AN EVALUATION OF THE READING PROGRAM FOR STUDENTS IN BASIC TRAINING FOR SKILLS DEVELOPMENT AT THE COLLEGE OF FISHERIES, NAVIGATION, MARINE ENGINEERING AND ELECTRONICS

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AN EVALUATION OF THE READING PROGRAM FOR STUDENTS IN BASIC TRAINING FOR SKILLS DEVELOPMENT AT THE COLLEGE OF FISHERIES, NAVIGATION, MARINE ENGINEERING AND ELECTRONICS

Presented to

the Faculty of the Department of Curriculum and Instruction

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ABSTRACT

The purpose of the internship was to evaluate the reading program for the upgrading students who are enrolled in the Basic Training for Skills Development (BTSD) at the College of Fisheries, Navigation, Marine Engineering and Electronics in St. John's, Newfoundland.

The study attempted to determine student reading gain and to establish the extent to which attitude, IQ, sex, and the number of completed reading selections were responsible for reading gain.

The sample consisted of 120 adult students who were enrolled in upgrading courses between September, 1974, and January, 1976. Sixty-six of the subjects were male, forty-five were married, and all were school dropouts. Their average age was twenty- four.

Immediately after registration, the investigator administered the TABE Reading Test, the Raven Matrices, the Estes' Test of Attitude Toward Reading, and SRA and RFU Placement Tests to each entrant. Retesting was carried out prior to graduation. The TABE reading scores were used for the purpose of pretesting and posttesting.

The subjects took daily reading instruction in the Laboratory using EDL Controlled Reading Machines, and SRA and RFU reading kits. Instruction in syntax and diction was emphasized throughout the program. Exercises dealing with sentence structure and vocabulary building were given as the need arose.

The analysis showed that the number of completed reading selections was the most important factor in determining reading gain. Significant correlations were found between Attitude, Academic Achievement and reading

gain. The IQ and Sex correlations were nonsignificant. The study revealed that all students made substantial gains in reading speed and comprehension especially in the early stages of the program. The overall mean reading gain was 2.44 grades, while those students who completed more than 300 reading selections recorded a mean reading gain of 3.1 grades. The investigator concluded that the reading program was capable of raising student reading levels sufficiently high to allow them to progress successfully in the BTSD program.

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Chapter 1

THE STUDY

INTRODUCTION

For more than a decade, the Academic Department of the College of Fisheries has operated a reading laboratory to provide instruction in reading for upgrading students. Until now, no evaluation has been carried out to test either the instructional methods or materials that have been used in the laboratory. This internship is a study which was conducted to evaluate the reading program for upgrading students at the College of Fisheries.

BACKGROUND

The upgrading section of the Academic Department of the College of Fisheries has provided instruction in English, mathematics, and science since 1964 to those students who have enrolled in the upgrading courses. From the outset, it became obvious that reading instruction would also have to be provided for the students, all of whom had previously dropped out of high school, elementary school or adult classes, if they were to become successful in achieving their academic goals, usually Grade X or Grade XI. During the period 1964-1972, reading texts, machines, kits, as well as other reading devices, were employed to upgrade student reading levels. While student progress was obvious, no evaluative studies were undertaken to measure student reading gain.

This organization was no longer adequate when, in 1973, the College of Fisheries adopted the federally funded Basic Training for Skill Development (BTSD) program. This is a continuous intake/output program, the basic philosophy of which is that each entrant must be upgraded as quickly as possible to the point where he can enter job-training courses. The introduction of the time factor prompted instructors to become more aware of evaluation, not only of the students, but also of the curricula and instruction.

PURPOSE

The study was conducted to determine the extent to which the Reading Laboratory at the College of Fisheries was fulfilling the purpose for which it was intended. The investigator sought to discover the measure of student improvement in reading, and to establish whether biases toward IQ, sex, or attitude existed. Specifically the purpose of the study was four-fold:

1. To determine the reading gain of a selected group of students in the BTSD program.
2. To ascertain the extent to which attitude, IQ, sex, academic achievement, and the number of selections completed by the students contributed to reading gain.
3. To determine if there was an interaction between sex and the number of selections completed by the students in the study.
4. To inaugurate and to report on a study of the EDL Controlled Reader.

NEED FOR THE STUDY

The average reading level of the students who enrolled in the BTSD program was approximately Grade VII. The average reading level of the course content was found, by applying the Fry Readability formula, to be above Grade X. Therefore, to ensure that the students were able to cope with the English, mathematics, and science courses, a reading program was needed that would accelerate the raising of student reading levels early in the program and continue to raise them during the duration of the program. An evaluation was considered necessary to determine the extent to which the reading instruction was meeting its objective.

QUESTIONS TO BE ANSWERED

The study was designed to find answers to the following questions:

1. What is the mean reading gain of a selected group of students in the BTSD program?
2. Is there a significant correlation between
   (a) IQ and reading gain?
   (b) Sex and reading gain?
   (c) Attitude and reading gain?
   (d) Academic Achievement and reading gain?
   (e) The number of reading selections completed by the students and reading gain?
3. Can IQ, sex, attitude, academic achievement, and the number of selections completed be used to predict reading gain?

4. Is the interaction between sex and the number of selections completed significant?
5. Do the students' reading scores with the Controlled Reader compare favourably with those away from the EDL Controlled Reader?

SUBJECTS OF THE STUDY

All the students who entered the BTSD upgrading course at the College of Fisheries between September, 1974, and April, 1975, were pretested by the investigator and were considered potential subjects for this study. Those students who had enrolled in the course before September, 1974, were rejected because of their having received reading instruction from other instructors; and those who entered after September, 1975, were not considered since their time in the course was insufficient to produce meaningful and valid results.

Of the 263 students who entered, 143 dropped out of the course. Because they left without notice, they were not fully documented and, therefore, could not be used in this study. The remaining 120 students served as subjects. All received reading instruction from the investigator.

Sixty-six or 55 percent of the subjects were male, and 54 or 45 percent were female. Their average age was twenty-four. Forty-five or 37.5 percent were married. The average grade completed in school was 8.2 with a range from Grade VI to Grade X. All the subjects had had previous work experience, but few had been happily

employed. Each expressed a desire to achieve academically in order to pursue a trade to ensure better or permanent employment.

SCOPE OF THE STUDY

The study was conducted in the Reading Laboratory of the College of Fisheries. It was begun in September, 1974, and completed in January, 1976, a period of seventy-three weeks. The average time spent by the subjects was thirty-six weeks, with a range from eighteen to fifty-six weeks. The statistics on which the study was based were compiled from more than 4,300 student-weeks during which over 600,000 questions were answered. The subjects completed approximately 318,000 reading exercises, 104,000 of which were done with EDL Controlled Readers. An additional 1,400 Efficiency Checks containing 14,000 questions were administered. The checking, compiling and recording of all results were carried out by the investigator. The data were analyzed by computer at Memorial University.

EXPLANATION OF TERMS

This study contains many terms which, because of their nature, need to be explained. Some are highly technical, while others have had but a narrow, restricted usage, and are not widely known. Those which have been employed repeatedly and need elucidation are explained below.

The Academic Department. One of six departments of the College of Fisheries whose primary function is to design and teach multi-levelled courses in academic areas, and to administer the Basic

Training for Skill Development program.

BTSD. Basic Training for Skill Development. A federally funded program providing individualized instruction in mathematics, science and English, especially designed for adults who have not completed high school but who wish to acquire additional skills to enter job-training courses.

EDL. Educational Developmental Laboratories. A subsidiary of McGraw-Hill located in Huntington, New York, this company was principally responsible for the design and manufacture of Controlled Readers and controlled reading programs.

Controlled Reader. A mechanical device for projecting words onto a screen at a controlled speed.

RFU. Reading for Understanding. A kit containing 4,000 reading comprehension exercises designed to aid students in improving their ability to get meaning from their reading.

SRA. Science Research Associates, Inc. The developers of individualized, multi-level reading kits.

TABE. Tests of Adult Basic Education. This was the instrument used by the investigator in this study for pretesting and posttesting.

Efficiency Check. A reading selection correlated with EDL reading material used in this study to compute subjects' reading rate and comprehension scores away from the EDL Controlled Reader.

Reading Laboratory. The room at the College of Fisheries in which reading instruction is provided and where this study was conducted.

ORGANIZATION OF THE REPORT

This chapter has included an introduction to the study, necessary background information, the need for the study, the objectives, the questions to be answered by the study, and the scope of the study. In Chapter 2 pertinent literature concerning the relationship between reading and dropouts, controlled reading devices, the SRA and RFU reading kits, comprehension and syntax, and individualized reading is reviewed. The methodology employed in carrying out the study is outlined in Chapter 3, and the data are analyzed in Chapter 4. Chapter 5 deals with the study of the EDL Controlled Reader. A summary, conclusions and recommendations are contained in Chapter 6.

Chapter 2

REVIEW OF LITERATURE

The review of literature will deal with reading and dropouts, individualized reading, controlled reading devices, and vocabulary syntax.

READING AND DROPOUTS

The Academic Department decided to provide reading instruction for upgrading students because many of the entrants display inadequate reading skills. All of the students in the BTSD program are school dropouts. Numerous studies have been conducted in Newfoundland and elsewhere to substantiate the close relationship between school dropouts and poor reading ability. The Royal Commission on Education and Youth (Warren, 1967) cites the lack of ability to read as the second major cause of dropouts. Kennedy (1966) in a ten-year study on the dropout problem in Newfoundland, concluded that dissatisfaction and difficulty in school, both of which may be attributed to inadequate reading skills, were the chief causes of students leaving school. She quotes from earlier studies by Brewer, Fox, Bourque, and Schriebner, all of whom give ineffective reading ability as the primary cause of dropouts in selected American schools.

INDIVIDUALIZED READING

Reading instruction in the Reading Laboratory at the College of Fisheries was given on an individualized basis. Each student worked at the reading level and reading speed most suitable to him,

and each student's acceleration usually differed from all others. The reason for using an individualized approach was chiefly the format of the BTSD program, the courses of which operate on an individualized basis; nevertheless, studies have proven the superiority of individualized reading programs over the more conventional types. Booth (1970), Odom (1971), and Rauch (1971) reported positive effects on student attitude due to individualized reading techniques. Slow learners achieved more successfully, while fast learners were challenged. Reading became more meaningful and enjoyable since diagnosis, evaluation, and guidance were individualized. Davis and Lucus (1971), and Nemeth (1969) concluded that individualized reading is definitely superior to the more conventional (e.g. basal readers, workbooks, etc.) methods of teaching reading to seventh and eighth grade students.

Two individualized reading kits, the SRA III B, and the FRU, were used in this study. In his review of literature, the investigator became acquainted with numerous descriptive studies pertaining to individualized reading. Many authors advocated the use of the SRA multi-level reading format, but only two empirical studies were documented. Guerney (1966) experimented with two classes of fourth-grade students for a fourteen-week period. He found that the students who used the multi-level program made significantly higher gains than the control group. Pont (1966) reported on a study in which the SRA reading kit was used for a twelve-week period. He concluded: "It would appear that the SRA reading laboratory [kit] simply enables pupils to reach their ceiling, or at least a higher level of attainment, more quickly than those not using it."

