noted in the classes before they were equated. Although the gain is consistently in favor of visual aids over reading materials, nevertheless this gain is not significant. Only when the control group is included is there a significant difference.

Critical ratio of mean gains made by matched pairs of pupils. A comparison of gains made by matched pairs of pupils from the five classes in all possible combinations shows a trend similar to that noted in the classes before they were equated and in those that were equated. Pairs using visual aids in every case showed a mean gain over pairs using reading materials, but with no pairs did this gain show a significant difference. The control group showed a significant difference in gain every time it was considered except once--when the control group was compared with class N, using visual aids.

Comparison of upper, middle, and lower thirds of groups using

visual aids and reading materials. In order to find whether the gain made by the group using visual aids over the group using reading materials was affected by the distribution of pupils or whether it was

TABLE VII

COMPARISON OF MEAN GAINS MADE BY UPPER, MIDDLE, AND LOWER THIRDS OF GROUP USING VISUAL AIDS AND GROUP USING READING MATERIALS

Class	Group	N.	Mean Gain	S.D.	C.R.
A, B	Reading materials	Entire group	64.94	16.55	
M, N	Visual aids	Entire group	67.48	15.50	<u>.92</u>
A, B	Reading materials	Upper third	71.63	16.35	
M, N	Visual aids	Upper third	71.69	14.95	<u>.01</u>
A, B	Reading materials	Middle third	61.26	15.15	
M, N	Visual aids	Middle third	63.00	16.50	<u>.36</u>
A, B	Reading materials	Lower third	63.90	12.75	
M, N	Visual aids	Lower third	67.78	14.40	<u>1.20</u>

consistent throughout the entire groups, critical ratios were computed for the upper, middle, and lower thirds of these two groups.

A study of the results shows that in all three brackets the group using visual aids gained more than the group using reading materials. Thus in every comparison made, the group using visual aids gained more than the group using reading materials. Also in every comparison in which the control group was considered it made greater gains than did any other group.

It will be noted in Table VII that the gains made by pupils using

visual aids compared with the gains made by pupils using reading materials show increasing significance in the lower brackets. Thus a critical ratio of .01 for the upper thirds, of .36 for the middle thirds, and of 1.20 for the lower thirds of the two groups may indicate that visual aids are relatively more effective with pupils of low I.Q. than with pupils of high I.Q. This possibility seems to agree with a generalization made by Hoban¹⁰ after an investigation of the use of visual aids:

The amount of concrete experience and its relative degrees of concreteness vary widely in use between the "bright" and the "dull" pupil...It follows, then, that the amount and concreteness of the visual aid necessary to the development of any given level of abstraction is greater where the intellectual maturity of the learner is lower, and vice versa. The "dull" pupil must be furnished much wider concrete experience than must the "bright" pupil.

Whether the "dull" pupils using visual aids profited enough more from the use of these helps than the "dull" pupils using reading materials profited from the use of their study helps cannot be learned from so few data.

¹⁰Charles F. Hoban; Charles F. Hoban, Jr.; and Samuel B. Zisman, Visualizing the Curriculum. New York: The Cordon Company. 1937. Pp. 300.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER STUDY

CHAPTER IV

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER STUDY

Summary. In order to test the relative value of reading materials and visual aids for study helps in eleventh grade English the writer conducted an experiment during the second semester of the year 1938-1939 at Creston High School in Grand Rapids. All the 11-A pupils were arranged in three groups--two classes using visual aids, two classes using reading materials, and one class using no supplementary helps.

These classes were equated on the basis of I.Q. and honor-point rating, and conditions during the recitation period were kept as nearly alike as possible. An objective test was administered at the beginning of the semester and again at the end to see how many facts the pupils had gained.

Within the limits of this experiment the following statements may be made:

1. In every comparison made, classes using visual aids showed a slightly larger gain than classes using reading materials.
2. The control group made the largest gain of all, twelve points higher than any other class.
3. A comparison of upper, middle, and lower thirds of the group using visual aids and the group using reading materials showed an increasing significance in the lower brackets in favor of visual aids.
4. A comparison of upper, middle, and lower thirds of the two groups using study helps showed that the trend in favor of visual aids

was consistent and was not affected by a chance distribution of pupils.

5. There was a greater difference in mean gain between classes in the same group than between classes of different groups. This fact decreases the importance of the statement that there was a trend in favor of visual aids.

6. In spite of a consistent tendency in favor of visual aids the difference between the classes using visual aids and the classes using reading materials was in no case significant as measured by a critical ratio.

7. In all except one of the comparisons in which the control group was used there was a significant critical ratio in favor of the control group.

Conclusions. Within the limits of this study there are a few conclusions which seem to hold true for the conditions under which this experiment was conducted.

1. Some pupils in senior high school learn more from studying visual aids than from studying reading materials.

2. Some pupils even in senior high school seem to enjoy looking at pictures more than they do reading.

3. In a thirty-minute study period pupils seem to learn more about the text from studying only that than they do from spending part of their time using supplementary materials with the text.

4. Small classes may produce higher scores than large classes in this type of experiment although results of other studies contradict this statement. The evidence of the present study is too limited to permit a generalization.

5. A discreet use of visual aids combined with reading materials during the recitation as well as during the study period would probably produce more satisfactory results than the use of either kind of study helps to the exclusion of the other.

Suggestions for further study. It seems evident as a result of the present experiment that visual aids may be a valuable source both of pleasure and of information for pupils. In just what way they may be used most effectively might perhaps constitute the basis for further study. The following studies may be worth making:

1. Whether visual aids are more effective when they are used by the teacher during the recitation period or when they are used by the pupil during the study period.

2. Whether classes learn more from having visual aids presented by the teacher or used in talks and especially prepared reports by classmates.

3. The relative effectiveness of visual aids used alone and in conjunction with reading materials.

4. Whether seeing pictorial and graphic materials which are furnished by the teacher or making these materials themselves would be more effective for pupils.

