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ABSTRACT

In this evaluation of the effectiveness of a developmental, individualized reading program in grades six, eight, nine, and eleven, emphasis was placed on diagnostic and prescriptive procedures within a laboratory setting. Interaction between students and teacher-counselors was on a one-to-one basis. The nine-week program included pretesting, individual planning conferences, six weeks of laboratory experience, posttesting and final evaluation conferences. The results showed reading rate gains to be significant at all four grade levels. Sixth graders gained 2.6 months in story comprehension and 4 months in paragraph comprehension. Gains in two sections at the other three levels were significant. Mean gains in vocabulary were significant in four of the ten sections at the four grade levels. Complete statistical data, a list of materials and equipment, cost analysis, and a workshop model are included in the appendices. (Author/TO)

PREFACE

In December, 1969, the Office of Academic Affairs of the State University System reported the results of a study by that Office of the roles of the four laboratory schools located at state universities. The conclusion of the study was that the central mission of the laboratory schools should become that of centers of research and high risk experimentation, sharply focused on the search for solutions to persistent problems in teaching and learning.

This shift in emphasis has produced extensive research and experimentation at P. K. Yonge Laboratory School during the past two years. Several projects have been completed or are presently being field tested in public schools. Others are at various stages of planning or implementation. As rapidly as these projects are completed, comprehensive reports will be made available to personnel in the state's public schools who are responsible for the areas of education represented by the projects.

It is fitting that this first report describes a procedure for the improvement of reading at the middle and secondary school levels. Certainly, there has been no more persistent problem in teaching and learning than that of continuing to enhance pupils' reading proficiency as they advance through the elementary and secondary school grades.

Another project which has been completed, and will be reported soon, attacks the problem of integrating a large number of blacks into a predominantly white high school. A unified science curriculum, developed at the Laboratory School, consolidates the concepts and skills of physics, chemistry, and biology into a three-year, interdisciplinary program. Individualized chemistry and physics programs have been developed and field tested in a number of public schools, and an individualized biology program will be ready for field testing in 1972-1973.

A special education project presently in progress seeks to positively modify social and academic behavior of handicapped children by means of a carefully engineered program which combines a high ratio of success to failure experiences with immediate, positive reinforcement. A middle school experiment tests the benefits of an extended school year when pupils are permitted to vacation at the convenience of their families and when days are set aside for extension of their education experiences into the community, where they learn about and participate in governmental-political affairs, social welfare, and the economic life of the community. Other projects nearing completion include a physics curriculum for use at the tenth grade level and an environmental science program for ninth graders.

A major undertaking in the Laboratory School is the creation of a curriculum design which fuses career education into existing programs so that all children will learn about and participate in the world of work as part of their general education. The project, designated "F.A.I.S.," (The Fusion of Applied and Intellectual Skills) is funded by the Division of Vocational, Technical and dult Education of the State Department of Education. Now in its second year, the elementary phase of the program is being field tested in fifteen public schools while middle school materials and guides are being developed at P. K. Yonge. Ultimately, the project will encompass curriculum development and field testing from kindergarten through the twelfth grade.

It is hoped that the reading project reported in this document and the Laboratory School's attempts to find solutions to other "persistent problems in teaching and learning" will prove highly beneficial to the public schools of the state. Further inquiries relative to any of these projects are invited.

J. B. Hodges, Director
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CONTENTS

AN EXPERIMENT IN DEVELOPMENTAL, INDIVIDUALIZED READING:
AN ALTERNATIVE TO PERFORMANCE CONTRACTING

## The Study

The purpose of this P. K. Yonge Laboratory School investigation was to evaluate the effectiveness of a developmental, individualized reading program in grades six, eight, nine and eleven, when the responsibility for growth in reading is given to the student. The program was planned and directed by teacher-counselors and results and costs were compared with commercial performance contracting. Emphasis was placed on diagnostic and prescriptive procedures within a laboratory setting. Interaction between students and teacher-counselors was on a one-to-one basis.

## Did It Work?

The study sought answers to several questions. Based upon fifteen hours in the laboratory distributed over six weeks, data collected before, during, and after show the following:

1. Which measured skills in reading were changed significantly during the program?

   Reading rate gains were significant at all four grade levels. Mean gains ranged from 52 to 79 words per minute, 1.5 to 2.5 grade equivalents.

   Sixth graders gained 2.6 grade equivalents in story comprehension and four months in paragraph comprehension. Gains at the eighth, ninth, and eleventh grades were significant in only two sections. Mean gains in vocabulary were significant in four sections out of ten at the four grade levels.

   Since the program involved only fifteen hours of laboratory practice, spread over a period of six weeks, significant gains in comprehension and vocabulary were not anticipated. It is important that sixth graders showed a large gain in comprehension and that, overall, students were reading twenty-three percent faster at the end of the experiment, with no loss in comprehension.

2. Did students who volunteered for the program make greater progress than those required to participate?

Volunteer and compulsory groups were compared at the eighth and eleventh grade levels. In other grades, all pupils were required to participate.

Gains in rate, comprehension and vocabulary were significantly greater for eighth grade volunteers than for the compulsory group. Among eleventh graders, the compulsory group did as well as the volunteers. It should be noted, however, that results at the eleventh grade level were not entirely valid, since six members of the compulsory group were assigned to the laboratory for ten extra hours in preparation for service as laboratory assistants.

3. Is there a grade level at which the approach employed in this experment is most effective in the improvement of reading?

Results were inconclusive. Translated into grade equivalents, gains in rate and comprehension were largest at the sixth grade. Pupils in grades eight and eleven, however, made larger gains in words per minute. Those in grades nine and eleven made good gains in comprehension, also. Hence, it would seem that this method can be effective at all four grade levels in which it was used.

4. How did the initially low-achieving students perform during the experimental period? How did this compare with pupils in the Texarkana Performance Contract?

Twenty-four percent of the Texarkana pupils gained one or more years in reading and mathematics skills.[1] Sixty-four and six-tenths percent of comparable P. K. Yonge students gained over a year in reading rate and sixty-six and four-tenths percent gained 1.0 grade or more in reading comprehension. It should be remembered that pupils in Texarkana were elementary school pupils; those in the P. K. Yonge study were middle and high school students. It is possible that many of the Texarkana students were more severely retarded than those selected from the P. K. Yonge study for comparison. It should be noted, however, that these gains were made with fifteen hours of laboratory instruction spread over six weeks. The Texarkana pupils had an average of eighty hours of instruction spread over a year.