CONTROLLED READING DEVICES

One of the basic concepts which underlie the use of controlled reading is that the eye perceives only when it is at rest (Taylor, 1962). By means of eye-movement photography, researchers have discovered that, during the reading process, the eye stops or fixates; that it moves in a left-to-right direction, or it regresses, that is, it moves in a right-to-left direction. It has also been discovered that skilled readers have fewer fixations, shorter fixations, and fewer regressions than poor readers. These discoveries have been confirmed by computer analysis. A recent study by Hawley, Stern and Chen (1974) has demonstrated that, "in relatively skilled readers, fixation duration for the fixation pause prior to, during, and immediately following regressive eye movements are significantly shorter than those associated with normal reading patterns. The first fixation pause after the return sweep and the last fixation are the longest."

Since the advent of reading-eye photography and computer analysis, it has become a common practice to organize the factors connected with reading into two categories: functional factors and interpretative factors. Eye-span, regressions, and fixations are examples of functional factors, while decoding, perceiving, judging, and evaluating are examples of interpretative factors. Reading specialists who are concerned with and who support controlled reading are interested in the functional factors of reading because it is in this area of reading, they contend, that change can occur and improvements can be made. No definitive statement, however, has been made by reading specialists agreeing that eye movements cause, are caused by,

or are not related to interpretative factors. Actually three points of view are prevalent among reading specialists. One school of thought holds that poor reading is caused by inefficient eye-movement habits, and that special training in eye movements would produce better readers. Another school of thought holds the opposite view: eye movements are determined by the student's thinking ability. A third point of view supported by Taylor (1960) is that eye movements are neither the cause, nor the effect of poor reading, but are a reflection of the individual's functional and interpretative development. Spache (1962) concurs with Taylor, adding that eye movement records are useful to indicate specific corrective reading procedures for inefficient readers.

Another basic tenet of controlled reading supporters is that the reading habits of most people are stationary, and changes occur only with maturity. Studies by Tinker (1936), Gilbert and Gilbert (1942), Eurich (1930) and Litteret (1932) established the fact that a student's reading habits in terms of fixations, regressions, duration, and rate remain consistent during a single reading. The contention that the number of fixations varies with the type of reading material, the content of the reading material, and the difficulty of the reading material could not be supported by research. (Aprendt and Mosedale, 1971.) Carmichael and Dearborn (1947) found that most people cannot control eye movements during reading. Seibert (1943) found that changing the subject matter does not produce an appreciable change in the number of fixations. Taylor, Frackenpohl and Pettee(1960) found no difference in the number of fixations of students reading at, or below, their reading level. They found a significant difference when students read material 2.5 grades

above their grade level.

The argument, then, for using controlled reading as presented by those who advocate it is that the method of instruction must be able to change students' reading habits if they are to become proficient readers. A study by Taylor and Robinson (1963) suggests that "children enter kindergarten with certain existing oculo-motor habits born out of their accumulated 'looking' experiences." A later study by Taylor (1965) concluded that "average and below-average readers ... tend to maintain the same oculo-motor activity in approaching most types of reading unless extraordinary conditions interfere." Taylor and Frackenpohl (1968) conclude as a result of examining tens of thousands of eye-movement photographs that, for the majority of people, the activity of reading is a rather habitual and not very efficient process. The method that they propose to change bad reading habits to efficient reading habits is controlled reading. A student, they contend, cannot change from an inefficient reader to an efficient reader by reading from books, by changing the difficulty of the reading material or by changing the content of the reading material. They summarize their argument as follows:

> In general, it would appear that students at all levels, as well as adults, need specific instruction to develop proficiency in the visual-functional and perceptual skills that make the difference between laborious, inefficient reading and fluent, efficient reading. They need to build coordination and motility so that they will become more comfortable readers, develop better directional attack in order to be more thorough and systematic perceptually, achieve more rapid and accurate word recognition and develop the ability to associate more rapidly.

The concept of controlled reading arose early in this century when American researchers and investigators discovered a close interaction between physiological and psychological aspects of reading. In

1906, Walter F. Dearborn suggested that it was possible to train students to read more efficiently if they were to use a directional attack. Berger (1966) reported the first index reference to mechanical devices in reading appeared in the fifth volume of Psychological Abstracts in 1932 with the publication of two studies, one by Horace T.C. Tu of Amoy, China, and the other by A.C. Eurich of the University of Minnesota. He also related that at the same time a long series of studies related to reading and reading devices was started by Miles A. Tinker at the University of Minnesota.

Two types of reading devices preceded the controlled reader: the tachistoscope and the pacer. The tachistoscope projects an image on a screen for periods from two seconds to one-thousandth of a second, the length of projection time being controlled by a timing device, while the pacer contains a movable bar or screen under which the printed material is placed. The bar or screen descends over the printed lines at a timed pace measured in words per minute.

The first reading machine was the metronoscope (a type of tachistoscope) developed by Earl A. Taylor in 1937, but it was not until the introduction of the Controlled Reader by Educational Developmental Laboratories, Inc. of Huntington, New York in 1954 and the Controlled Reader, Jr. in 1961 that controlled reading devices became common place in schools, reading clinics, and reading laboratories in the United States and Canada and, more recently, in Europe and Australia.

The research prior to 1954 used tachistoscopic devices in the experimental group. Taylor (1937) used fifty high school students to compare the metronoscope with mimeographed sheets and found no significant

difference. Lee (1939) reported the following conclusions from his study with the metronoscope:

(a) Lip reading was eliminated.

(b) The number of regressions was reduced.

(c) The duration of fixations was reduced.

(d) The number of fixations was reduced.

(e) The eye-span was increased.

(f) Speed was increased.

(g) Comprehension was increased.

(h) Better attitude was increased.

(i) Failure in reading and reading subjects was reduced.

Cason (1963) was the first to use elementary students in the experimental group. He divided fifty-one grade three students into two groups. One group received phrase training without the use of any instrument, while the other group was exposed to the same material with the metronoscope. He reported no significant difference between the groups either in reading gain or improvement of eye movements. Stroud (1945) found a .50 correlation between rate of reading gain and perception using a tachistoscope with 570 elementary school students. Westover (1946) experimented with 140 college freshmen using controlled pacing and book exercises. Although he found no difference between the groups, he discovered that the experimental group retained gains in rate and comprehension. Glock (1949) used Harvard Films to research reading rate with college students and found no significant difference between methods in increased rate. Monolakes (1952) found that the control group did significantly better than the experimental group who

used reading rate controller and tachistoscopes. He experimented with thrity-four marine officers. Holmes (1953), using fifteen oil company executives, reported that gains in reading averaged 166 words per minute using tachistoscopes and Harvard Films. Weeden (1954) reported that the experimental group using tachistoscopes made significant gains in rate and flexibility over the control group who used books. Wooster (1954) found no difference between the experimental group who used reading rate controller, and the control group who did not. Cosper and Kephart (1955), who also used tachistoscopic methods in their study, found that 60 percent of the rate of increase was retained fourteen months after the experiment ended. Jones (1954) reported no difference between groups, but no loss in rate when retested eight months after the experiment. He used tachistoscopes and Harvard Films with fifty-six auto company executives. Blough (1956) used 324 high school students in the experimental group and 283 in the control group. His experiment, consisting of fourteen teaching sessions, had the experimental group using pacers, films, and especially prepared reading materials make gains of 24.6 percent in reading rate and 7.5 percent in comprehension, while the control group had gains of 7.5 percent and 3.17 percent respectively.

In reviewing the research for the twenty-year period, 1934-1954, Berger (1971) noted that tachistoscopic and controlled pacer devices were effective in increasing reading rate and comprehension, and that gains made during the experiments were retained when the subjects were retested later. Karlin (1958), however, in reviewing similar research, concluded that in only one of twelve investigations did mechancial devices equal or surpass natural reading, and suggested

that it was unreasonable to invest monies in mechanical reading devices.

Investigations especially concerned with EDL Controlled Readers began approximately five years after their introduction by Stafford E. Taylor in 1954. The investigator reviewed six studies, all carried out by American researchers.

A very well documented study was carried out in the Spokane Public schools by Kiehn and Moss and reported by Bottomly (1961). This study is especially interesting because the control group proceeded with a recently developed reading program prepared by the reading consultant and designed to improve all aspects of reading, including values. Since this study was conducted in conjunction with a well organized reading program, the findings are all the more valid. The summary of their results shows that:

1. The major use of the Controlled Reader should be in boosting reading speed, although it appears to have a beneficial, if delayed, effect on reading comprehension and vocabulary development.
2. Its best use is with average, or better, achievers who do not, at first, read rapidly. It should not, perhaps, be used with students who already read rapidly.
3. Since the experiment showed the greatest results after the Controlled Reading program had terminated, it should be considered a natural element of any long term developmental reading program.
4. The Controlled Reading program appears to have a more immediate effect upon reading speed in the fifth grade than in the eighth grade. It also appears to have a greater value in boosting reading speed among the pupils of the lower socioeconomic area of the city than among those in the upper socioeconomic area.

A study by Hoffman (1962) was carried out in Hannah Penn Junior High School of York, Pennsylvania. Grade eight students were tested in September, 1961, and retested in May, 1962. The experimental group used the Controlled Reader, while the control group followed the traditional methods. The results showed that the control group gained 12.1 percent while the experimental group gained 21.1 percent. Other teachers in the school noticed that the experimental group improved their attitude toward reading.

McDowell (1964) reported slight gains for the experimental group who used Controlled Readers. The study, carried out in Ashland, Oregon, showed that the control group gained 0.90 percent, while the experimental group gained 1.05 percent. Dalton, Gleissman, Guthrie, and Rees (1966) showed that significant gains were obtained through the use of the Controlled Reader. Braam and Berger (1968), in an experiment with college students over a seventeen-week period, found that significant gains were made using the Controlled Reader.

One of the more scientific and comprehensive studies was carried out by Gelzer and Santore (1968). The investigators used 159 subjects, divided into five experimental groups, to compare five methods of improving reading. The experiment was carried out in October and November, 1961. The subjects were retested in February, 1962, and 114 of the subjects were retested in January, 1963. The researchers found that the greatest gains in rate and comprehension, as well as the greatest decrease in the number of fixations, occurred with the Controlled Reader (guided slot). The authors concluded:

"For a comparison of the various measures of reading performance of the five groups, it can be concluded that the gains made by the group trained with the Controlled Reader (guided slot) were superior to those achieved through the use of the other methods, if one considers permanence of gain a paramount consideration. The marked superiority in performance skills of the Controlled Reader (guided slot) group over all the other experimental groups might explain, in part, their superior retention and increase in rate and comprehension over the eleven-month period."

VOCABULARY AND SYNTAX

The large number of students who attended the Reading Laboratory during the course of this study made it impossible for the investigator to carry out individual reading diagnosis to establish the exact causes of reading disabilities; however, from observation of student reading habits and from previous studies, the investigator decided to concentrate his efforts in the area of vocabulary building and the study of syntax.