5. Whether visual aids are more effective for "dull" or for "bright" pupils at the senior high school level.

APPENDIX

TABLE IX

RECORDS MADE BY PUPILS IN CLASS A, USING READING MATERIALS
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-1.....	15-11	132	3.53	25	114	89
A-2.....	15-11	113	2.41	30	100	61
A-3.....	16-11	117	3.53	55	107	54
A-4.....	16- 5	114	3.66	21	101	100
A-5.....	16- 3	114	2.53	51	92	61
A-6.....	15- 6	115	2.66	25	81	56
A-7.....	16-10	113	2.41	40	109	69
A-8.....	16- 2	107	2.16	7	90	83
A-9.....	16-10	107	1.58	13	105	92
A-10.....	17- 7	107	1.27	8	74	66
A-11.....	16-11	106	2.50	55	102	47
A-12.....	16- 9	105	2.08	24	81	57
A-13.....	17-10	104	1.75	11	45	37
A-14.....	15- 9	104	1.55	24	80	56
A-15.....	16- 7	103	2.08	21	66	45
A-16.....	17- 2	103	1.66	26	35	67
A-17.....	18- 5	103	1.33	16	79	63
A-18.....	17- 1	100	2.66	17	85	68
A-19.....	16- 4	100	2.25	16	87	71
A-20.....	17- 8	99	1.93	15	87	72
A-21.....	16- 2	98	3.00	24	76	52
A-22.....	16- 1	97	1.50	21	91	70
A-23.....	16-10	97	1.33	7	83	76
A-24.....	17- 1	96	1.91	23	84	61
A-25.....	17- 7	95	1.50	16	80	64
A-26.....	17- 9	92	2.01	10	35	76
A-27.....	17- 6	92	1.50	33	35	52
A-28.....	16-11	90	2.66	5	32	84
A-29.....	17- 4	90	2.25	20	86	66
A-30.....	16- 3	88	2.25	12	69	57
A-31.....	17- 7	87	1.41	44	94	50
Mean.....	17.1	102.8	2.21	23.00	83.00	65.75

TABLE IX

RECORDS MADE BY PUPILS IN CLASS A, USING READING MATERIALS
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-1.....	15-11	132	3.53	25	114	89
A-2.....	15-11	113	2.41	30	100	61
A-3.....	16-11	117	3.38	53	107	54
A-4.....	16- 5	114	3.66	21	121	100
A-5.....	16- 3	114	2.53	31	92	61
A-6.....	15- 6	113	2.66	25	81	56
A-7.....	16-10	113	2.41	40	109	69
A-8.....	16- 2	107	2.16	7	90	83
A-9.....	16-10	107	1.58	13	105	92
A-10.....	17- 7	107	1.27	8	74	66
A-11.....	16-11	106	2.50	55	102	47
A-12.....	16- 9	105	2.08	24	61	37
A-13.....	17-10	104	1.75	11	43	32
A-14.....	15- 9	104	1.55	24	80	56
A-15.....	16- 7	103	2.08	21	66	45
A-16.....	17- 2	103	1.66	26	93	67
A-17.....	18- 5	103	1.33	16	70	54
A-18.....	17- 1	100	2.66	17	85	68
A-19.....	16- 4	100	2.25	16	87	71
A-20.....	17- 8	99	1.98	13	87	74
A-21.....	16- 2	98	3.00	24	76	52
A-22.....	16- 4	97	2.50	21	91	70
A-23.....	16-10	97	1.33	7	83	76
A-24.....	17- 1	96	1.31	23	84	61
A-25.....	17- 7	93	1.50	16	80	64
A-26.....	17- 9	92	2.31	19	95	76
A-27.....	17- 6	92	1.50	33	95	62
A-28.....	16-11	90	2.66	5	82	77
A-29.....	17- 4	90	2.25	20	86	66
A-30.....	18- 3	88	2.25	12	69	57
A-31.....	17- 7	87	1.41	44	94	50
Mean.....	17.1	102.3	2.21	23.00	86.00	63.75

TABLE X

RECORDS MADE BY PUPILS IN CLASS B, USING READING MATERIALS
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-1.....	15- 6	120	3.91	37	96	59
B-2.....	16- 8	120	3.83	13	76	63
B-3.....	17- 2	120	2.00	8	89	81
B-4.....	16- 0	113	3.66	32	91	59
B-5.....	16- 7	112	2.58	32	95	63
B-6.....	16- 5	111	3.33	11	83	72
B-7.....	16- 5	111	1.75	11	123	112
B-8.....	16- 4	111	1.58	21	74	53
B-9.....	16- 0	110	3.68	6	93	87
B-10.....	16- 7	110	2.91	21	98	77
B-11.....	17- 4	110	2.00	32	84	52
B-12.....	17- 3	110	1.90	8	57	49
B-13.....	16- 9	109	3.16	15	92	77
B-14.....	16-11	108	2.50	52	70	18
B-15.....	16-10	107	2.03	34	70	36
B-16.....	15-11	107	1.00	19	66	47
B-17.....	16- 6	106	2.25	15	85	70
B-18.....	16- 5	105	3.83	22	106	78
B-19.....	16- 9	105	2.75	26	102	76
B-20.....	16- 9	105	2.66	13	74	61
B-21.....	16-11	104	3.66	40	124	84
B-22.....	16- 6	104	1.58	30	65	35
B-23.....	17- 2	103	2.83	37	83	46
B-24.....	17- 1	103	1.46	4	91	87
B-25.....	16- 8	102	1.36	8	58	50
B-26.....	16- 5	101	3.25	43	85	42
B-27.....	17- 6	101	2.75	22	94	72
B-28.....	17-11	98	1.53	24	94	70
B-29.....	16- 6	96	2.66	9	101	92
B-30.....	16- 4	96	2.33	23	82	59
B-31.....	16- 9	96	1.91	8	62	54
B-32.....	16- 9	95	1.66	2	73	71
B-33.....	17- 5	94	2.25	13	77	64
B-34.....	16- 1	93	3.08	43	80	37
B-35.....	17- 9	90	1.75	23	94	71
B-36.....	17- 9	87	1.16	7	75	68
Mean.....	16.3	104.8	2.45	21.61	85.00	64.25

TABLE XI

RECORDS MADE BY PUPILS IN CLASS M, USING VISUAL AIDS
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
M-1.....	16- 8	122	2.75	33	80	62
M-2.....	15-11	120	3.03	31	96	65
M-3.....	16- 3	115	2.91	21	114	25
M-4.....	15- 8	114	3.16	36	102	66
M-5.....	16- 4	114	2.53	25	116	91
M-6.....	16- 5	114	2.38	17	91	74
M-7.....	16- 5	113	1.66	2	74	72
M-8.....	16- 4	112	3.00	37	123	91
M-9.....	16- 9	112	2.58	14	82	68
M-10.....	16- 7	108	2.00	16	77	61
M-11.....	16- 1	108	1.66	27	88	61
M-12.....	16- 1	107	2.61	12	66	54
M-13.....	16- 4	107	2.53	24	99	75
M-14.....	16- 0	106	2.50	13	98	85
M-15.....	16- 0	106	2.33	9	86	77
M-16.....	17- 3	106	2.08	14	81	67
M-17.....	17-11	105	2.58	9	70	61
M-18.....	16- 8	105	1.91	17	83	66
M-19.....	16-11	105	1.50	15	49	34
M-20.....	17- 0	105	1.46	33	86	53
M-21.....	16- 9	104	3.25	31	80	49
M-22.....	16- 3	104	2.91	27	99	72
M-23.....	16-11	104	2.75	73	90	17
M-24.....	16- 8	103	2.25	18	104	86
M-25.....	16- 8	101	2.08	4	81	77
M-26.....	16- 0	100	2.66	19	72	53
M-27.....	16- 2	99	1.66	9	81	72
M-28.....	17- 1	99	1.58	45	81	36
M-29.....	16- 7	98	2.16	11	87	76
M-30.....	16- 8	97	1.27	30	84	54
M-31.....	16-10	91	2.00	16	72	56
M-32.....	17- 0	91	1.41	9	85	76
M-33.....	16- 1	88	1.50	22	100	78
M-34.....	17- 0	88	1.41	8	73	65
M-35.....	17- 4	85	1.75	2	67	65
Mean.....	16.4	104.4	2.22	20.35	86.57	66.14