5. How did costs compare between P. K. Yonge and Texarkana?

Texarkana costs were reported as $80 for eighty hours of instruction.[2] P. K. Yonge costs were $30 for fifteen hours of

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[1] Education Recaps, November, 1971, p. 1.

[2] Performance Contracting in Education, Education Turnkey Systems, Research Press, Champaign, Illinois, 1970, pp. 113-114.

instruction. On an hourly basis, the Texarkana cost was $1.00 compared with $2.00 at P. K. Yonge. Under other performance contracts, estimated costs have ranged from $50 to $500 per pupil.[1]

## Why Improve Reading?

Last year, 48,789 pupils repeated grades in Florida's public schools at a cost of $35,528,149.00. Almost three in ten pupils entering the ninth grade fail to complete high school. It is safe to assume that the single greatest factor in creating these deplorable conditions is the large number of children with reading problems.

In increasing numbers, schools over the nation are turning to private business in their search for solutions to children's reading problems. Businesses contract with schools to increase pupil performance at a specified level--usually one grade equivalent in a specified time, at a specified cost to the school district.

This study demonstrates that there is an alternative by which schools can get comparable or greater gains with their own resources for the same or less cost.

## Why This Approach?

The task of reading improvement was placed in the larger context of personality development and was directed by teacher-counselors. Through a counseling relationship in a reading laboratory, each pupil had an opportunity to experience acceptance and positive regard. Emphasis was placed on diagnostic reading procedures, followed by each pupil setting his own goals and receiving assistance in developing an individualized program focusing on needs he considered to be important.

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[1] Performance Contracting: A Guide for School Board Members and Community Leaders, National School Boards Association, Evanston, Illinois, 1971, pp. 68-69.

The project was based on the premise that growth in feelings of self-worth, adequacy, and confidence are more conducive to the learning process than the direct teaching of reading. When a person has experiences that are positive, he views himself as adequate. When he fails, he tends to interpret the experience as proving his inadequacy and unworthiness. The program at P. K. Yonge was structured in such a way that successful experiences were not left to chance. The philosophy of the study is within the perceptual frame of reference as presented by Combs (1959) and Rogers (1965).

There seems to be a relationship between self-appraisal and ability to read. Wattenburg and Clifford found in their study (1964) that a measure of the self-concept of children in kindergarten was a good predictor of reading achievement in the second grade. Lamy (1965) had similar results. Williams and Cole (1965) found a positive correlation between self-concept and reading achievement in sixth graders. Brookhoover, Thomas, and Paterson (1967), in their six-year study, reported a positive correlation between concept of self and academic achievement. Evidence is accumulating that competence in reading is related to the way a person perceives himself.

It is important that each individual maintain and/or gain confidence in himself at whatever level he is functioning. Learning to read can be visualized as a process of developing a wide variety of skills along a continuum that extends throughout our lives (Ruth Strang, 1968). Early skills include attention to the simple signals of who, what, when, why, and where. More complex skills are developed as maturity of thinking and organization of ideas are integrated into the pupil's perceptual frame of reference. The level of such skills can be identified and systematically improved through a realistic course of action. The experimental model at P. K. Yonge is directed toward this goal.

## How Was It Done?

### The Pupils:

There were four middle and secondary school grade levels involved in the program. A total of 272 pupils in ten classes participated.

Sixty sixth graders from two sections participated. All were required to attend the laboratory. Group A was assigned to the laboratory while Group B participated in a developmental, teacher-directed program in the classroom. Group B then participated in the laboratory program. The performance of Group B in the classroom was compared with the performance of Groups A and B in the laboratory.

At the eighth grade level, the progress of twenty-nine students required to attend was compared with twenty-four who volunteered to participate.

Eighty-four ninth grade students from three sections were required to participate in the program. Progress of the three sections was compared.

In the eleventh grade, forty-six students from two sections were volunteer participants and twenty-nine students from the third section were required to participate in the program. Progress of the three sections was compared. Sampling techniques are described in Appendix I.

### The Staff:

The program was staffed by a half-time teacher-counselor and a third-time graduate assistant, both trained in developmental reading laboratory procedures. In addition, several eleventh grade students assisted in the laboratory after they had completed the program and had been given additional special training.

### The Place:

The laboratory was located in the school library and equipped with a variety of media such as cards, folders, programmed readers, tapes, pacers, and other

mechanical devices. Materials ranging from low elementary to college level were made accessible. Carrels, tables, and chairs were placed informally for comfort and mimimum disturbance. (Sources and costs of materials and equipment used in the program are listed in Appendix II.)

The Program:

The nine-week program included pre-testing, individual planning conferences, six weeks of laboratory experience, post-testing, and final evaluation conferences.

At the beginning of the program, all students in grades eight, nine, and eleven were given pre-tests using the Diagnostic Reading Test (Triggs) - Upper Level - Form A. Sixth graders were given the Diagnostic Reading Test - Lower Level - Form A. (Other evaluation instruments used are listed in Appendix II.)

After initial testing, the teacher-counselors scheduled individual conferences to provide an opportunity for each student to look realistically at himself as a reader. An interpretation of his reading test scores was given on the basis of percentile ranks within his present grade placement. Goal-setting by the student was encouraged and the responsibility for growth in reading skills was given him. He was assisted in developing an individualized program focusing on needs he felt were important. These might include areas of strength as well as weaknesses. There was no set curriculum and no grades. Care was exercised to prevent any student from developing a sense of failure.

During the six-weeks laboratory experience, the teacher-counselors provided continuous guidelines for the effective use of materials and methods needed to implement change. Students corrected their own answer sheets and charted progress daily. Close communication with the student regarding his progress was maintained through personal contacts in the laboratory and written responses in his folder.

After fifteen hours in the laboratory, spread over a period of six weeks, post-tests were given, using the Diagnostic Reading Test - Form C (Upper Level for grades eight, nine, and eleven and Lower Level for grade six). Group B sixth graders used Form D (Upper Level) after treatment. One volunteer group of eleventh graders used Form D (Upper Level) after treatment.