Studies by Davis (1944) have confirmed the importance of vocabulary training. He determined that accuracy of comprehension is more dependent on the ability to associate word meanings correctly than on any other mental activity. A later study by Davis (1968) confirmed "memory for word meanings" is the key factor in the comprehension of twelfth grade students in particular.

The concept of "syntax before semantics" is widely accepted and universally acclaimed. It is supported by such prominent writers as Joos (1966), Cronin (1965), Lefevre (1961), and Bryant (1965).

Empirical research by Hughes (1959), Marks and Miller (1964), Coleman (1965), Amble (1966), Williams (1968), Weimer and Cromer (1970), Fagan (1971), Forster and Ryder (1971), Weinstein and Rabinovitch (1971) seems to indicate that the knowledge of the structure of English sentences facilitates comprehension as much as any other factor. The Weimer and Cromer study (1970) is especially relevant since their conclusions are applicable to slow readers with poor comprehension skills.

Chapter 3

METHODOLOGY

INTRODUCTION

The study of the EDL Controlled reader which the investigator carried out concurrently with the evaluation of the reading program, though related to it, will be considered as a separate entity, and, as such, will be reported apart from it. While the Controlled Reader was one of the three components of the reading program, and while the subjects' reading exercises with the Controlled Reader were used in all the calculations of the study, the comparison of the subjects' reading scores with, and without, the Controlled Reader was not an integral part of the study, and the findings did not bear directly on the results of the evaluation. It has, therefore, been assigned to Chapter 5.

PRETESTING

The Administration of the Tests. Immediately after registration, each entrant was pretested by the investigator, who administered the TABE Reading Test, the Raven Matrices IQ Test, the RFU and SRA Placement Tests, the Estes Test of Attitude Toward Reading, and an EDL Efficiency Check. Generally, one and one-half to two days were allocated for pretesting. When the investigator had compiled the results of all the tests, the information was written on individual cards and filed alphabetically. Each student's starting point in the program was determined by the test results.

The Department Head, the Guidance Counsellor, and the other instructors were made aware of the pretest results. The investigator made periodic checks with his colleagues to verify the results of the tests, as well as to ascertain information about each entrant's study habits, workmanship, dedication, enthusiasm and attitude. Frequent consultations were made with the Department Head regarding academic achievement.

THE INSTRUMENTS

The Test of Adult Basic Education (TABE). The TABE Reading Test was used by the investigator to establish reading levels because it had been accepted by BTSD programs in Newfoundland and other provinces, and because an adequate supply had been purchased by the College and had been used extensively prior to the commencement of this study.

The test has two forms on three levels, and is, therefore, suitable for testing students whose reading levels vary greatly, as well as for experimental purposes. Also included is a Locator Test containing fifty vacabulary exercises to be used to acquaint students with test-taking procedures. It is relatively easy to administer individually, or in groups, and it can be scored either by hand or machine. One answer key serves both forms. Raw scores are easily converted into grade scores by the use of a table in the manual.

The TABE Reading Test also includes a student profile sheet which presents grade scores at 0.1 grade intervals from Grade II to Grade XIV. On the reverse side of the profile sheet is an analysis of the reading difficulties encountered by the student taking the test. The student's incorrect responses can easily be found by super-

imposing the correct stencil over the student's answer sheet. The results can be used for diagnostic, corrective, and remedial purposes.

The TABE Reading Test consists of one hundred and twenty items divided into two main sections. Fifty items (finding opposites) deal with the meaning of words of a mathematical, scientific, and social nature. The remaining seventy items are comprehensive. Students are asked to follow directions, to find information on maps and graphs, and to answer questions based on reading selections.

The TABE is actually a repackaging of the 1963 edition of the California Achievement Test with a few changes in vocabulary and design to make it more acceptable to adult populations. The publishers claim that validity and reliability are inherited from the California Achievement Test. No statistics relating to norms or reliability coefficients have been published. The California Achievement Test (CAT) is so widely known and widely accepted by educators that a detailed review is not considered necessary here. Accounts of this test have appeared in every edition of Buros' Mental Measurement Yearbook since 1933.

The latest edition of CAT (1963) on which TABE is based, was normed on the test results of 15,351 students in forty-nine states of the United States of America. The reported reliability (found by applying the Spearman-Bowman formula) ranged between .95 and .98.

<u>The Estes' Test of Attitude Toward Reading.</u> This test, also previously purchased and used at the College, was selected by the investigator to measure the attitude of each entrant. The construct and content validity had been well established. (Estes and Johnson, 1973). It can be administered in less than ten minutes individually

or in groups, and the scores can be easily converted into percentages which can be used for establishing percentiles and for statistical analysis of pretest and posttest results.

The Raven Matrices. These tests had been purchased by, and used at, the College of Fisheries since 1963. The investigator was well acquainted with the test, having used it during the past decade.

The Raven Matrices were normed on the test results of 1,407 children and 3,665 British soldiers. It is easy to administer, requires little verbal instruction, is simple to score and convert to percentiles and intelligence quotients. It is probable that what is measured by this test, which is completely non-verbal, relates more directly to natural abstract intelligence and less to academic achievement, educational opportunity, or cultural background. Reliability coefficients range from .72 to .91.

The RFU and SRA Placement Tests. These tests, which are included in the kits, had been used by the investigator for more than a decade with thousands of students as guides or indicators of their starting reading levels. They are quickly converted to starting points by using the accompanying manual. The investigator has found that the results of these placement tests supplement the results of the other tests and are fairly reliable indicators of the student's reading level as it pertains to the reading kits.

The EDL Efficiency Check. This test was administered to each entrant to establish his reading index before his introduction to the Controlled Reader. The Efficiency Check is a written reading exercise correlated with the reading material which is used with the Controlled

Reader. This Efficiency Check index, i.e., the product of reading rate and comprehension score, was the bench mark or starting point from which the comparisons of all other Efficiency Check indexes were made.

THE PROGRAM

The reading program consisted of daily classes in the Reading Laboratory during which the subjects took part in individualized, sequentially developed, and highly organized reading exercises. For purposes of this study, the investigator selected three components, EDL Controlled Readers, SRA, and RFU reading kits. While many other components had been used in the Reading Laboratory prior to the start of this study, the investigator eliminated all but these three on the basis that additional components would bring to the study many uncontrollable variables which would have made evaluation difficult, if not impossible. These three components were selected for the following reasons:

1. Each is designed for individualized instruction.
2. Each is scientifically and sequentially developed. Students progress to more difficult areas and encounter a wider range of reading skills.
3. Students are relatively easily motivated to use each component. Student success is recorded graphically as well as numerically. There is instant feedback and reward.
4. The materials are easily accessible, simple to use, and self correcting. With over two hundred students in daily attendance, these are important factors.

5. The reading selections, totalling over 6,000, cover a wide range of interesting topics.
6. Two of the components, the EDL 300 Series, and the SRA III B reading kit, were especailly designed for adults.
7. The combination of these three components covers a comprehensive list of reading skills. Included are identification, recognition, and association of printed symbols and meaning; binocular coordination and motility; structural and phonetic analysis; recall, understanding, and organizing; concluding, comparing, predicting, sensing and visualizing.
8. There is an abundance of reading material suitable for students whose reading levels range from Grade IV to Grade XI.
9. The arrangement of the reading skills to be learned, especially in comprehension, follows a well accepted hierarchy: recognition, recall, organization, inference, evaluation and appreciation.
10. All three components are universally known and accepted in the reading field.

The investigator was satisfied that these three components contained a sufficiently wide variety of reading material to meet the needs of the subjects of this study, notwithstanding their many deficiencies in reading skills. Table 1 outlines the areas of instruction, the reading skills and the source of instruction.

THE INSTRUMENTS

The EDL Controlled Reader is a mechanical device which projects words on a screen at a controlled rate. Two methods of projecting the words are available: full line and guided slot.

TABLE 1

OUTLINE OF AREA OF INSTRUCTION, READING SKILLS, AND SOURCE OF INFORMATION

Area of Instruction	Reading Skills	Source of Information
1. Perceptual Skills	Identification, recognition and association of printed symbols and meaning.	EDL Controlled Reader, RFU, SRA
2. Visual Functioning	Binocular Coordination and Motility	Controlled Reader
3. Word Knowledge	Word Meaning in Contextual Setting	Controlled Reader, SRA
4. Word Attack Skills	Structural and Phonetic Analysis	Controlled Reader, SRA
5. Comprehension Fundamentals	Recall, understanding, organizing	Controlled Reader SRA, RFU
6. Interpretation	Concluding, comparing, predicting, sensing, visualizing	Controlled Reader, SRA, RFU
7. Analytical Reading	Minute detail, overall structure	Controlled Reader, SRA, RFU
8. Critical Reading	Relevancy, accuracy, validity, significance	Controlled Reader, SRA
9. Reference Skills	Location of Information	SRA
10. Selective Reading	Skimming, Scanning	Controlled Reader, SRA

With the full line method, a line of print appears on the screen all at once for a predetermined time, after which another line takes its place. With the guided slot method, a scanner moves from left to right allowing only an "eye-span" of words to appear at a time. All other words are occluded. The rate at which the scanner moves is "controlled." During the study, the subjects used the guided slot method except when their speeds exceeded 450 words per minute.

The EDL Controlled Reader is capable of projecting words at speeds ranging from 75 to 630 words per minutes. Seven sets of twenty-five films each, coded DA, EA, FA, GA, HA, IJ and KL, were used by the subjects of this study. The DA series is below Grade IV reading level while the KL series is above Grade XI. Eight EDL Controlled Readers were available in the Reading Laboratory during the study.

The SRA III B Reading Kit was chosen for this study because of the suitability of the reading materials which are especially prepared for adult readers. The reading content is sequentially graded according to various colors from below Grade V reading level to college level. The kit is divided into two sections: Rate Builders and Power Builders. The Rate Builders contain short reading selections and comprehensive questions; and although they get progressively more difficult, each must be completed in three minutes. Thus, the reader learns to achieve more in the same length of time. The Power Builders are not timed, but students' times are recorded for both reading and comprehension. Also recorded are comprehension scores, and the combination of both scores serves as a guide for promotion. During the study, subjects completed bar graphs to show comprehensive scores and line graphs for time in the color appropriate to the color of the

kit in which they were working. Instant evaluation was thus possible.

Together, both sections contain three hundred reading selections and approximately one thousand questions sequentially graded according to type and difficulty. The Reading Laboratory provided three SRA reading kits for the study.

The RFU Reading Kit contains four thousand paragraphs, all of which are sequentially graded according to reading difficulty. In each case, the final word, phrase or clause is omitted from the paragraph, and the student has to choose the correct response from the four given choices. Eight RFU kits were available during the study.

PROCEDURES

Six classes of thirty-five students attended a daily scheduled reading class in the Reading Laboratory. On Monday, Wednesday and Friday, the EDL Controlled Readers and the RFU reading kits were used, and on Tuesday and Thursday, the SRA reading kits.