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TABLE XII

RECORDS MADE BY PUPILS IN CLASS N, USING VISUAL AIDS
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
N-1.....	17- 5	123	3.91	32	120	88
N-2.....	16- 6	122	3.83	22	93	71
N-3.....	16- 2	115	2.00	10	51	41
N-4.....	16- 2	114	2.33	10	69	59
N-5.....	16- 4	113	3.33	9	32	23
N-6.....	16- 5	112	2.25	26	105	77
N-7.....	16- 0	112	1.91	13	103	90
N-8.....	16- 6	110	2.33	12	88	76
N-9.....	16- 2	109	3.00	8	84	76
N-10.....	16-11	109	2.91	25	67	44
N-11.....	16- 0	103	2.58	17	82	65
N-12.....	16- 8	107	3.58	13	39	26
N-13.....	16- 7	107	1.20	16	77	61
N-14.....	16- 6	105	2.33	13	82	69
N-15.....	17- 4	104	1.91	10	59	49
N-16.....	17- 0	101	3.50	9	73	64
N-17.....	16- 4	101	1.33	49	97	48
N-18.....	16- 3	99	3.08	11	67	56
N-19.....	16- 6	99	2.33	13	102	89
N-20.....	16- 3	99	2.25	7	83	76
N-21.....	17- 5	93	1.91	9	85	76
N-22.....	16-11	95	3.33	10	91	81
N-23.....	16- 4	95	1.33	9	65	56
N-24.....	17- 3	95	1.33	13	84	71
N-25.....	17- 3	93	2.25	10	103	93
N-26.....	17- 0	93	1.33	5	82	77
N-27.....	17- 2	92	1.66	30	87	57
N-28.....	16- 7	91	1.33	11	74	63
N-29.....	17- 3	87	2.00	15	74	59
N-30.....	17- 5	87	1.50	7	52	45
N-31.....	16-10	86	1.33	14	77	63
N-32.....	17- 9	84	2.58	4	86	82
Mean.....	17.0	102.0	2.50	14.00	84.00	69.93

TABLE XIII
RECORDS MADE BY PUPILS IN CLASS X, CENTRAL GROUP,
IN ENGLISH LITERATURE

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
X-1.....	16- 6	121	3.25	30	113	83
X-2.....	16- 1	113	1.35	12	100	87
X-3.....	16- 4	117	2.00	9	98	89
X-4.....	17- 0	116	2.69	17	107	90
X-5.....	16-10	115	2.46	21	112	91
X-6.....	16- 3	113	2.00	10	97	87
X-7.....	16- 2	112	2.03	32	114	82
X-8.....	16- 3	110	2.66	23	115	92
X-9.....	17- 1	103	1.53	11	92	81
X-10.....	16- 2	107	3.50	22	122	100
X-11.....	16- 7	106	3.03	5	85	80
X-12.....	16- 7	105	3.75	27	123	96
X-13.....	15-10	104	2.37	17	10	92
X-14.....	16-11	103	2.72	14	109	95
X-15.....	16- 3	103	2.66	6	85	76
X-16.....	16- 8	103	2.53	25	97	72
X-17.....	16-10	103	2.16	10	92	82
X-18.....	15- 2	103	1.66	20	105	85
X-19.....	16-10	102	2.23	3	78	75
X-20.....	16- 9	100	2.91	6	85	77
X-21.....	16- 9	100	2.66	24	91	67
X-22.....	16-10	100	2.50	7	61	54
X-23.....	16- 7	91	2.37	6	94	88
X-24.....	17- 1	90	1.46	19	104	85
X-25.....	17- 2	85	2.50	3	75	66
X-26.....	12-11	65	1.70	9	35	74
X-27.....	13-10	72	1.25	22	77	55
Mean.....	16.3	103.4	2.39	15.25	95.77	80.41

TABLE XIV

PUPILS THAT WERE INCLUDED IN CLASS A, USING READING MATERIALS,
EQUATED WITH OTHER CLASSES

Pupil	Age	I.Q.	H.F.R.	Pre-test	Re-test	Gain
A-1.....	15-11	132	3.53	25	114	89
A-2.....	15-11	118	2.41	30	100	61
A-3.....	16-11	117	3.53	33	107	74
A-4.....	16- 5	114	3.66	31	121	100
A-5.....	16- 8	114	2.53	31	92	61
A-6.....	15- 6	113	2.66	25	81	56
A-7.....	16-10	113	2.41	40	102	69
A-8.....	16- 2	107	2.16	7	90	83
A-9.....	16-10	107	1.53	15	105	92
A-10.....	17- 7	107	1.27	8	74	66
A-11.....	16-11	106	2.50	55	102	47
A-12.....	16- 9	105	3.03	24	81	57
A-13.....	17-10	104	1.73	11	43	37
A-14.....	15- 9	104	1.55	24	80	56
A-15.....	16- 7	103	2.07	21	66	45
A-17.....	17- 5	103	1.33	16	70	53
A-18.....	17- 1	100	2.66	17	85	68
A-19.....	16- 4	100	2.25	16	87	71
A-20.....	17- 6	93	1.53	13	87	74
A-21.....	17- 2	90	3.00	24	76	52
A-22.....	16- 4	97	2.50	21	91	70
A-23.....	16-10	97	1.33	7	85	78
A-24.....	17- 1	96	1.91	23	84	61
A-25.....	17- 7	93	1.50	16	80	64
A-26.....	17- 9	92	2.91	19	95	76
A-27.....	17- 6	92	1.50	33	85	52
A-28.....	16-11	90	2.66	5	89	84
A-29.....	17- 4	90	2.25	20	86	66
A-30.....	18- 3	88	2.25	12	69	57
Mean.....	16.9	103.4	2.25	22.14	87.66	66.27