In addition, each student completed a progress report and self-evaluation. One class each of sixth, eighth, and ninth graders completed the GHD Scale, an attitude toward reading scale developed at P. K. Yonge (Appendix III). During a final individual conference, the teacher-counselor and student evaluated the student's gains in reading achievement and his success in assuming the responsibility for improving reading skills.

Classroom teachers were encouraged to be in the laboratory with their students. They did not assign materials nor become involved in student programs except to act as catalysts. Attendance provided an opportunity for teachers to observe attitudes, work habits, and peer relationships as well as laboratory activities. Some teachers participated in their own programs of self-improvement in the more complex skills of reading, working along with the students. Modeling behavior of teachers who chose to participate in the program was a positive influence.

## What Do The Data Show?

In analyzing test results, arithmetic means were calculated for rate, story comprehension, paragraph comprehension, and vocabulary for each section at each grade level and for the sections combined by grade. In addition, means for word recognition were calculated for sixth graders.

For testing significance of differences, change scores were used for each individual. Since there was a significant correlation between initial and final performance, socres could be calculated as the ratio of the mean difference to

its standard error. While this meant fewer degrees of freedom, the standard error was reduced through using all possible correlations between pre- and post-test scores.

Since grade equivalent tables were not given with the test manual, these were estimated. Corresponding percentile ranks were examined for score equivalents in grades below and above the one of interest. These indicated reading rate differences of only ten or twelve words per minute per year, so a more conservative procedure was followed. It was assumed that growth was uniform and linear for preceding years and that the score representing the fiftieth percentile, divided by one less than the grade level, represented one year of growth. Changes were then divided by this figure to estimate growth as a grade equivalent. Allowances were made for the time of year in which the section participated in the reading laboratory.

In estimating grade equivalents of rate changes, pre-test means for grades six, eight, nine, and eleven were compared as to reading rate and changes were estimated as the "normal" growth rate for P. K. Yonge students. The method used to compare changes by equivalent percentile ranks at different grade levels gave 10 to 12 words per minute as a grade equivalent. The P. K. Yonge "normal" growth rate was 14 to 15 words per minute between grades six and eleven. Using the procedure described above yielded 25 to 32 words per minute as one grade equivalent.

A similar procedure was used to estimate grade equivalent for changes in comprehension and vocabulary.

Besides reporting pre- and post-test mean raw scores (words per minute or number of correct answers) initial and final percentile ranks are related to the respective means. Changes are listed as differences in raw scores (words per minute or number of correct answers), in percentile ranks, and in grade equivalents.

Also reported are t values (the ratio of the statistic to the standard error), whether the changes are significant, and if so, the level of significance.

In addition to the tests for significance of differences where single comparisons are made, Scheffe's procedure was used for estimating confidence intervals where two or more comparisons were made or where comparisons were made for combined groups. Those differences were accepted as significant where the confidence interval did not include zero. When more than one comparison is made, t values must be adjusted. Several procedures are available. The one developed by Scheffé was used because it applies when there are unequal numbers in the various groups being compared.

Grade Six:

One of the two sections in grade six was used as a control for the other group and later for itself when pupils from this group went to the laboratory. Test results are reported in Table 1. All pre and post means of reading rates were above the sixtieth percentile for sixth graders. The post means ranged from the seventy-fifth to ninety-fifth percentiles. Most of the other means were initially below the fiftieth percentile and only five of fifteen post-test means were above the fiftieth percentile.

On rate, the three groups made significant gains; the control group at the .05 level and the two experimental groups at the .01 level. The gains of each experimental group significantly exceeded the gain of the control group. Using Scheffé's procedure, the ninety-five percent confidence intervals are 7.46 to 51.22 and 10.50 to 55.50 for differences in gain of 29.37 between experimental group one and the control group and 33.15 between experimental group two and the control.

On paragraph comprehension, both experimental groups made gains significant at the .01 level. The control group change was not significant. The difference

in change between the combined experimental groups and the control group was 1.94. This has a ninety-five percent confidence interval of .32 to 3.56 and is a significant difference.

Both experimental groups and the two combined made gains on word recognition significant at the .05 and .01 levels. The apparent change of the control group was not significant. While differences in gains seemed to favor the experimental groups, they were not significant as the ninety-five percent confidence interval ranged from -.42 to 3.24.

On story comprehension, all three groups gained beyond the .01 level. Using Scheffé's procedure, ninety-five percent confidence intervals for differences in gains would be as follows:

| Groups | Differences | Confidence Interval |
|---|---|---|
| II - I | -1.61 | (-3.12, -.10) |
| II - C | -.50 | (2.62, -.40) |
| I - C | -1.11 | (-2.05, 1.05) |
| I + II - C | .30 | (-.86, 1.46) |

Hence, the only significant difference in amount of change is between experimental group II and experimental group I.

When all scores, except those for rate, are combined, the gain of the control group is significant at the .05 level. Both experimental groups gained beyond the .01 level. This was also true of the experimental groups combined.

When ninety-five percent confidence intervals are established for the difference in gains, results are as follows:

| Groups | Differences | Confidence Interval |
|---|---|---|
| II - I | .58 | (-3.24, 6.64) |
| II - C | 6.73 | (1.17, 11.51) |
| I - C | 6.15 | (0.70, 10.58) |
| I + II - C | 6.42 | (2.10, 9.82) |

The two experimental groups were not significantly different from each other but both individually and combined, their gains significantly exceeded that of the control group.