At the beginning of the study, criteria were established for advancement in each of the three components. Three consecutive scores of 100 percent in comprehension allowed subjects to advance to a more difficult section of the SRA reading kit; however, the investigator demanded that all subjects complete all the Rate Builders (sixteen in each color) in the most difficult areas. Three consecutive scores of 100 percent in comprehension permitted subjects to increase speed by 25 words per minute on the EDL Controlled Reader. While they were permitted to continue reading at the speed of their choice, no subject was ever requested or coerced to increase speed. The directions for using the RFU reading kit, as given in the accompanying manual, were

closely followed; subjects advanced to a higher reading level when they demonstrated mastery of the level at which they were reading. Subjects were requested not to guess the answers or to arrive at the correct response by an elimination process; rather they were advised to use a dictionary or to ask the instructor for clarification of difficult passages.

Generally, all subjects started at the lowest levels of all three components and advanced at different rates through the reading selections. For numerous reasons, each subject completed a different number of reading selections, and it is that difference which formed the basis for the design of this evaluative study.

Chapter 4

DESIGN AND ANALYSIS

DESIGN

The nature of the individualized prescribed instruction program which was used with the subjects of this study did not allow the investigator to design a study with experimental and control groups. Since the subjects entered the program whenever vacancies occurred, their dates of graduation varied according to their academic ability, motivation or required goal. Thus, both the duration of the course and the entry and completion dates differed with each student. Also, the unavailability of time, space, instructional personnel and materials, and finances rendered the introduction of an alternate course of study impossible.

As an alternative, the investigator designed this study to compare the reading gain of those subjects who completed a maximum number of reading selections in the Reading Laboratory with that of those who completed a medium number and a minimun number. The investigator reasoned that those subjects who completed the largest number of reading selections would be influenced more than those who completed the smallest, and thus valid comparisons could be made. Accordingly, for convenience, the investigator, at the completion of the study, divided the subjects into three groups so that each would have fairly equal populations and so that no group would have fewer than thirty subjects. Group 1 (Low) contained those subjects who had completed fewer than 200 reading selections; Group 2 (Medium), those who had completed between 200 and 300 reading selections; and Group 3 (High), those who had completed more than 300 reading selections.

It should be recognized, of course, that since the investigator had no control over assignment of subjects to groups, comparisons between the groups are of a correlational rather than an experimental nature. That is, while it is possible to determine whether or not the groups are different with respect to a particular dependent variable, it is not possible to say that any such differences were caused by the differences in the number of readings, but only that they are associated with differences in the number of readings.

Besides the two factors mentioned above, the Low group limit was set at fewer than 200 reading selections because that figure generally represented selections which were below Grade VI reading level. These subjects would not have been greatly influenced by their attendance in the Reading Laboratory since their reading experiences would have been confined to orientation and practice exercises. Table 2 below shows the group populations.

TABLE 2

DIVISION OF SUBJECTS BY GROUP

	Group I (Low)	Group II (Medium)	Group III (High)
Male	12	18	28
Female	21	20	21
Total	33	38	49

The mean and standard deviation for the number of selections completed by each group were calculated. The results, given in Table 3, show that the average number of reading selections completed by each group differed by approximately 100, and that the groups were equally divided according to the mean difference. The table also points out that the average number of selections completed by the control group was 158, which indicates that the influence of the Reading Laboratory was minimal. The wide range in the number of completed selections is demonstrated by the large standard deviations. The distribution of the reading scores is shown in Figure 1 on Page 33.

TABLE 3

MEAN AND STANDARD DEVIATION OF THE NUMBER OF COMPLETED READING SELECTIONS

	Group I		Group II		Group III	
	Mean	Sd.	Mean	Sd.	Mean	Sd.
Male	162	40	255	36	355	43
Female	153	29	245	46	345	46
Total	158		252		350	
Range	68 - 199		200-299		300-448	

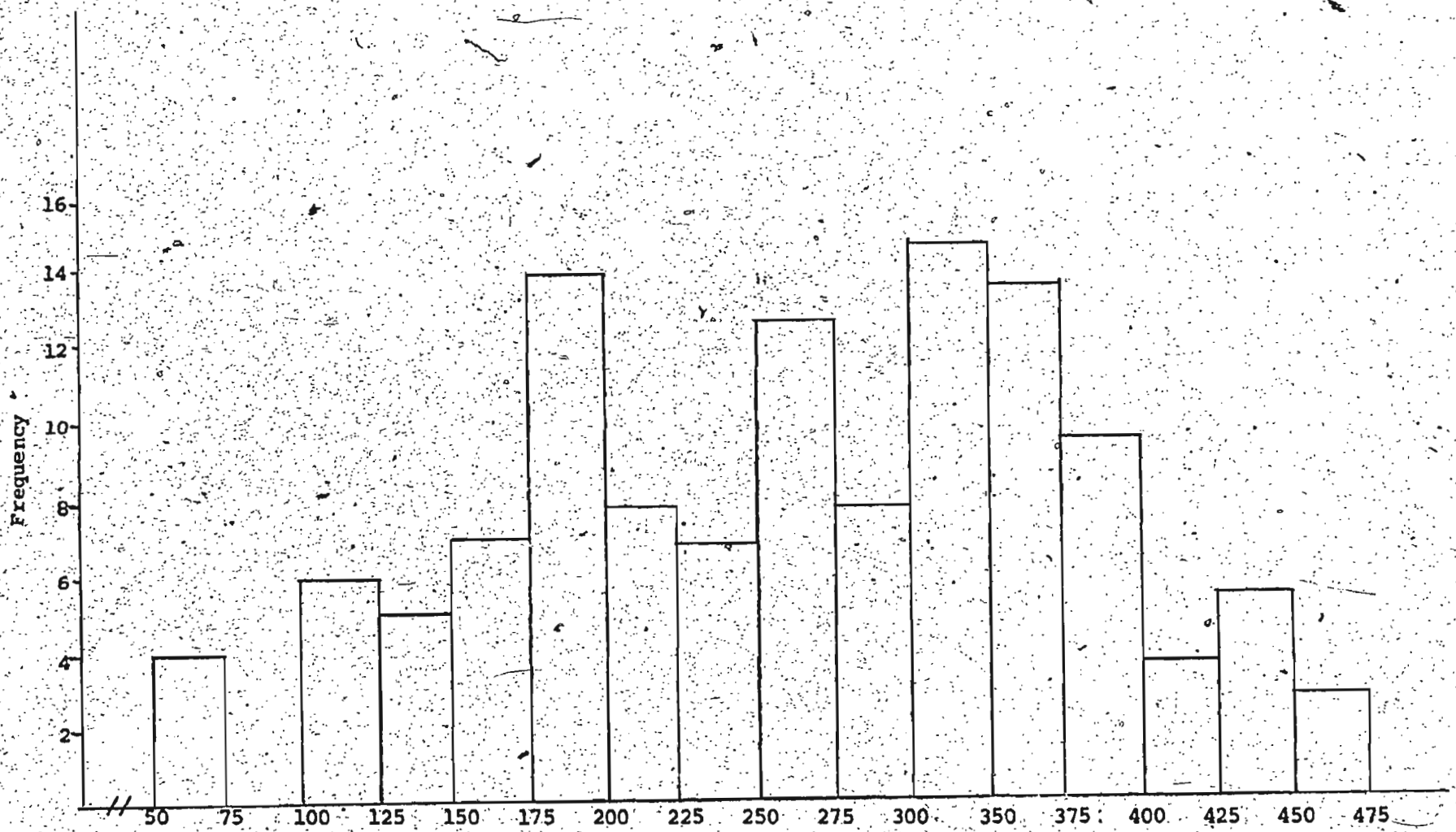


FIGURE 1

NO. OF COMPLETED SELECTIONS

HISTOGRAM OF READING SELECTIONS

Table 4 gives the IQ profile of the subjects by group. The distribution of the scores is shown in Figure 2 on page 35.

TABLE 4

IQ PROFILE OF SUBJECTS BY GROUP

	Group I		Group II		Group III	
	Mean	Sd.	Mean	Sd.	Mean	Sd.
Male	104	12	105	15	108	12
Female	108	10	102	12	105	11
Group	106	11	104	13	106	12

At the completion of their BTSD program, all students were evaluated in mathematics, English and science, and were given a rating of A, B, C, or D. An "A" rating indicated that the student had surpassed the performance score (85 percent) in all units attempted, had shown a high degree of initiative, had worked with a minimum of supervision, and had adapted to problem situations considerably above average. The "B", "C", and "D" ratings indicated progressively less student initiative, and a greater need for supervision, direction, and assistance by their instructors.

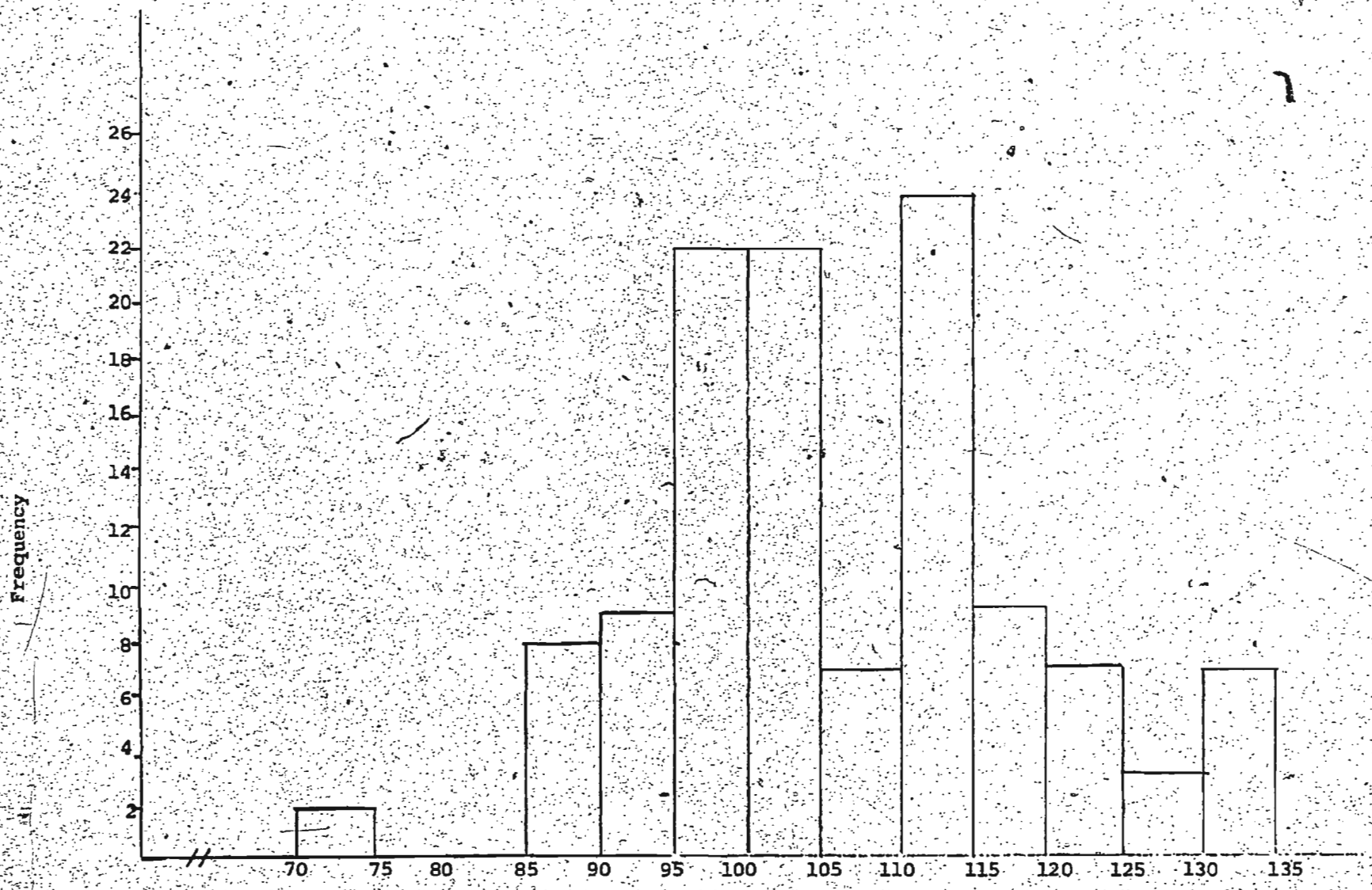


FIGURE 2

I Q RANGE

HISTOGRAM OF IQ SCORES

For the purpose of this study, the investigator, in collaboration with the Head of the Academic Department, averaged each student's scores in mathematics, science and English, and converted them to a numerical scale. The means and standard deviations are given in Table 5.