TABLE XV

PUPILS THAT WERE INCLUDED IN CLASS B, USING LEADING MATERIALS,
EQUATED WITH OTHER CLASSES

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-2.....	16- 8	120	3.33	13	76	63
B-3.....	17- 2	120	2.00	8	80	81
B-5.....	16- 7	112	2.53	32	95	63
B-7.....	16- 5	111	1.75	11	123	112
B-8.....	16- 4	111	1.93	21	74	63
B-10.....	16- 7	110	2.01	21	96	77
B-11.....	17- 4	110	2.30	32	84	52
B-12.....	17- 3	110	1.90	8	57	49
B-14.....	16-11	108	2.50	52	70	18
B-15.....	16-10	107	2.63	34	70	36
B-16.....	15-11	107	1.90	10	66	47
B-17.....	16- 6	106	2.25	15	65	70
B-18.....	16- 3	105	2.75	26	102	76
B-20.....	16- 9	105	2.66	13	74	61
B-21.....	16-11	104	3.66	40	104	64
B-22.....	16- 6	104	1.53	30	65	35
B-23.....	17- 2	103	2.25	37	65	56
B-24.....	17- 1	103	1.46	4	21	27
B-25.....	16- 8	102	1.56	8	36	50
B-26.....	16- 5	101	3.20	45	65	42
B-27.....	17- 6	101	2.75	22	94	72
B-28.....	17-11	98	1.53	24	24	70
B-29.....	16- 6	96	2.66	9	121	92
B-30.....	16- 4	96	2.33	25	62	50
B-31.....	16- 3	96	1.91	8	62	54
B-32.....	16- 3	95	1.66	2	73	71
B-33.....	17- 5	94	2.25	13	77	64
B-34.....	16- 1	93	3.03	43	60	37
B-35.....	17- 9	90	1.75	23	24	71
B-36.....	17- 9	87	1.16	7	75	68
Mean.....	16.9	105.5	2.25	21.50	63.00	62.67

TABLE XVI

PUPILS THAT WERE INCLUDED IN CLASS M, USING VISUAL AIDS,
EQUATED WITH OTHER CLASSES

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
M-1.....	16- 3	122	2.75	23	80	62
M-2.....	15-11	120	3.03	31	96	65
M-3.....	16- 3	115	2.91	21	114	95
M-4.....	15- 8	114	3.16	36	102	66
M-5.....	16- 4	114	2.53	25	116	91
M-6.....	16- 5	114	2.35	17	91	74
M-7.....	16- 4	112	3.00	37	103	61
M-8.....	16- 3	112	2.53	14	82	63
M-13.....	16- 4	107	2.53	24	99	75
M-14.....	16- 0	106	2.50	13	93	85
M-15.....	16- 0	106	2.33	9	86	77
M-18.....	16- 3	105	1.91	17	83	66
M-19.....	16-11	105	1.50	15	49	34
M-20.....	17- 0	105	1.46	33	86	53
M-21.....	16- 9	104	3.25	31	80	49
M-22.....	16- 3	104	2.91	27	99	72
M-23.....	16-11	104	2.75	75	90	17
M-24.....	16- 3	103	2.25	13	104	86
M-25.....	16- 3	101	2.03	4	81	77
M-26.....	16- 0	100	2.66	19	72	53
M-27.....	16- 2	99	1.66	9	81	72
M-28.....	17- 1	99	1.56	45	81	36
M-29.....	16- 7	98	2.10	11	87	76
M-30.....	16- 3	97	1.27	30	64	34
M-31.....	16-10	91	2.00	16	72	56
M-32.....	17- 0	91	1.41	9	65	76
M-33.....	16- 1	83	1.50	22	100	78
M-34.....	17- 0	83	1.41	8	75	65
M-35.....	17- 4	85	1.75	2	67	65
Mean.....	16.4	105.7	2.21	22.31	87.31	66.37

TABLE XVII

PUPILS THAT WERE INCLUDED IN CLASS N, USING VISUAL AIDS,
EQUATED WITH OTHER CLASSES

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
N-1.....	17- 5	123	3.31	52	130	88
N-2.....	16- 6	122	3.33	22	93	71
N-3.....	16- 9	115	2.00	10	51	41
N-4.....	16- 2	114	2.58	10	69	59
N-5.....	16- 4	113	3.33	9	92	83
N-6.....	16- 5	112	2.33	26	103	77
N-7.....	16- 0	112	1.31	13	109	96
N-8.....	16- 6	110	2.33	12	88	76
N-9.....	16- 2	109	3.00	8	84	76
N-10.....	16-11	109	2.31	23	67	44
N-11.....	16- 0	108	2.58	17	82	65
N-12.....	16- 8	107	3.58	19	89	70
N-13.....	16- 7	107	1.20	16	77	61
N-14.....	16- 6	105	2.33	13	82	69
N-15.....	17- 4	104	1.31	10	59	49
N-16.....	17- 0	101	3.50	3	79	76
N-17.....	16- 4	101	1.83	49	97	48
N-18.....	16- 6	99	2.33	13	102	89
N-20.....	16- 8	99	2.25	7	83	76
N-21.....	17- 5	98	1.31	9	85	76
N-23.....	17- 4	95	1.83	9	65	56
N-24.....	17- 3	95	1.33	13	84	71
N-25.....	17- 8	93	2.25	10	108	98
N-26.....	17- 0	93	1.33	5	82	77
N-27.....	17- 2	92	1.66	30	87	57
N-28.....	16- 7	91	1.33	11	74	63
N-29.....	17- 8	87	2.00	15	74	59
N-30.....	17- 5	87	1.50	7	52	45
N-31.....	18-10	86	1.33	14	77	63
Mean.....	17.1	103.0	2.32	14.83	85.17	68.34

TABLE XVIII

PUPILS THAT WERE INCLUDED IN CLASS X, CONTROL GROUP,
EQUATED WITH OTHER CLASSES

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
X-1.....	16- 6	121	3.25	30	113	83
X-2.....	16- 1	113	1.83	12	100	97
X-3.....	16- 4	117	2.08	9	98	89
X-4.....	17- 0	116	2.60	17	107	90
X-5.....	16-10	115	2.46	21	112	91
X-6.....	16- 3	113	2.00	10	97	87
X-7.....	16- 2	112	2.02	32	114	82
X-8.....	16- 3	110	2.66	23	115	92
X-9.....	17- 1	108	1.58	11	92	81
X-11.....	16- 7	106	3.08	5	85	80
X-13.....	16-10	104	2.57	17	100	82
X-14.....	16-11	103	2.75	14	100	85
X-15.....	16- 3	103	2.66	6	82	76
X-16.....	16- 8	103	2.58	25	97	72
X-17.....	16-10	103	2.16	10	92	82
X-18.....	16- 2	103	1.66	20	105	85
X-19.....	16-10	102	2.23	3	70	75
X-20.....	16- 3	100	2.21	6	85	77
X-21.....	16- 9	100	2.66	24	91	67
X-22.....	16-10	100	2.50	7	61	54
X-23.....	16- 7	91	2.37	6	54	48
X-24.....	17- 1	80	1.46	10	104	85
X-25.....	17- 2	85	2.50	9	75	66
X-26.....	19-11	85	1.70	9	83	74
X-27.....	18-10	72	1.25	22	77	55
Mean.....	16.8	103.2	2.23	14.60	93.60	79.00