TABLE 1

GRADE SIX
PRE AND POST SCORES
DIAGNOSTIC READING TEST, LOWER LEVEL
TWO EXPERIMENTAL GROUPS AND ONE CONTROL GROUP

| | | CONTROL | | | EXPERIMENTAL I | | | EXPERIMENTAL II | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] |
| RATE | Pre | 225.81 | | 63 | 238.10 | | 69 | 245.53[3] | | 74 |
| | Post | 246.44[3] | | 75 | 288.10 | | 93 | 299.31 | | 95 |
| | Change | 20.63 | .8 | 12 | 50.00 | 2.5 | 24 | 53.78 | 2.5+ | 21 |
| | t | 2.20 | | | 6.04 | | | 6.03 | | |
| | p | <.05 | | | <.001 | | | <.001 | | |
| PARAGRAPH COMPREHENSION | Pre | 29.08 | | 38 | 27.33 | | 31 | 29.50 | | 40 |
| | Post | 29.66 | | 41 | 29.88 | | 42 | 32.00 | | 53 |
| | Change | .58 | .1 | 3 | 2.55 | .4 | 11 | 2.50 | .4 | 13 |
| | t | .58 | | | 2.00 | | | 2.99 | | |
| | p | n.s. | | | .05 | | | <.01 | | |
| WORD RECOGNITION | Pre | 19.38 | | 22 | 18.55 | | 16 | 20.32 | | 28 |
| | Post | 20.79 | | 30 | 21.07 | | 32 | 23.54 | | 48 |
| | Change | 1.41 | .6 | 8 | 2.52 | 1.0 | 16 | 3.22 | 1.3 | 20 |
| | t | .98 | | | 3.42 | | | 6.50 | | |
| | p | n.s. | | | <.01 | | | <.001 | | |
| VOCABULARY | Pre | 36.26 | | 34 | 36.97 | | 38 | 35.37 | | 31 |
| | Post | 35.37 | | 30 | 37.87 | | 42 | 37.81 | | 41 |
| | Change | -.89 | -.1 | -4 | .90 | .1 | 4 | 2.44 | .2 | 10 |
| | t | -.62 | | | 1.09 | | | 2.77 | | |
| | p | n.s. | | | n.s. | | | .01 | | |
| STORY COMPREHENSION | Pre | 7.27 | | 43 | 6.37 | | 34 | 9.73 | | 69 |
| | Post | 9.73 | | 70 | 9.94 | | 72 | 11.69 | | 85 |
| | Change | 2.46 | 2.4 | 27 | 3.57 | 3.5 | 38 | 1.96 | 2.0 | 16 |
| | t | 6.46 | | | 3.28 | | | 3.97 | | |
| | p | <.001 | | | <.01 | | | <.001 | | |

[1]Grade Equivalent

[2]Percentile Rank

[3]Differences in means because of student who withdrew from school

Table 1 also shows percentile ranks for various means and estimates of grade equivalents of change scores. These are based upon a comparison of scores for the same percentile ranks on the grade five norms and considering the difference in point value for the same percentile rank as one grade equivalent.

The most striking changes were in reading rate where the experimental groups gained about 2.5 grade equivalents compared with .8 for the control group. These are conservative estimates as a high proportion (over three-fifths) of the experimental pupils made the top possible score of 330 words per minute on the test.

Since small differences--one or two responses--could mean a change of one grade equivalent, subscores in vocabulary and comprehension should be viewed with caution. It is true that eleven comparisons show real or apparent gains. On total the control group showed an estimated grade equivalent increase of about two months--which would be normal growth between the two tests. The two experimental groups, however, made estimated increases of seven and eight months in the same period.

Grade Eight:

One section of grade eight consisted of volunteers only. All pupils in the other section were required to attend. The volunteers had an initial reading rate much higher than the compulsory group--290 words per minute verus 238 words per minute, corresponding to the eightieth and the sixtieth percentiles respectively. Part of this difference could be that the compulsory group attended the laboratory in the fall and the volunteers in the spring. However, both groups made substantial gains. The reading rate of the volunteer group at the end of the experiment was 381 words per minute which placed that group in the ninty-fifth percentile. The reading rate of the compulsory group increased to 299 words per minute--the eighty-fourth percentile. On comprehension

and vocabulary, with one exception, mean scores were at or above the fiftieth percentile on both pre- and post-tests. Test results are reported in Table 2.

TABLE 2

GRADE EIGHT
PRE AND POST SCORES
DIAGNOSTIC READING TEST, UPPER LEVEL
TWO EXPERIMENTAL GROUPS -- ONE COMPULSORY, ONE VOLUNTEER

| | | COMPULSORY 8A | | | VOLUNTEER 8B | | |
|---|---|---|---|---|---|---|---|
| | | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] |
| RATE | Pre | 238.26 | | 60 | 284.78 | | 80 |
| | Post | 299.76 | | 84 | 381.35 | | 95 |
| | Change | 61.50 | 1.8 | 24 | 96.57 | 3.0 | 15 |
| | t | 5.00 | | | 10.31 | | |
| | p | <.001 | | | <.001 | | |
| STORY COMPREHENSION | Pre | 10.56 | | 56 | 12.72 | | 72 |
| | Post | 10.75 | | 57 | 13.36 | | 78 |
| | Change | .19 | .1 | 1 | .64 | .3 | 6 |
| | t | .18 | | | .17 | | |
| | p | n.s. | | | n.s. | | |
| PARAGRAPH COMPREHENSION | Pre | 10.50 | | | 12.35 | | |
| | Post | 8.15 | | | 13.35 | | |
| | Change | -2.35 | -1.5 | | 1.00 | .6 | |
| | t | -5.04 | | | 1.82 | | |
| | p | <.001 | | | n.s. | | |
| VOCABULARY | Pre | 26.96 | | 54 | 26.96 | | 54 |
| | Post | 25.96 | | 51 | 31.20 | | 70 |
| | Change | -1.00 | -.3 | -3 | 4.24 | 1.0 | 16 |
| | t | .89 | | | 3.27 | | |
| | p | >.20 | | | <.01 | | |

The 61.50 words per minute mean gain for the compulsory group was 5.00 times its standard error. The 96.57 words per minute mean gain for the volunteers was ten times its standard error. Both of these values have a probability close to

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[1] Grade Equivalent

[2] Percentile Rank

zero. When the groups were combined, they made a mean gain of 77.96 words per minute. This has a t of 5.83, also with a probability very close to zero. The 35.07 words per minute by which the volunteers exceeded the compulsory group was significant at the .05 level.

Neither group changed significantly on story comprehension.

On the vocabulary subtest, the volunteers gained 4.24 against -1.04 (a loss) for the compulsory group. The volunteer change was significant at the .01 level. The compulsory group did not have a significant change. The difference in change, 5.28, was significant in favor of the volunteers at the .01 level. On paragraph meaning, the compulsory group lost 2.33 points, significant at the .01 level. The volunteers had an apparent increase of 1.00 which was not significant. The difference in changes, 3.33, gave a t of 4.66, significant beyond .001 favoring the volunteers.