The procedure by which the scores were obtained, that is, the averaging of the scores over three subjects before numerical conversion, may account for the homogeneity of the final score. The mean achievement scores recorded in Table 5 when subjected to Analysis of Variance showed no significant difference. ($F = 0.74$, $df = 2, 117$, $P = 0.93$)

TABLE 5

ACADEMIC ACHIEVEMENT PROFILE OF SUBJECTS BY GROUP

	Group I		Group II		Group III	
	Mean	Sd.	Mean	Sd.	Mean	Sd.
Male	4.66	2.12	3.73	2.05	4.60	2.13
Female	5.14	2.37	5.30	2.26	5.30	2.22
Group	4.97	2.29	4.63	2.16	5.10	2.17

RESULTS

Attitude was calculated by subtracting the pretest scores from the posttest scores of the Estes' Test of Attitude Toward Reading. The means, differences, and standard deviations are given in Table 6. Figure 3, Page 38 shows the distribution of subjects' attitude scores.

The average posttest score for the Low group was 75, whereas the average posttest score for the High group was 84. The results also showed greater difference between the pre and post tests according to group. The Low group showed a negligible difference of -.02 whereas the High group showed a positive gain of 3.6. When these scores were subjected to Analysis of Variance, however, the results showed no significant difference. ($F = 1.97$, $df = 2, 117$, $P = .14$)

The element of statistical regression cannot be overlooked in this section of the study. On the pretest, forty-five subjects (37.5 percent) scored over 80 and ten subjects scored above 90. It was highly unlikely that these scores could be improved on the posttest. One subject scored 99 on the pretest and 96 on the posttest. Although the scores were extremely high, the subject showed a negative attitude score, whereas, in fact, this posttest score was the highest recorded among all the subjects of this study.

TABLE 6

ATTITUDE PROFILE OF SUBJECTS BY GROUP

	Group I			Group II			Group III		
	Means			Means			Means		
	Pre	Post	Diff.	Pre	Post	Diff	Pre	Post	Diff
Male	74.8	76.5	1.7	77.2	77.7	0.5	80.1	83.9	3.8
Female	75.0	74.0	-1.0	78.0	79.7	1.7	80.7	84.1	3.4
Group			-0.02			1.1			3.6

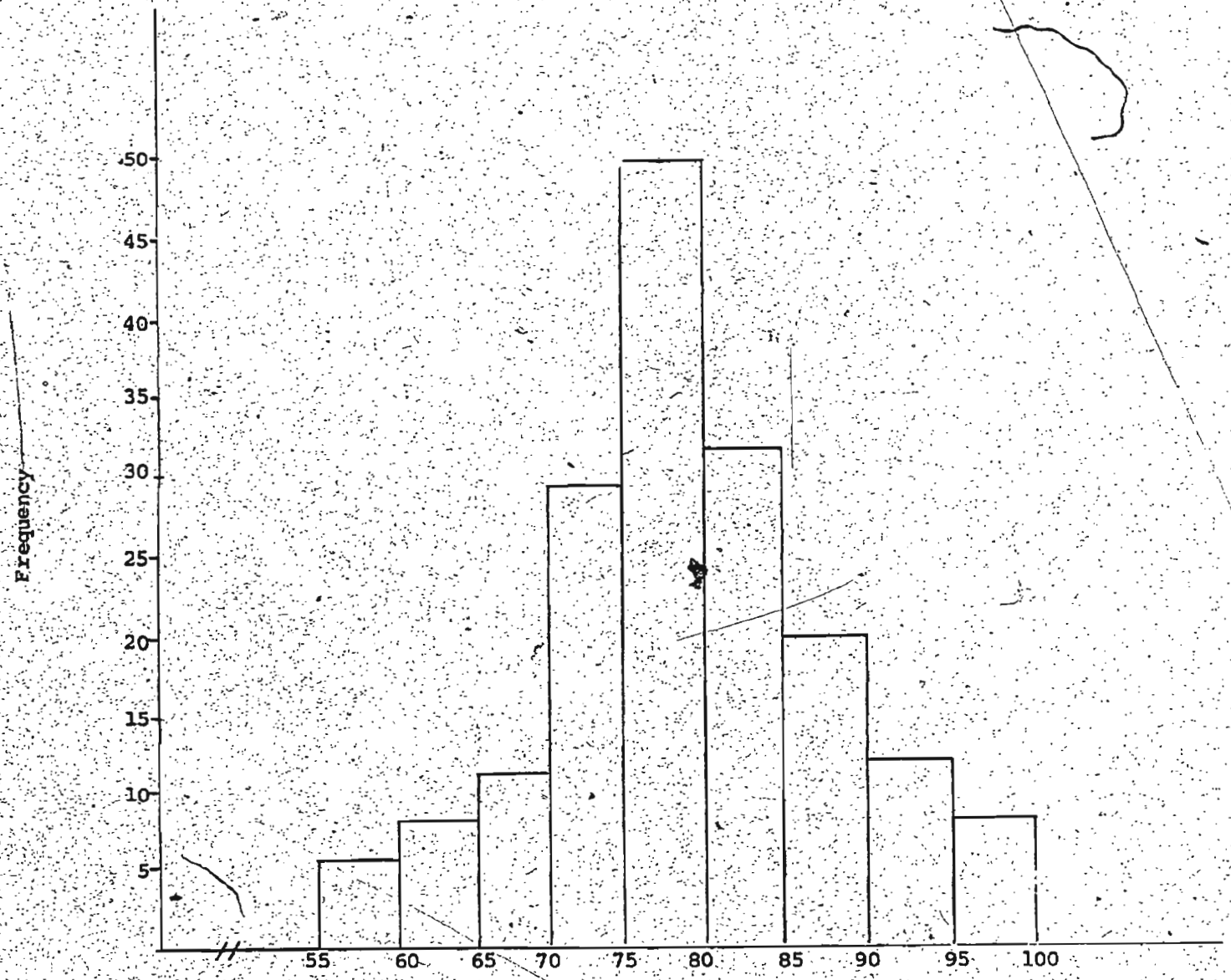


FIGURE 3

ATTITUDE RANGE

HISTOGRAM OF ATTITUDE SCORES

RELATIONSHIP BETWEEN NUMBER OF COMPLETED READINGS AND READING GAIN

Having neither control nor experimental group, the investigator designed the study to determine the significance of the reading gain scores of the three groups. This was accomplished by calculating a series of correlation coefficients with reading gain as the dependent variable and IQ, Sex, Academic Achievement, Attitude, and number of completed Selections as independent variables. The data were computerized and the results are shown as a correlational matrix in Table 7. The distribution of reading gain scores is shown in Figure 4, while the pre-test and posttest reading grade scores are given in Figure 5.

The matrix confirmed that significant correlations existed between the dependent variable and three of the independent variables. Reading gain correlated highest (.567) with the number of completed reading selections, followed by Academic Achievement (.272) and Attitude (.289). The matrix also indicated significant correlations among the independent variables with the exception of the IQ which correlated significantly only with Academic Achievement. Attitude, Academic Achievement and Selections correlated significantly with one another.

The importance of the relatively high correlation between reading gain and the number of completed reading selections cannot be overstated. It is, without doubt, the most significant finding of the entire study. It confirms that a large number of reading selections must be completed before a substantial reading gain becomes evident, and conversely, that reading gain will occur after numerous