TABLE XIX

MATCHED PAIRS OF PUPILS AND THEIR SCORES FROM CLASS A,
USING READING MATERIALS, AND CLASS B,
USING READING MATERIALS

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-4.....	16- 5	114	3.66	21	121	100
B-4.....	16- 0	113	3.66	32	91	59
A-5.....	16- 8	114	2.58	31	32	61
B-5.....	16- 7	112	2.58	32	25	63
A-8.....	16- 2	107	2.16	7	20	83
B-15.....	16-10	107	2.03	34	70	36
A-11.....	16-11	106	2.50	55	102	47
B-14.....	16-11	103	2.50	52	70	18
A-14.....	15- 0	104	1.55	24	30	56
B-32.....	13- 6	104	1.53	30	65	35
A-18.....	17- 1	100	2.66	17	55	68
B-27.....	17- 6	101	2.75	22	34	72
A-20.....	17- 8	98	1.50	13	37	74
B-28.....	17-11	98	1.53	24	34	70
A-22.....	16- 4	97	2.50	21	91	70
B-23.....	16- 6	96	2.66	9	101	92
A-34.....	17- 1	96	1.91	23	34	61
B-31.....	16- 9	96	1.91	8	62	54
A-25.....	17- 7	93	1.50	16	30	64
B-32.....	13- 9	95	1.66	2	73	71
Mean A....	16.7	103.00	2.26	22.60	91.20	68.50
Mean B....	17.1	103.00	2.23	24.50	81.50	57.00

TABLE III

MATCHED PAIRS OF PUPILS AND THEIR SCORES FROM CLASS A,
USING READING MATERIALS, AND CLASS M,
USING VISUAL AIDS

Pupil	Age	I.Q.	M.F.P.	Pre-test	Re-test	Gain
A-5.....	16- 8	114	2.58	31	92	61
M-5.....	16- 4	114	2.53	25	116	91
A-6.....	15- 6	113	2.66	25	81	56
M-9.....	16- 9	112	2.58	14	82	68
A-7.....	16-10	115	2.41	40	109	69
M-6.....	16- 5	114	2.58	17	91	74
A-8.....	16- 8	107	2.16	7	90	83
M-10.....	16- 7	108	2.00	16	77	61
A-9.....	16-10	107	1.58	13	105	92
M-19.....	16-11	105	1.50	15	49	34
A-11.....	16-11	106	2.50	55	102	47
M-14.....	16- 0	106	2.50	13	98	85
A-12.....	16- 9	105	2.03	24	81	57
M-16.....	17- 3	106	2.03	14	81	67
A-14.....	15- 9	104	1.55	24	80	56
M-20.....	17- 0	105	1.46	33	86	53
A-15.....	16- 7	103	2.03	21	66	45
M-25.....	16- 8	101	2.03	4	81	77
A-13.....	17- 1	100	2.66	17	85	68
M-26.....	16- 0	100	2.66	12	72	53
A-19.....	16- 4	100	2.25	16	87	71
M-24.....	16- 8	103	2.25	18	104	86

TABLE XX (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-20.....	17- 3	30	1.53	15	37	74
M-28.....	17- 1	30	1.53	45	31	36
A-23.....	16-10	37	1.33	7	33	76
M-30.....	16- 3	37	1.27	50	34	54
A-25.....	17- 7	33	1.50	16	30	64
M-32.....	17- 0	31	1.41	9	35	76
A-31.....	17- 7	37	1.41	44	34	50
M-34.....	17- 0	33	1.41	8	73	65
Mean A....	16.7	103.30	2.02	23.53	37.13	65.00
Mean M....	16.6	103.26	1.27	13.66	34.00	65.67

TABLE XXI

MATCHED PAIRS OF PUPILS AND THEIR SCORES FROM CLASS A,
 USING READING MATERIALS, AND CLASS N,
 USING VISUAL AIDS

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-5.....	16- 8	114	2.58	31	92	61
N-4.....	16- 2	114	2.58	10	69	59
A-7.....	16-10	113	2.41	40	109	69
N-6.....	16- 5	112	2.25	26	103	77
A-8.....	16- 2	107	2.16	7	90	83
N-8.....	13- 6	110	2.33	12	88	76
A-10.....	17- 7	107	1.27	8	74	66
N-13.....	19- 7	107	1.20	16	77	61
A-11.....	16-11	106	2.50	55	102	47
N-11.....	16- 0	103	2.58	17	82	65
A-13.....	17-10	104	1.75	11	43	37
N-15.....	17- 4	104	1.91	10	59	49
A-16.....	17- 2	103	1.66	26	93	67
N-17.....	16- 4	101	1.83	49	97	48
A-19.....	16- 4	100	2.25	16	87	71
N-20.....	16- 8	99	2.25	7	83	76
A-21.....	18- 2	98	3.00	24	76	52
N-13.....	16- 3	99	3.08	11	67	56
A-22.....	16- 4	97	2.50	21	91	70
N-19.....	16- 6	99	2.33	13	102	89
A-23.....	16-10	97	1.33	7	83	76
N-24.....	17- 3	95	1.33	13	84	71
A-24.....	17- 1	96	1.91	23	84	61
N-21.....	17- 5	98	1.91	9	85	76

TABLE XXI (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
A-25.....	17- 7	93	1.50	16	30	64
N-27.....	17- 2	92	1.66	30	87	57
A-27.....	17- 6	92	1.50	33	85	52
N-26.....	17- 0	93	1.33	5	82	77
A-29.....	17- 4	90	2.25	20	86	66
N-25.....	17- 8	93	2.25	10	108	93
A-31.....	17- 7	87	1.41	44	94	50
N-30.....	17- 5	87	1.50	7	52	45
Mean A...	17.0	100.25	1.99	23.37	35.37	62.94
Mean N...	17.0	100.63	2.02	15.31	82.81	63.00