When three subtests of vocabulary, story comprehension, and paragraph comprehension were combined, the following changes were found to have occurred:

| | Mean Change | St. Err. | t | p |
|---|---|---|---|---|
| Volunteers Group | 5.88 | 1.74 | 3.38 | .01 |
| Compulsory Group | -3.16 | 1.32 | 2.39 | .05 |
| Difference | 8.59 | 2.18 | 3.94 | .001 |

Thus, the volunteers made a significant gain, the compulsory group a significant drop, and the differential change of 8.59 favored the volunteers with a probability of .001.

The compulsory group increased 61.5 words per minute in reading rate. This was the equivalent of 1.8 grades using the system described. The volunteers, starting six months later and with a higher initial rate, nevertheless, gained 96.6 words per minute, the equivalent of at least 3.0 years, and 1.2 years more than the other group.

On vocabulary, the volunteers went up one year while the other group dropped about three months.

Grade Nine:

The three ninth grade groups were compulsory. Initial reading rates were relatively high. Means varied from 267 words per minute to 282 words per minute corresponding to the seventy-first to seventy-sixth percentiles. On the post-test, rates ranged from 301 words per minute to 370 words per minute, mean words per minute corresponding to the eighty-third to ninety-fifth percentiles.

Mean comprehension and vocabulary scores were near the fiftieth percentile on both pre- and post-tests. Changes in comprehension and vocabulary were small. Test results on all areas are found in Table 3.

TABLE 3

GRADE NINE
PRE AND POST SCORES
DIAGNOSTIC READING TEST, UPPER LEVEL
THREE EXPERIMENTAL GROUPS -- ALL COMPULSORY

| | | GROUP I | | | GROUP II | | | GROUP III | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] |
| RATE | Pre | 281.69 | | 76 | 267.45 | | 71 | 276.55 | | 75 |
| | Post | 369.61 | | 95.5 | 300.93 | | 83.5 | 316.62 | | 88 |
| | Change | 87.92 | 2.3 | 19.5 | 33.48 | .9 | 12.5 | 40.07 | 1.0 | 13 |
| | t | 4.68 | | | 2.40 | | | 4.08 | | |
| | p | <.001 | | | <.05 | | | <.001 | | |
| STORY COMPREHENSION | Pre | 11.96 | | 51 | 10.63 | | 42 | 11.48 | | 48 |
| | Post | 11.65 | | 49 | 11.04 | | 44 | 11.96 | | 51 |
| | Change | -.31 | -.2 | -2 | 1.41 | .9 | 2 | .48 | .3 | 3 |
| | t | -.54 | | | 5.27 | | | .72 | | |
| | p | n.s. | | | <.001 | | | n.s. | | |
| PARAGRAPH COMPREHENSION | Pre | 11.18 | | | 10.30 | | | 11.28 | | |
| | Post | 12.22 | | | 9.86 | | | 11.00 | | |
| | Change | 1.04 | .7 | | -.44 | -.3 | | -.28 | -.2 | |
| | t | 1.31 | | | -1.44 | | | -.54 | | |
| | p | <.30 | n.s. | | n.s. | | | n.s. | | |
| VOCABULARY | Pre | 30.89 | | 53 | 30.26 | | 51 | 28.24 | | 43 |
| | Post | 31.66 | | 56 | 27.72 | | 41 | 33.76 | | 62 |
| | Change | .77 | .7 | 3 | -2.54 | -.9 | -10 | 5.52 | 1.7 | 19 |
| | t | .10 | | | 1.96 | | | 4.35 | | |
| | p | n.s. | | | <.10 | n.s. | | <.001 | | |

[1] Grade Equivalent

[2] Percentile Rank

All three groups made gains in rate which were statistically significant. The 87.92 words per minute increase for group I had a t of 4.68, significant beyond the .001 level. When the three groups were combined, the mean gain was 54.24 words per minute with a t of 3.71, significant at the .001 level.

Only group II made a significant gain in story comprehension. Group III increased 5.52 on vocabulary score. This change had a t of 4.35, significant at the .001 level. When comprehension scores were combined, the probability of the resulting mean gain was between .10 and .05, hence not significant.

The table also shows percentile ranks for the various means as well as estimate of change translated into grade equivalents. At this level, comparisons between the same percentile ranks with grades below and above gave grade equivalents in which the differences were extremely small. This is a weakness of the grade equivalent as a measure of either status or change among high school pupils. To get a more realistic estimate, scores were divided by the years in school up to the time of testing, and the quotient used as one grade equivalent. This assumes a linear relationship from year to year.

Mean gains on reading rate, expressed as grade equivalents, varied from .9 to 2.3. When the three groups were combined, the gain was 1.6 grade equivalents.

Other gains were modest. Group II gained .9 of a grade equivalent on story comprehension. Group I increased .7 on paragraph comprehension and on vocabulary. Group III went up 1.7 grade equivalents on vocabulary.

When the three groups were combined, there was no change in grade equivalent on paragraph comprehension (.03). Story comprehension showed an apparent climb of .4 equivalents. The significant increase in vocabulary was equivalent to .5 grade.

Grade Eleven:

The eleventh graders performed somewhat better on comprehension and vocabulary, than did the eighth or ninth graders, though by no means as well as they

did on reading rate. Only one of twelve initial means was below the fiftieth percentile and none of the post means was below the fiftieth percentile. Twelve means were above the seventieth percentile and four exceeded the eightieth percentile. Table 4 presents the total results.

TABLE 4

GRADE ELEVEN
PRE AND POST SCORES
DIAGNOSTIC READING TEST, UPPER LEVEL
TWO EXPERIMENTAL GROUPS --- ONE COMPULSORY, ONE VOLUNTARY