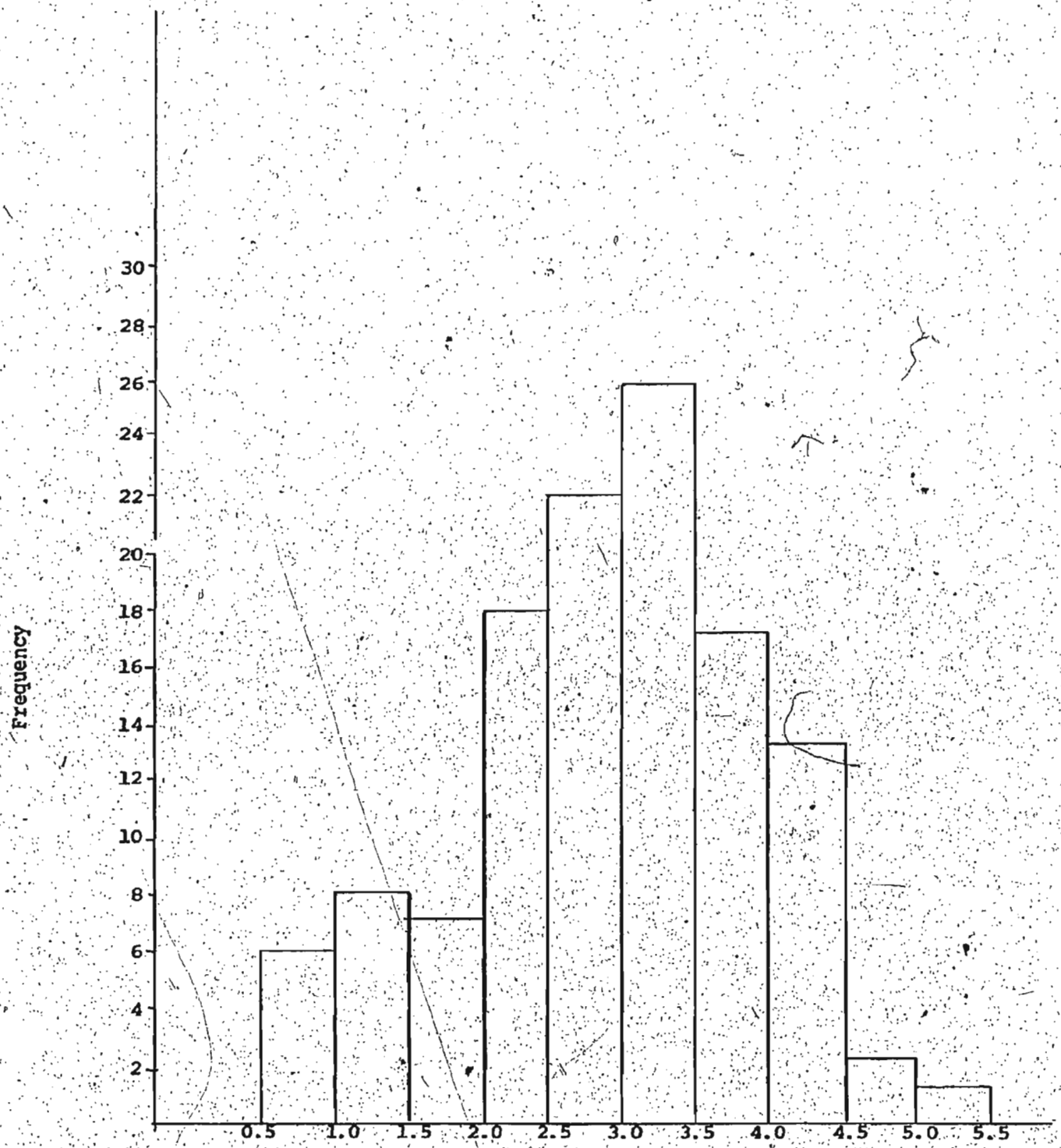


FIGURE 4

READING GAIN SCORES

HISTOGRAM OF READING GAIN

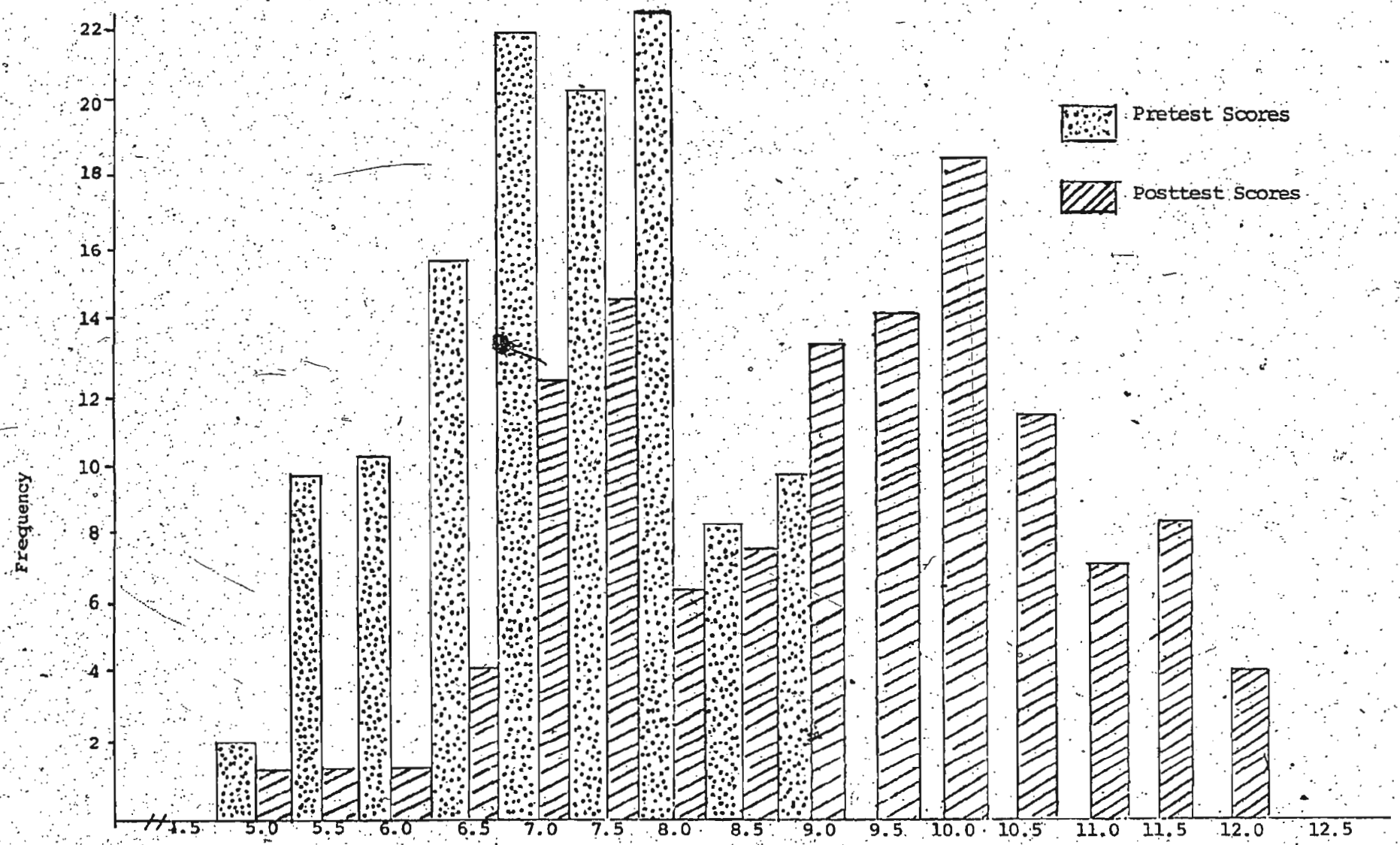


FIGURE 5

PRETEST AND POSTTEST READING GRADE SCORES

HISTOGRAM OF PRETEST AND POSTTEST READING SCORES

reading selections have been completed. Also pointed out is the necessity of regular attendance in the Reading Laboratory to ensure that the required number of readings is completed so that reading levels are raised sufficiently to enable students to cope with the BTSD program.

TABLE 7

CORRELATION MATRIX

	IQ	Acd.Ach.	Select	Att.	Gain
IQ	-	.335	-.06	.128	.164
Acd. Ach.	.335*	-	.270*	.242*	.272*
Select	-.063	0.270*	-	.267*	.567*
Att.	.128	.242*	.267*	-	.289*
Gain	.164	.272*	.567*	.289*	-

* Significant at $\alpha = 0.05$

The correlation matrix showed a significant relationship between the dependent variable (reading gain) and three of the independent variables. On the basis of these findings, the investigator proceeded with Multiple Regression Analysis. The purpose of this statistical exercise was to determine the extent to which the dependent variable could be predicted from the independent variables. The Multiple Regression Analysis was carried out by means of a previously written computer program, and the summary of the analysis is given in Table 8. The summary indicated that the best predictor of this study was

Selections, followed in order by Academic Achievement, IQ, Attitude, and Sex.

From the printout the following multiple regression equation was obtained:

$$Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5$$

where Y represents reading gain; b_0, b_1, b_2, b_3, b_4, and b_5 represent constants; and x_1, x_2, x_3, x_4, and x_5 represent Selections, Academic Achievement, IQ, Attitude and Sex, respectively. Having determined the constants, the investigator, by assigning known numerical values to the x's, can predict the reading gain of the entrants to the BTSD program.

The ability to predict reading gain, however, is not essentially important either to the entrant, the reading instructor, or the Head of the Academic Department. What is of much greater importance to all concerned is the prior knowledge of the number of reading selections which each entrant must complete if he is to achieve the required reading gain to ensure academic success. Assuming the minimum academic goal of each entrant to be a "D" rating, the reading instructor can, by making use of the pretest scores, determine this information by solving the multiple regression equation. It should be borne in mind, however, that in a correlational study such as this one only averages are being discussed, and it is not to be construed that an instructor can determine beforehand the exact number of readings that any particular student must complete in order to attain a certain grade.

TABLE 8

MULTIPLE REGRESSION ANALYSIS

SUMMARY TABLE

Variable	R. Square	RSQ Change	Beta	F	Signif of F
Group	0.32175	0.32175	0.00617	55.854	.001
Acd. Ach.	0.40216	0.08042	0.09539	7.072	.01
IQ	0.41376	0.01160	0.00906	2.177	NS
Att.	0.41957	0.00581	0.00971	1.147	NS
Sex	0.42029	0.00072	-0.05576	0.141	NS

DEPENDENT VARIABLE: GAIN

The results of the study also seemed to suggest that there might be an interaction between reading gain and sex. The mean reading gain of the male subjects in the Low group (1.42) was lower than that of the female subjects in the Low group (2.16), whereas the mean reading gain for male subjects in Group III (High) (3.1) was higher than that of the female subjects in that group (2.98). The results are given in Table 9.

TABLE 9

READING GAIN BY SEX GROUP

	Group I	Group II	Group III
Male	1.42	2.31	3.10
Female	2.16	2.30	2.98
Group	1.7	2.30	3.0

A 2-way analysis of variance was computed, and the results revealed that the supposed interaction was not significant at the .05 level. It was significant, however, at the .055 level, which would suggest that a further investigation be carried out. Table 10 shows the results of ANOVA.

TABLE 10

ANALYSIS OF VARIANCE

GAIN BY SEX GROUP

Source of Variation	Sum of Squares	DF	Mean Square	F	Signif. of F.
Sex	0.573	1	0.573	0.886	0.999
Group	36.969	2	18.485	28.592	0.001
Interaction	3,813	2	1.907	2.949	0.055
Residual	73.700	114	0.646		
Total	115.291	119	0.969		