TABLE XXII

MATCHED PAIRS OF PUPILS AND THEIR SCORES FROM CLASS A,
USING READING MATERIALS, AND CLASS X,
CONTROL GROUP

Pupil	Age	I. Q.	H. P. R.	Pre-test	Re-test	Gain
A-5.....	16- 8	114	2.53	31	92	61
X-4.....	17- 0	116	2.69	17	107	90
A-6.....	15- 6	113	2.66	25	81	56
X-8.....	16- 3	110	2.66	23	115	92
A-7.....	16-10	113	2.41	40	109	69
X-5.....	16-10	115	2.46	21	112	91
A-9.....	16-10	107	1.53	13	105	92
X-9.....	17- 1	103	1.53	11	92	81
A-11.....	16-11	106	2.50	55	102	47
X-13.....	15-10	104	2.37	17	109	92
A-15.....	16- 7	103	2.03	21	66	45
X-17.....	16-10	103	2.16	10	92	82
A-18.....	17- 1	100	2.66	17	35	63
X-15.....	16- 3	103	2.66	6	82	76
A-19.....	16- 4	100	2.25	16	37	71
X-19.....	16-10	102	2.23	3	73	75
A-21.....	13- 2	93	3.00	24	76	52
X-20.....	16- 9	100	2.91	6	35	77
A-22.....	16- 4	97	2.50	21	91	70
X-22.....	16-10	100	2.50	7	61	54
A-29.....	17- 4	90	2.25	20	36	66
X-23.....	16- 7	91	2.37	6	54	43
Mean A...	16.7	102.92	2.27	24.84	87.69	63.33
Mean X...	16.6	103.46	2.23	12.76	91.34	79.15

TABLE XXIII

SCORES MADE BY MATCHED PAIRS FROM CLASS B, USING READING MATERIALS,
AND CLASS M, USING VISUAL AIDS

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-5.....	16- 7	112	2.53	32	95	63
M-5.....	16- 4	114	2.53	25	116	91
B-6.....	16- 5	111	3.33	11	83	72
M-4.....	15- 8	114	3.16	36	102	66
B-7.....	16- 5	111	1.75	11	123	112
M-7.....	16- 5	113	1.66	2	74	72
B-8.....	16- 4	111	1.53	21	74	63
M-11.....	16- 1	103	1.66	27	83	61
B-10.....	16- 7	110	2.91	21	93	77
M-8.....	16- 4	112	3.00	37	123	91
B-11.....	17- 4	110	2.00	32	84	52
M-10.....	16- 7	103	2.00	16	77	61
B-14.....	16-11	103	2.50	52	70	13
M-13.....	16- 4	107	2.53	24	99	75
B-15.....	16-10	107	2.03	34	70	36
M-16.....	17- 3	106	2.03	14	81	67
B-17.....	16- 6	106	2.25	15	85	70
M-15.....	16- 0	106	2.33	9	86	77
B-19.....	16- 9	105	2.75	26	102	76
M-12.....	16- 1	107	2.61	12	66	54
B-20.....	16- 9	105	2.66	13	74	61
M-14.....	16- 0	106	2.50	13	93	85
B-22.....	13- 6	104	1.53	30	65	35
M-19.....	16-11	105	1.50	15	49	34

TABLE XXIII (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-23.....	17- 2	103	2.83	37	83	46
M-22.....	16- 3	104	2.91	27	99	72
B-24.....	17- 1	103	1.46	4	91	87
M-20.....	17- 0	105	1.46	33	86	53
B-26.....	16- 5	101	3.25	43	85	42
M-21.....	16- 9	104	3.25	31	80	49
B-27.....	17- 6	101	2.75	22	94	72
M-26.....	16- 0	100	2.66	19	72	53
B-28.....	17-11	93	1.53	24	94	70
M-28.....	17- 1	99	1.53	45	81	36
B-30.....	16- 4	96	2.33	23	82	59
M-29.....	16- 7	93	2.16	11	87	76
Mean B...	16.8	105.66	2.34	25.05	86.22	62.17
Mean M...	16.5	106.44	2.31	22.00	87.16	65.73

TABLE XXIV

SCORES MADE BY MATCHED PAIRS FROM CLASS B, USING READING MATERIALS,
AND CLASS N, USING VISUAL AIDS

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-1.....	15- 6	120	3.91	37	96	59
N-1.....	17- 5	123	3.91	32	120	88
B-2.....	16- 8	120	3.83	13	76	63
N-2.....	16- 6	122	3.83	22	93	71
B-5.....	16- 7	112	2.58	32	95	63
N-4.....	16- 2	114	2.58	10	69	59
B-6.....	16- 5	111	3.33	11	83	72
N-5.....	16- 4	113	3.33	9	92	83
B-9.....	16- 0	110	3.53	6	93	87
N-12.....	16- 8	107	3.58	19	89	70
B-10.....	16- 7	110	2.91	21	98	77
N-10.....	16-11	109	2.91	23	67	44
B-12.....	17- 3	110	1.90	8	57	49
N-7.....	16- 0	112	1.91	13	109	96
B-13.....	16- 9	109	3.16	15	92	77
N-9.....	16- 2	109	3.00	8	84	76
B-14.....	16-11	108	2.50	52	70	18
N-11.....	16- 0	108	2.58	17	82	65
B-21.....	16-11	104	3.66	40	124	84
N-16.....	17- 0	101	3.50	9	79	70
B-23.....	17- 2	103	2.83	37	83	46
N-14.....	16- 6	105	2.83	13	82	69
B-30.....	16- 4	96	2.33	23	82	59
N-19.....	16- 6	99	2.33	13	102	89

TABLE XXIV (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-31.....	16- 9	96	1.91	8	62	54
N-21.....	17- 5	93	1.91	9	85	76
B-32.....	18- 9	95	1.66	2	73	71
N-27.....	17- 2	92	1.66	30	87	57
B-33.....	17- 5	94	2.25	13	77	64
N-25.....	17- 8	93	2.25	10	108	98
B-36.....	17- 9	87	1.16	7	75	68
N-30.....	17- 5	87	1.50	7	52	45
Mean B...	16.3	105.31	2.71	20.31	83.37	63.00
Mean N...	16.7	105.75	2.69	15.25	87.50	72.06