| | | GROUP I COMPULSORY - FORM C | | | GROUP II VOLUNTARY - FORM C | | | GROUP III VOLUNTARY - FORM D | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] | RAW SCORE | G.E.[1] | P.R.[2] |
| RATE | Pre | 331.04 | | 87 | 312.74 | | 81 | 298.82 | | 76 |
| | Post | 387.93 | | 96.5 | 370.04 | | 94.5 | 397.56 | | 97 |
| | Change | 56.89 | 1.9 | 9.5 | 57.30 | 1.9 | 13.5 | 98.74 | 3.3 | 11 |
| | t | 4.13 | | | 6.96 | | | 7.29 | | |
| | p | <.001 | | | <.001 | | | <.001 | | |
| STORY COMPREHENSION | Pre | 13.00 | | 43 | 16.04 | | 74 | 15.05 | | 63 |
| | Post | 14.21 | | 54 | 16.43 | | 78 | 16.75 | | 81 |
| | Change | 1.21 | .9 | 11 | .39 | .3 | 4 | 1.70 | 1.1 | 18 |
| | t | 1.63 | | | .91 | | | 2.73 | | |
| | p | n.s. | | | n.s. | | | <.01 | | |
| PARAGRAPH COMPREHENSION | Pre | 14.50 | | | 15.13 | | | 16.45 | | |
| | Post | 14.14 | | | 13.39 | | | 16.84 | | |
| | Change | -.36 | -.2 | | -1.74 | -1.1 | | .39 | .2 | |
| | t | -.65 | | | -2.27 | | | 1.31 | | |
| | p | n.s. | | | <.05 | | | n.s. | | |
| VOCABULARY | Pre | 42.48 | | 64 | 44.35 | | 70 | 46.55 | | 76 |
| | Post | 46.51 | | 76 | 44.80 | | 71 | 45.33 | | 73 |
| | Change | 4.03 | .9 | 12 | .45 | .1 | 1 | -1.22 | -.3 | -3 |
| | t | 3.40 | | | .62 | | | -1.13 | | |
| | p | <.01 | | | n.s. | | | n.s. | | |

Two groups took Form C of the post-test. One was a volunteer group; the other compulsory. The third group, also volunteer, took Form D as the post-test.

---

[1] Grade Equivalent

[2] Percentile Rank

All three groups had relatively high initial mean reading rates--from 299 words per minute for group III to 313 for group II to 331 for group I. All of these were above the seventy-fifth percentile and two were above the eightieth percentile. Despite a higher beginning rate, all groups substantially increased their rates while in the laboratory, ending with mean rates of 370 to 397 words per minute. These approximated or exceeded the ninety-fifth percentile. The t values for the strong advances made in reading rate--56.89, 57.30, and 98.74 words per minute--were all significant beyond the .001 level.

The changes between voluntary and compulsory groups on Form C were almost identical. Confidence intervals for differences in changes are as follows:

| Groups | Differences | 95% Confidence Interval |
|---|---|---|
| Form D - Form C (Vol.) | 41.44 | (11.61, 71.27) |
| Form D - Form C (Comp.) | 41.85 | (12.02, 71.68) |

Hence, both differences in amount of change are significant.

When two C groups were combined, the mean gain of 57.07 was significant beyond the .001 level. When all groups were combined, the mean gain of 70.02 was significant beyond the .001 level.

The real gains in rate were accompanied by one significant and two apparent gains in story comprehension. The groups post-tested with Form C had apparent gains of 1.21 and .39. The group post-tested with Form D increased 1.70, significant at the .01 level. On the paragraph meaning, the two C groups dropped 1.02 points, significant at the .01 level. The Form D group did not increase significantly.

On Form C, one group made a gain on vocabulary significant at the .01 level. When the two C groups were combined, the advance of 2.49 was significant at the .01 level. The Form D group had an apparent loss.

Grade equivalents for changes were estimated the same way for grade eleven as for grades eight and nine. Reading rates went up 1.9 grades for both C groups

and 3.3 for the D group. Form D is believed to be somewhat easier than Form C and hence may give an inflated estimate of gain in rate and comprehension. Story comprehension equivalent gains were .9, .3, and 1.1. The two C groups gained .6 grade equivalents. The three combined gained .7.

The compulsory group went up .9 grade equivalents in vocabulary. When the C groups were combined, the gain was equivalent to five months. The compulsory group outgained the volunteers by 3.58 points in vocabulary significant at the .01 level.

Between Grade Comparisons:

Unweighted pre and post means are shown in Table 5 by grade level for rate, total comprehension, and vocabulary.

TABLE 5

UNWEIGHTED MEANS FOR READING RATE, TOTAL COMPREHENSION, AND VOCABULARY BY GRADES

| | RATE | | TOTAL COMPREHENSION | | VOCABULARY | |
|---|---|---|---|---|---|---|
| GRADE | PRE | POST | PRE | POST | PRE | POST |
| 6 | 241.82 | 293.71 | * | * | * | * |
| 8 | 264.02 | 340.56 | 23.07 | 22.80 | 26.96 | 28.58 |
| 9 | 274.56 | 328.72 | 22.28 | 22.91 | 29.80 | 31.05 |
| 11 | 314.20 | 385.18 | 30.06 | 30.59 | 44.46 | 45.56 |

On the rate pre-test mean, there was a steady increase from grade to grade. Because of the large gain made by the eighth grade, thier post-test mean exceeded that of the ninth grade.

On total comprehension, changes were slight. Means for grades eight and nine were very similar both by grade level and by pre- and post-testing. The

*Sixth grade test was so different from the form used in grades eight, nine and eleven that no comparison would make sense.

eleventh graders performed much better than either grade eight or nine. It showed only a small difference between pre- and post-testing.

On vocabulary, means increased consistently by grade level. Likewise, all three grades showed positive changes over the experimental period.

When changes are compared by grade level as shown in Table 6, increases in reading rate are most striking. With fifteen hours in the laboratory distributed over six weeks, mean gains ranged from 51.9 to 79.0 words per minute with an unweighted mean increase of 63.7. With the exception of grade nine, which went up 1.4 grade equivalents, the other grades gained over two grade equivalents with a mean gain of 2.1 for the four grades combined.

TABLE 6

SUMMARY OF CHANGES IN GRADES IN SCORES AND GRADE EQUIVALENTS

| GRADE | RATE | | STORY COMPREHENSION | | PARAGRAPH COMPREHENSION | | WORD RECOGNITION | | VOCABULARY | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Score | G.E. | Score | G.E. | Score | G.E. | Score | G.E. | Score | G.E. |
| 6 | 51.9 | 2.5 | 2.77 | 2.7 | 2.52 | .4 | 2.86 | 1.2 | 1.67 | .15 |
| 8 | 79.0 | 2.1 | .42 | .2 | -.68 | -.4 | | | 1.62 | .35 |
| 9 | 53.8 | 1.4 | .53 | .3 | .10 | .1 | | | 1.68 | .50 |
| 11 | 70.0 | 2.3 | 1.10 | .8 | -.57 | -.4 | | | -.39 | .25 |
| Unweighted Means | 63.7 | 2.1 | 1.21 | 1.0 | .34 | -.1 | 2.86 | 1.2 | [illegible] | .35 |

Of equal interest is the question of what happened to comprehension of material as rates increased. In two grades, eight and nine, increases for grade equivalent of .2 and .3 are not beyond normal growth expectation of .15 to .2 for the period between testing. However, in grades eleven and six, gains in story comprehension were the equivalent of eight months and of two years, seven months. Overall, the unweighted mean change was the equivalent of growth experienced in one year.