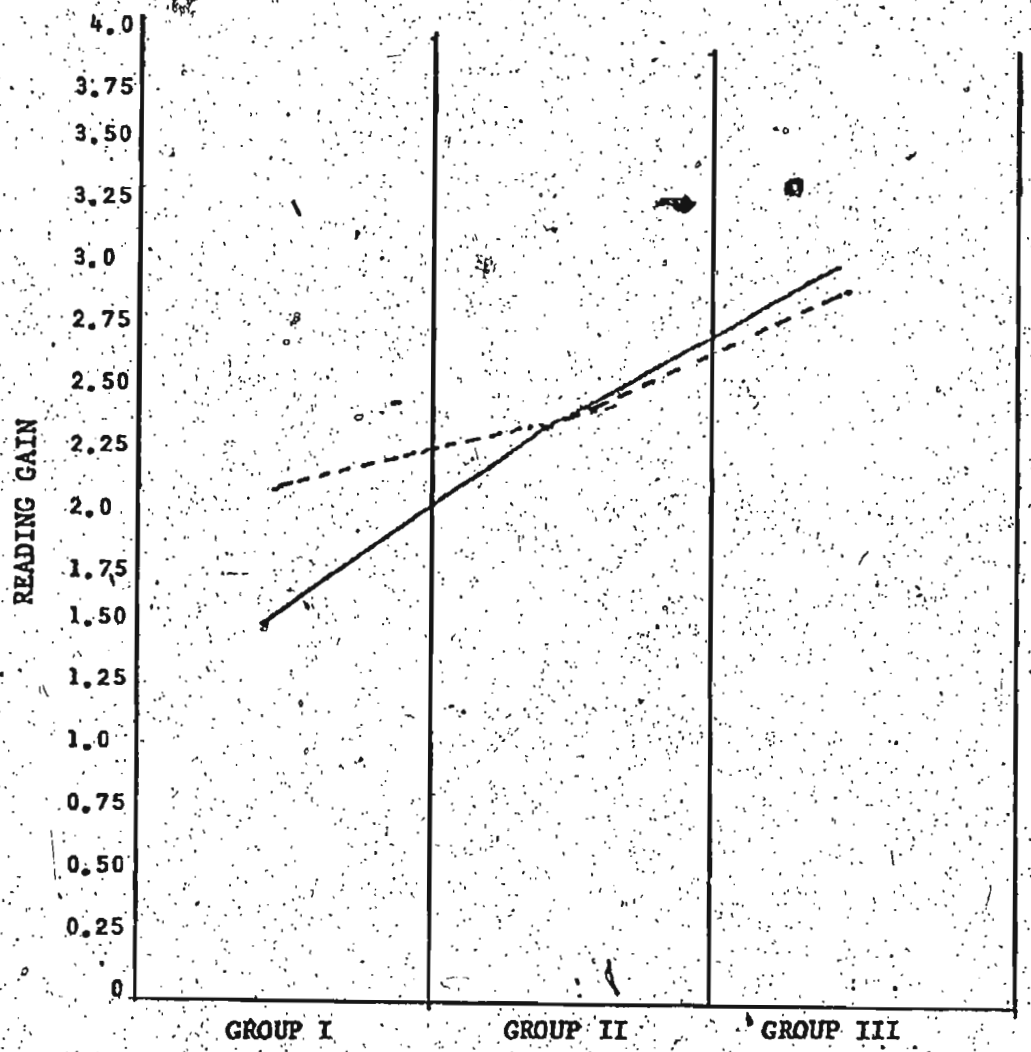


FIGURE 6

ANALYSIS OF VARIANCE BY SEX GROUP

Chapter 5

THE EDL CONTROLLED READER STUDY

INTRODUCTION

Educators in Newfoundland have realized for years that far too many students fail to complete high school. They are unanimous in agreeing that one of the major causes of student dropout is the low reading levels and lack of reading skills of large numbers of their students. Various aspects of education have been blamed, at one time or another, for students' relatively poor showing in reading: over-crowded classes, the lack of qualified reading instructors, the prescribed reading program, inadequate reading materials, and the Education Department of Memorial University. Many conscientious efforts have been, and are being, made to improve reading programs in Newfoundland schools. Many schools, for example, have turned to electronic reading devices such as Controlled Readers. To date, schools in St. John's, Grand Falls, Corner Brook, Deer Lake, Stephenville, as well as the nine vocational schools, the College of Fisheries, and the College of Trades and Technology, have purchased EDL Controlled Readers.

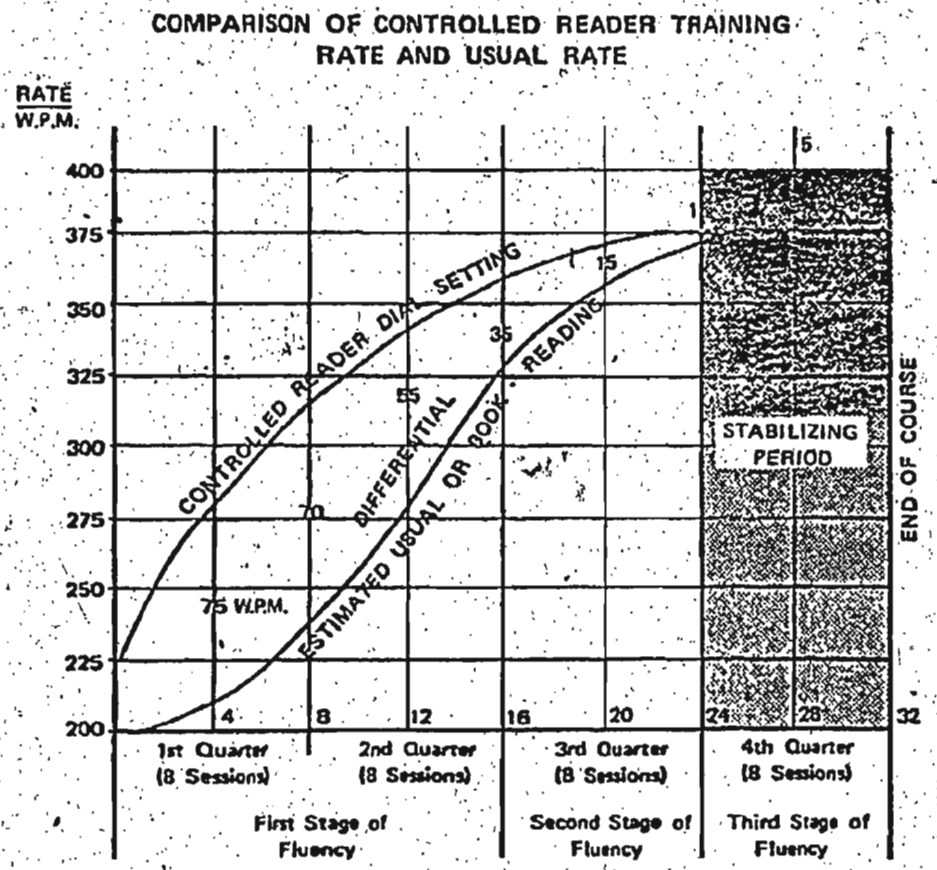
THE PURPOSE OF THE EXPERIMENT

The investigator was not aware of any study pertaining to Controlled Reading that had been carried out in Newfoundland; and as the cost of implementing and maintaining a Controlled Reading program is great, the investigator decided to make a special study of the EDL Controlled Reader using Newfoundland students as subjects. The investigation made no attempt to determine the extent to which the Controlled Reader was responsible for the reading gain which was achieved

during his study in the Reading Laboratory at the College of Fisheries. The purpose of the study was to make a comparison of the subjects' reading scores which were obtained from their using the Controlled Reader and their reading scores away from the Controlled Reader. The investigator wanted to measure the amount of achievement in reading efficiency which the subjects made as a result of their being exposed to EDL Controlled Reader.

Educational Developmental Laboratories of Huntington, New York, the manufacturers of EDL Controlled Readers, contend that a substantial difference in Controlled Reading rate and book reading rate exists only at the beginning of the reading program, for it is then that old reading habits are being used whereas new habits have not been formulated. (Taylor and Frackenpohl, 1968.) Furthermore, they contend that as long as the Controlled Reader rate is increased, the differential will be considerable; but eventually the students' bookreading rate will equal, or even surpass, the Controlled Reading rate. The equality of rates should be attained after twenty-four sessions and a stabilizing period should follow during which time the two reading rates would remain equal but no reading gain would be apparent. A chart on page seventy-six of the Teacher's Guide, published by Educational Developmental Laboratories, Inc. demonstrates this information. (See Figure 7 on Page 49.)

The investigator wished to compare the results of his subjects with those published by Educational Developmental Laboratories, as well as to determine the results of extending the Controlled Reading program further than the thirty-two session period advocated by the manufacturers of the EDL Controlled Readers.



(From Controlled Reading Teacher's Guide)

FIGURE 7

THE CONTROLLED READING PROGRAM

The Controlled Reading program consists of Controlled Readers, film strips, Student Study Guides and Efficiency Check booklets. A brief explanation of each is given below.

The Controlled Reader

The Controlled Reader is a mechanical device which projects words on a screen. A film strip, specially prepared, is threaded through the machine in a method similar to threading a movie projector. A speed dial "controls" the speed at which the words are projected. The source of lighting is a 500 watt light bulb.

There are two methods of projecting the words onto the screen: the full line method projects five to seven words at a time, after which another line is projected in its place at controlled intervals. Students prefer this method of projection because it allows them to continue to use their old reading habits; however, the research studies which the investigator reviewed show this method to be inferior to the guided slot method.

The guided slot method is a left-to-right projection of an "eye-span" of words at a time. The words immediately before and after the projected words are occluded by means of a moving scanner. The rate at which the scanner moves is "controlled" by the speed dial. Research has shown that this method has produced the best results in modifying poor visual-functional and perceptual habits. During this experiment the guided slot method was used almost exclusively, the only exception being when students exceeded 450 words per minute.

The EDL Film Strips

The EDL film strips are arranged in sets of twenty-five each and are coded DA, EA, FA, GA, HA, IJ, and KL. In all, there are 175 film strips containing stories which range in reading difficulty from below Grade V level to College level. (Other film strips are available from EDL but they were not used during this study).

The Student Study Work Guides

The Student Study Work Guides are books which contain the same stories as are found on the film strips. For example, the FA Student Study Work Guide contains the stories that are found on the FA set of film strips. In addition to the stories, the Work Guides contain vocabulary exercises for each story, ten comprehension questions to be completed after each story is read with the Controlled Reader, and a graph on which is plotted the results of the comprehension questions.

Before the story is read with the Controlled Reader, each student must perform certain preview exercises: he must study the title, the author, and the accompanying picture, answer a question based on the preview, read pertinent sentences or paragraphs, and complete the vocabulary exercises. The story is not read from the Study Guide, but the student may reread the story from the book after the reading session is completed.

Having completed the preview exercises, the student reads the story with the Controlled Reader at a predetermined speed. He then completes the ten comprehension questions which are found at the end of the story in the Study Guide. When the comprehension questions have been answered and checked, he plots on the graph in the Study Guide, his

reading rate, his comprehension score and the index. The index is the product of reading rate and comprehension score, and it is a more meaningful indication of student progress than either reading rate or comprehension scores taken separately. (Tinker, 1932.)

The Efficiency Checks

The Efficiency Checks are booklets published by EDL and are used to appraise student progress in reading away from the Controlled Reader. Each of the seven booklets contains five stories. They are coded like the film strips and are correlated with them. They are designed to be used after every fifth film. For example, the Reading Efficiency Check FA should be used after the fifth, tenth, fifteenth, twentieth, and twenty-fifth of set FA.

PROCEDURE

When each subject had completed twenty-five stories with the Controlled Reader, i.e., when he had finished one Study Guide, the graph showing his record was removed from the Study Guide. The investigator summed the indexes in groups of five and found the average. Thus, each graph yielded five mean scores. This procedure was repeated each time a subject completed another Study Guide. All the graphs were filed and all mean scores were recorded.

At the completion of the study, all the mean index scores of the 120 subjects for the first five stories were summed and averaged. The resulting figure, i.e., the mean of all the means, was recorded. Similarly, the mean of all the means of all the subjects was found for the second group of five stories, i.e., stories six to ten. This figure

was recorded. This procedure was repeated thirty-five times until all the means were compiled and recorded. The results are found in Figure 7 on page 54.

RESULTS

To elucidate the discussion of the results of this experiment, the investigator has divided the EDL Reading Program into seven phases or sections, each corresponding to a Study Guide. Thus, Phase I corresponds to DA Study Guide, phase II to EA, phase III to FA, and so on.