TABLE XXV

SCORES MADE BY MATCHED PAIRS FROM CLASS B, USING READING MATERIALS,
AND CLASS X, CONTROL GROUP

Pupil	Age	I. Q.	H. P. R.	Pre-test	Re-test	Gain
B-3.....	17- 2	120	2.00	8	89	81
X-3.....	16- 4	117	2.08	9	98	89
B-5.....	16- 7	112	2.58	32	95	63
X-5.....	16-10	115	2.46	21	112	91
B-8.....	16- 4	111	1.58	21	74	63
X-9.....	17- 1	108	1.58	11	92	81
B-9.....	16- 0	110	3.58	6	93	87
X-10.....	16- 2	107	3.50	22	122	100
B-11.....	17- 4	110	2.00	32	84	52
X-6.....	16- 3	113	2.00	10	97	87
B-13.....	16- 9	109	3.16	15	92	77
X-11.....	16- 7	106	3.08	5	85	80
B-14.....	16-11	108	2.50	52	70	18
X-8.....	16- 3	110	2.66	23	115	92
B-17.....	16- 6	106	2.25	15	85	70
X-13.....	15-10	104	2.37	17	109	92
B-18.....	16- 5	105	3.83	23	106	73
X-12.....	16- 7	105	3.75	27	123	96
B-19.....	16- 9	105	2.75	26	102	76
X-16.....	16- 8	103	2.58	25	97	72
B-20.....	16- 9	105	2.66	13	74	61
X-15.....	16- 3	103	2.66	6	82	76
B-22.....	13- 6	104	1.58	30	65	35
X-18.....	13- 2	103	1.66	20	105	85

TABLE XXV (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
B-23.....	17- 2	103	2.83	37	83	46
X-14.....	16-11	103	2.75	14	109	95
B-27.....	17- 6	101	2.75	22	94	72
X-21.....	16- 9	100	2.66	24	91	67
B-33.....	17- 5	94	2.25	13	77	64
X-23.....	16- 7	91	2.37	6	64	48
Mean B...	16.7	106.62	2.10	24.13	85.37	62.37
Mean X...	16.5	105.50	2.56	15.37	93.37	83.31

TABLE XXVI

THE SCORES OF MATCHED PAIRS FROM CLASS M, USING VISUAL AIDS,
AND CLASS N, USING VISUAL AIDS

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
M-5.....	16- 4	114	2.53	25	116	91
N-4.....	16- 2	114	2.58	10	69	59
M-6.....	16- 5	114	2.38	17	91	74
N-6.....	16- 5	112	2.25	26	103	77
M-8.....	16- 4	112	3.00	37	123	91
N-9.....	16- 2	109	3.00	8	84	76
M-18.....	16- 8	105	1.91	17	83	66
N-15.....	17- 4	104	1.91	10	59	49
M-22.....	16- 3	104	2.91	27	99	72
N-14.....	16- 6	105	2.83	13	82	69
M-30.....	16- 8	97	1.27	30	84	54
N-24.....	17- 3	95	1.33	13	84	71
M-32.....	17- 0	91	1.41	9	85	76
N-26.....	17- 0	93	1.33	5	82	77
M-33.....	16- 1	83	1.50	22	100	78
N-30.....	17- 5	87	1.50	7	52	45
M-34.....	17- 0	83	1.41	8	73	65
N-31.....	18-10	86	1.33	14	77	63
Mean M...	16.5	101.46	2.03	21.33	95.44	74.66
Mean N...	17.0	100.55	2.00	11.77	76.83	65.22

TABLE XXVII

THE SCORES OF MATCHED PAIRS FROM CLASS M, USING VISUAL AIDS,
AND CLASS X, CONTROL GROUP

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
M-2.....	15-11	120	3.03	31	96	65
X-1.....	16- 6	121	3.25	30	113	83
M-5.....	16- 4	114	2.53	25	116	91
X-4.....	17- 0	116	2.69	17	107	90
M-6.....	16- 5	114	2.33	17	91	74
X-5.....	16-10	115	2.46	21	112	91
M-9.....	16- 9	112	2.53	14	82	68
X-8.....	16- 3	110	2.66	23	115	92
M-14.....	16- 0	106	2.50	13	93	80
X-13.....	15-10	104	2.37	17	109	92
M-17.....	17-11	105	2.53	9	70	61
X-14.....	16-11	103	2.75	14	109	95
M-19.....	16-11	105	1.50	15	49	34
X-9.....	17- 1	103	1.53	11	92	81
M-20.....	17- 0	105	1.46	33	86	53
X-13.....	18- 2	103	1.60	20	105	85
M-21.....	16- 9	104	3.25	31	80	49
X-11.....	16- 7	106	3.03	5	85	80
M-23.....	16-11	104	2.75	73	90	17
X-16.....	16- 8	103	2.58	25	97	72
M-24.....	16- 8	103	2.25	13	104	86
X-19.....	16-10	102	2.23	3	73	75

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TABLE XXVII (Continued)

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
M-25.....	16- 8	101	2.08	4	81	77
X-17.....	16-10	103	2.16	10	92	82
M-26.....	16- 0	100	2.66	19	72	53
X-15.....	16- 3	103	2.66	6	82	76
M-32.....	17- 0	91	1.41	9	85	76
X-24.....	17- 1	90	1.46	19	104	85
M-35.....	17- 4	85	1.75	2	67	65
X-26.....	19-11	85	1.70	9	83	74
Mean M...	16.6	104.60	2.31	20.20	84.46	63.66
Mean X...	16.9	104.80	2.35	15.33	93.86	83.33

TABLE XXVIII

THE SCORES OF MATCHED PAIRS FROM CLASS N, USING VISUAL AIDS,
AND CLASS X, CONTROL GROUP

Pupil	Age	I.Q.	H.P.R.	Pre-test	Re-test	Gain
N-3.....	16- 9	115	2.00	10	51	41
X-3.....	16- 4	117	2.03	9	93	89
N-4.....	16- 2	114	2.53	10	69	59
X-5.....	16-10	115	2.46	21	112	91
N-9.....	16- 2	109	3.00	3	84	76
X-11.....	16- 7	106	3.03	5	35	30
N-11.....	16- 0	108	2.53	17	32	65
X-3.....	16- 3	110	2.66	23	115	92
N-12.....	16- 8	107	3.53	19	39	70
X-10.....	16- 2	107	3.50	22	122	100
N-14.....	16- 6	105	2.83	13	32	69
X-14.....	16-11	103	2.75	14	100	95
N-17.....	16- 4	101	1.33	49	97	43
X-13.....	13- 2	103	1.66	20	105	35
N-19.....	16- 6	99	2.33	13	102	39
X-22.....	16-10	100	2.50	7	61	54
N-25.....	17- 3	93	2.25	10	103	93
X-23.....	16- 7	91	2.37	6	54	43
N-26.....	17- 0	93	1.33	5	32	77
X-24.....	17- 1	90	1.46	19	104	35
N-22.....	17- 9	84	2.53	4	36	32
X-25.....	17- 2	85	2.50	9	75	66
Mean N...	16.7	102.54	2.44	14.36	84.72	70.27
Mean X...	16.8	102.45	2.45	14.09	94.54	79.32

TABLE XXIX

COMPARISON OF GAINS MADE BY FIVE CLASSES OF ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS,
AND GROUP USING READING MATERIALS