Paragraph comprehension results were almost unchanged.

Vocabulary scores represented growth expected in about one-third of a year. Normal expectation would be about half this amount.

The word recognition section occurred only on the sixth grade text. Here the gain was a solid 1.2 grade equivalents.

## What Does This Mean?

### The Average Pupil:

In less technical language what do these results mean? If there were an "average" student, what would happen to him as he went through the laboratory program? A study of the two graphs and Table 5 helps to answer these questions.

The first chart shows that the average sixth grader is reading about 242 words per minute before entering the laboratory program. The typical eleventh grader would be reading 314 words per minute. The graph shows that there is a regular increase from grade to grade in reading rate. Since P. K. Yonge has a relatively low turnover and dropout rate, these differences cannot be attributed to loss of poorer students. They represent the normal growth in rate to be expected with regular classroom procedures. Chart one shows that although the seventh grade was not tested, the rate of increase seems constant from grades six through grade nine. There is practically no change in the slope of the line. From grade nine through grade eleven, the line is a little steeper, indicating a slightly more rapid growth in reading rate. Overall, however, the average P. K. Yonge pupil will gain about 14 to 15 words per minute each year in his reading rate. This is slightly more than differences between rates for corresponding percentile ranks for consecutive grades reported in the 1967 Diagnostic Reading Test Norms of 10 to 12 words per minute.

Now what happens to him when he goes into the laboratory for diagnosis, a planned program to increase his skill, fifteen hours practice distributed over

six weeks and a final evaluation of his progress. Chart 2 shows the average sixth grader is now reading about like the average P. K. Yonge tenth grader who has not received the special instruction. Eighth and ninth graders--the average ones—are reading at or beyond the rate of average P. K. Yonge twelfth graders. The eleventh graders are reading at the rate of the average college junior or senior.