The mean index of the first five stories read by the 120 subjects with the Controlled Reader was 124. An extraordinarily large increase in reading efficiency was demonstrated by the subjects during the early part of the EDL reading program as the mean index rose to 208 by the twenty-fifth story (the end of Phase I), a gain of 84 points, or 68 percent. Continued growth at an exceedingly rapid rate was also experienced during the second phase (EA) of the program. The mean index at the fiftieth story had risen to 250, an increase of 126 points, or slightly more than 100 percent increase since the beginning of the program. Smaller gains were evident during the third phase. At the seventy-fifth story (end of FA) the mean index was 266. A stabilizing period occurred during the fourth phase (GA), and this was followed by a small, but significant, increase during the fifth phase (HA). The highest mean index, 280, was recorded at the one hundred twenty-fifth story. Thereafter, a decline is indicated; however, the number of students who completed phases VI and VII was too few to produce reliable data.

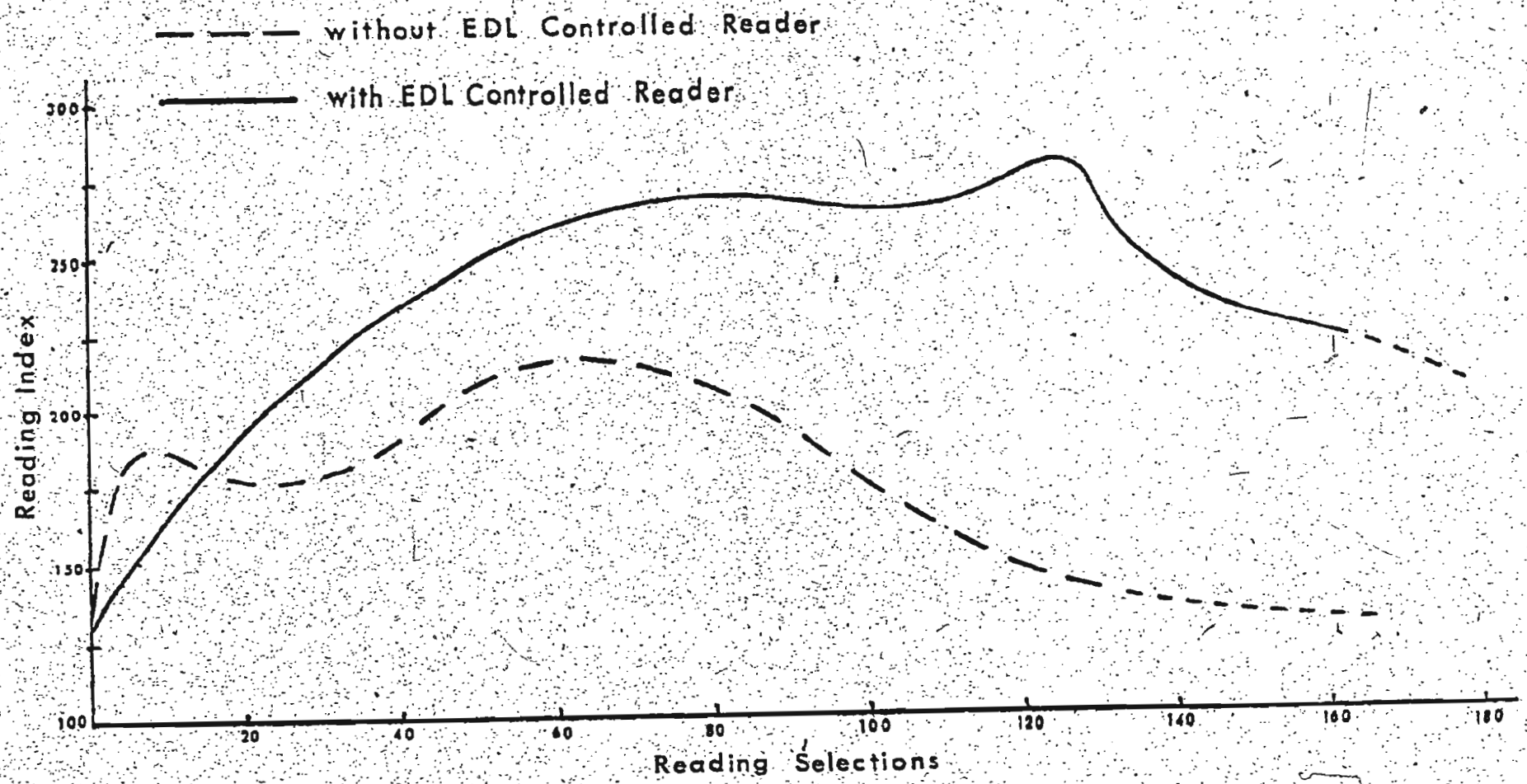


FIGURE 8

A COMPARISON OF READING INDEXES WITH AND WITHOUT THE EDL CONTROLLED READER

DISCUSSION

The results of the study demonstrate clearly that the subjects achieved phenomenal gains in reading efficiency during the early stages of the program. The almost identical scores of the subjects at the start of the program obtained both from the efficiency check and from the Controlled Reader graphs seem to suggest that a reliable measurement of the subjects' reading levels was made. The extremely rapid growth in reading gain suggested to the investigator that the reading levels of the material in the program might be low. Consequently, the investigator carried out a study of the stories in the seven Student Study Guides using the Fry Readability Formula as the instrument of measurement. It should be remembered that the stories in the Study Guides are the same as those on the film strips, and that the stories used for efficiency checks are correlated with the stories in the Study Guides. The results of the study, based on more than 100 paragraphs selected at random from the seven Study Guides, are given in the table below.

TABLE II

READING LEVELS OF SEVEN EDL STUDENT STUDY GUIDES

Student Study Guide	Reading Level
DA	Grade 2
EA	Grade 3 - 4
FA	Grade 3
GA	Grade 7
HA	Grade 8
IJ	Grade 9
KL	Grade 12

The relatively low reading level of the stories in DA, EA, and FA could possibly be the cause of the rapid growth in reading gain during the early stages of the program. The increase of four grade levels from FA to GA might also explain the cause of the subjects' scores remaining stationary or stabilizing during the fourth phase of the program. The slight rise in the fifth phase might possibly have resulted from the combination of the subjects' experience with the Controlled Reader - they had already viewed 100 films - and the relatively small increase in reading difficulty from GA to HA. Insufficient data were collected by the investigator to analyze meaningfully the subjects' scores in the last phases of the EDL program; the trend, however, seems to suggest a rapid decline.

The results of the experiment seem to contradict the research of EDL, Inc., as stated in the Teacher's Guide to Controlled Reading (Taylor and Frackenpohl, 1968). There it is stated that Controlled Reader reading speed and usual, or book-reading, speed would coincide at 375 w.p.m. The apparent difference could be attributed to the different methods employed during the research period. The investigator based his findings on the subjects' reading indexes (the products of reading rate and comprehension scores) while it is probable that the EDL, Inc. conclusions were based on reading rate alone. This experiment showed that the subjects' reading scores away from the Controlled Reader did not equal or surpass those attained with the Controlled Reader. Figure 7 shows that the scores obtained from reading away from the Controlled Reader remained an average of approximately fifty points below those obtained with the Controlled Reader.

Chapter 6

SUMMARY

This is a report of a seventy-three week study which was conducted between September, 1974, and January, 1976, in the Reading Laboratory of the College of Fisheries, in St. John's. The purpose of the study was the evaluation of the reading program which was provided for the upgrading students in the Basic Training for Skills Development (BTSD) program. The one hundred and twenty students who served as subjects for the study received daily reading instruction from the investigator. EDL Controlled Readers and two reading kits were used exclusively during the study. Each subject spent an average of thirty-six weeks in the program.

All subjects were pretested on the date of entry and post-tested prior to their leaving the program. All data compiled during the study were analyzed in a series of statistical exercises by the computer at Memorial University of Newfoundland.

The pretests showed that the mean reading level of the subjects at registration was 6.90. At the end of their program the mean reading level had risen to 9.34, a gain of 2.44 grades in the thirty-six week period. Fifty of the 120 subjects attained a Grade X reading level and nineteen reached or surpassed Grade XI. Fifty-seven of the subjects gained more than 2.5 grades, thirty-three gained over 3.0 grades, and three more than 4.0 grades.

Group one achieved the least gain - an average of 1.7 grades. Group two averaged a gain of 2.3 grades, while Group three, those subjects who completed more than 300 reading selections in the Reading Laboratory, recorded a mean gain of 3.1 grades.

The study of the EDL Controlled Reader, conducted at the same time by the investigator, showed that all subjects made substantial gains in speed and comprehension early in the program and continued to do so at a decelerated pace throughout the study.

The analysis of the data revealed that the reading program was marginally better for male students. The predominant finding of the study was that reading gain correlated highest with the number of selections completed by the subjects. The next highest correlation was between reading gain and academic achievement.

The investigator concluded that the reading program was capable of raising student reading levels sufficiently high to allow them to progress successfully in the BTSD program.

It is recommended that the Academic Department of the College of Fisheries continue to conduct studies in reading, particularly with upgrading and vocational students, since a growing emphasis in adult education is becoming more pronounced each year. Specifically, it is recommended that attention be given to the compilation of local norms and standard deviations of various testing instruments and to the continuance of evaluative studies of mechanical reading devices.

CONCLUSIONS

The following conclusions may be drawn as a result of this study:

1. The reading program which is provided for upgrading students in the BTSD program is capable of raising student reading levels sufficiently to allow them to progress satisfactorily through the program.
2. The reading program is slightly better for male students.
3. The best predictor of reading gain is the number of reading selections completed by students in the program.
4. The EDL Controlled Reader is capable of providing immediate growth in speed and comprehension.
5. The SRA reading kit does not contain a sufficient number of reading exercises to permit students to make successful advances in the more difficult sections.

RECOMMENDATIONS

The study leads the investigator to make the following recommendations:

1. That the basis of the reading program for BTSD students continue to be the three components as described in this study, and that other reading materials be introduced into the laboratory to meet the needs of those students who cannot benefit fully from the present program.
2. That this study be continued with an increased sample size to determine student reading scores with the IJ and KL reading series.

3. That additional series of EDL film strips be inserted after the HA set to enable students to cope with the more difficult readings.
4. That additional studies be commenced to determine the contribution of each of the three components of this study to the overall student reading gain. It is recommended that other reading materials be substituted for each of the three components, one at a time, until the study is completed.
5. That the BTSD science course be re-written, where necessary, to make it comparable with student reading levels.
6. That those students whose pretests indicate low reading levels be given extra reading instruction at the beginning of the course to enable them to make satisfactory progress.
7. That further studies be carried out to make comparisons between EDL Controlled Readers and other controlled readers which are available locally at a lower cost.
8. That a study be conducted to investigate the value of previewing the EDL reading lessons, and hence the necessity of purchasing Controlled Reading Study Guides.
9. That those students whose reading levels are extremely low have their reading classes scheduled around those classes which, from time to time, may cause interference and prevent them from completing the required number of reading selections.
10. That additional multi-level reading materials be purchased to supplement the SRA III B reading kit, especially in the more difficult sections.

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