Class	Group	I.Q.	H.P.R.	Pre-test	Re-test	Gain	S.D.	C.R.
A	Reading materials	102.8	2.21	23.00	83.00	65.75	13.90	
M	Visual aids	104.4	2.22	20.35	86.57	66.14	15.35	<u>.10</u>
A	Reading materials	102.8	2.21	23.00	83.00	65.75	13.90	
M	Visual aids	102.0	2.39	14.09	84.09	63.93	14.96	<u>.37</u>
B	Reading materials	104.3	2.45	21.61	85.00	64.25	17.00	
M	Visual aids	104.4	2.22	20.35	86.57	66.14	15.35	<u>.43</u>
B	Reading materials	104.8	2.45	21.61	85.00	64.25	17.00	
N	Visual aids	102.0	2.39	14.09	84.09	63.93	14.96	<u>1.20</u>
A,B	Reading materials	103.9	2.34	22.26	86.44	64.94	16.55	
M,N	Visual aids	103.2	2.27	17.63	84.95	67.43	15.50	<u>.92</u>
A,B	Reading materials	103.9	2.34	22.26	86.44	64.94	16.55	
X	Control group	103.4	2.39	15.25	95.77	80.41	13.35	<u>4.74</u>
M,N	Visual aids	103.2	2.27	17.63	84.95	67.43	15.50	
X	Control group	103.4	2.39	15.25	95.77	80.41	13.35	<u>4.05</u>

TABLE XXX

COMPARISON OF GAINS MADE BY EQUATED CLASSES OF ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS,
AND GROUP USING READING MATERIALS

Class	Group	I.Q.	H.P.R.	Pre-test	Re-test	Gain	S.D.	C.R.
A	Reading materials	103.4	2.25	22.14	37.66	66.27	13.95	
M	Visual aids	103.7	2.21	22.31	37.31	66.97	17.55	<u>.16</u>
A	Reading materials	103.4	2.25	22.14	37.66	66.27	13.95	
N	Visual aids	103.0	2.32	14.39	33.17	63.34	15.00	<u>.54</u>
B	Reading materials	103.5	2.23	21.50	33.00	62.67	19.40	
M	Visual aids	103.7	2.21	22.31	37.31	66.97	17.55	<u>.33</u>
B	Reading materials	103.5	2.23	21.50	33.00	62.67	19.40	
N	Visual aids	103.0	2.32	14.39	33.17	63.34	15.00	<u>1.26</u>
A,B	Reading materials	103.4	2.24	21.73	35.29	64.44	17.05	
M,N	Visual aids	103.3	2.25	13.60	35.15	67.66	16.40	<u>1.04</u>
A,B	Reading materials	103.4	2.24	21.73	35.29	64.44	17.05	
X	Control group	103.2	2.29	14.60	93.60	79.00	12.35	<u>4.29</u>
M,N	Visual aids	103.3	2.25	13.60	35.15	67.66	16.40	
X	Control group	103.2	2.29	14.60	93.60	79.00	12.35	<u>3.33</u>

TABLE XXXI

COMPARISON OF GAINS MADE BY MATCHED PAIRS OF PUPILS IN ENGLISH LITERATURE
IN CONTROL GROUP, GROUP USING VISUAL AIDS, AND
GROUP USING READING MATERIALS

Class	Group	I.Q.	H.P.R.	Pre-test	Re-test	Gain	S.D.	C.R.
A	Reading materials	103.00	2.26	22.80	91.20	68.50	13.10	
B	Reading materials	103.00	2.29	24.50	81.50	57.00	21.05	<u>1.46</u>
A	Reading materials	103.20	2.02	23.53	88.13	65.00	13.25	
M	Visual aids	103.26	1.97	18.66	84.00	65.67	16.80	<u>.12</u>
A	Reading materials	100.25	1.99	23.87	85.87	62.94	11.50	
N	Visual aids	100.68	2.02	15.31	82.81	68.00	15.00	<u>1.07</u>
A	Reading materials	102.92	2.27	24.84	87.69	63.38	12.00	
X	Control group	103.46	2.28	12.76	91.84	79.15	12.65	<u>3.26</u>
B	Reading materials	105.66	2.34	25.05	86.22	62.17	21.20	
M	Visual aids	106.44	2.31	22.00	87.16	65.78	16.50	<u>.57</u>
B	Reading materials	105.31	2.71	20.31	83.37	63.00	16.30	
N	Visual aids	105.75	2.69	15.25	87.50	72.06	16.35	<u>1.64</u>
B	Reading materials	106.62	2.10	24.18	85.37	62.37	18.15	
X	Control group	105.50	2.56	15.37	98.37	83.31	12.55	<u>3.80</u>

TABLE XXXI (Continued)

Class	Group	I.Q.	H.P.R.	Pre-test	Re-test	Gain	S.D.	C.R.
M	Visual aids	101.46	2.03	21.33	95.44	74.66	12.20	
N	Visual aids	10.55	2.00	11.77	76.83	65.22	12.45	<u>1.62</u>
M	Visual aids	104.60	2.31	20.20	84.46	63.66	19.70	
X	Control group	104.30	2.35	15.33	93.36	83.33	7.15	<u>3.63</u>
N	Visual aids	102.54	2.44	14.36	84.72	70.27	15.00	
X	Control group	102.45	2.45	14.09	84.54	79.82	15.95	<u>1.40</u>

TABLE XXXII

GAINS MADE BY BOYS COMPARED WITH GAINS MADE BY GIRLS IN FIVE CLASSES OF
ENGLISH LITERATURE INCLUDING CONTROL GROUP, GROUP USING
VISUAL AIDS, AND GROUP USING READING MATERIALS

Class	Group	N.	I.Q.	H.P.R.	Pre-test	Re-test	Gain	S.D.	C.R.
A	Boys	13	102.9	2.13	25.30	86.07	61.85	15.20	
	Girls	18	102.8	2.27	21.33	89.38	68.55	12.10	<u>1.31</u>
B	Boys	12	104.2	2.09	20.92	76.33	61.75	18.25	
	Girls	24	105.0	2.65	22.37	87.58	65.50	18.70	<u>.57</u>
M	Boys	13	102.7	2.06	14.92	80.69	66.07	10.25	
	Girls	22	105.9	2.32	24.59	90.05	66.64	18.90	<u>.11</u>
N	Boys	17	101.5	2.07	14.47	78.29	64.28	15.60	
	Girls	15	102.6	2.69	14.00	88.66	74.33	12.15	<u>2.04</u>
X	Boys	13	104.0	2.27	14.15	96.84	82.23	14.24	
	Girls	14	102.7	2.52	16.57	94.73	79.29	12.35	<u>.57</u>
All	Boys	68	102.9	2.10	15.35	84.02	67.11	16.70	
	Girls	93	104.1	2.48	20.42	89.77	70.25	16.20	<u>1.19</u>

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