CHART 1

PRE AND POST MEANS
READING RATE AND TOTAL COMPREHENSION

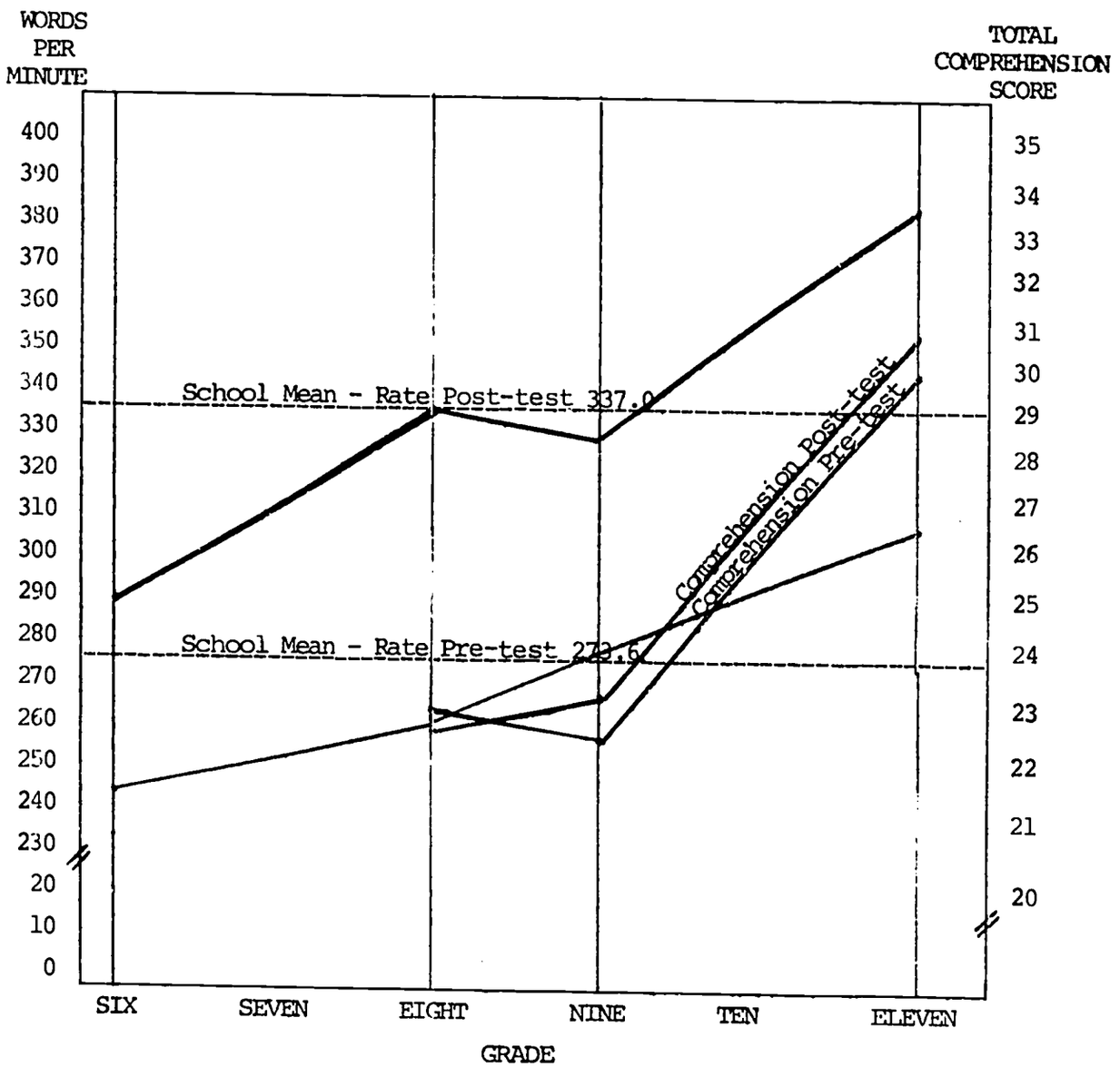
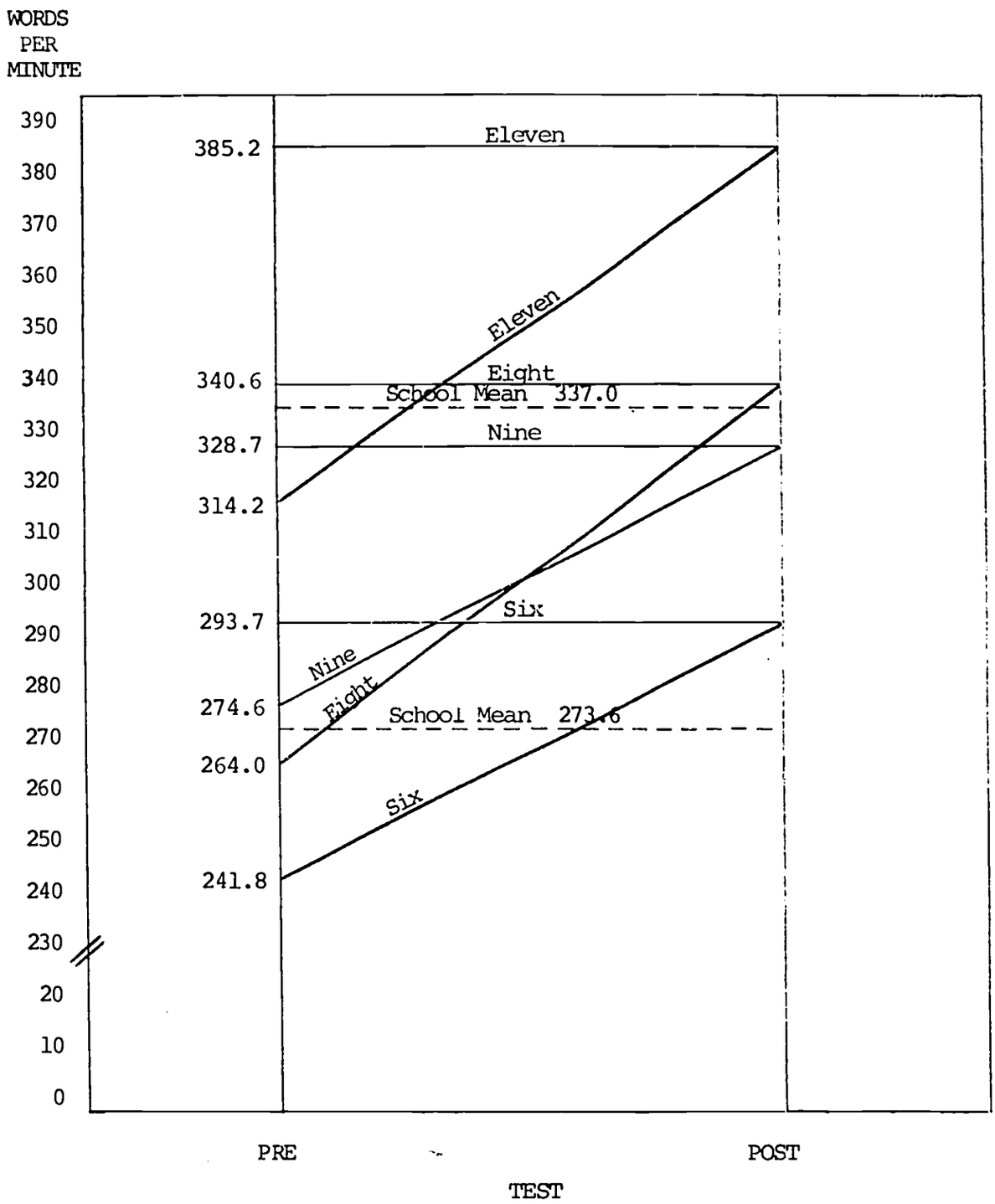


CHART 2

PRE AND POST MEANS
READING RATE GRADES
SIX, EIGHT, NINE, AND ELEVEN



It must be remembered that P. K. Yonge students were reading, on the average, above the test medians for their grade level. Hence, some regression effect might cause data to show less than actual gains. Despite this, the average pupil participating in the experimental program, in terms of typical growth to be expected in the Laboratory School as part of normal development, advanced more than four years in his reading rate. On the whole, reading rates for those involved in the test went from about 274 words per minute to 337 words per minute, a gain of about 63 words per minute. This is a twenty-three percent increase. This means that pupils can cover material like that used in the test at a rate twenty-three percent faster than they could before they went into the laboratory. They can cover, in the same time period, from a fifth to a fourth more material. They could do a project in greater depth in the same time. They could do another course if they were carrying four which required this kind of reading. They could read five books for recreational reading in the time now required for four.

The question might be raised, "What good is it to read faster if they comprehend less?" Anybody can skim material and seem to increase rate. An examination of total comprehension scores indicates that there was a very slight apparent loss for the eighth graders and small gains for ninth and eleventh graders. For the three grades combined, there was a modest positive change in comprehension scores. The sixth grade test was not comparable to the test given in the other grades. However, significant gains were made by both sixth grade groups on paragraph comprehension, word recognition, story comprehension and by one group on vocabulary. When all four of these are combined, the gain is about three-fourths of a grade equivalent. So the question raised can be answered--the increase in rate is achieved without loss in comprehension. Comprehension may even be slightly increased. It definitely increased with sixth graders. At the same time there was a small, <u>real</u> gain in vocabulary.

The Below Average Pupil:

According to Education Recaps, November, 1971, on the Texarkana study, "only twenty-four percent of the students made the target level of one or more years growth in reading and math." How do P. K. Yonge results compare with this rather disappointing Texarkana record after one year of performance contracting? To help answer this question, pupils at P. K. Yonge who performed below the fortieth percentile for the school or who were a year or more below grade level on the test norms were selected by pre scores for each subtest and changes were studied.

On reading rate, 64 of 99 or 64.6 percent gained 1.0 or more grade equivalents. Many pupils made gains of 3.0 grade equivalents or more (24 or 24.2 percent). Of equal interest is the question of how rate changes and comprehension changes were related. Eighty-seven or 66.4 percent of those selected as below grade level made gains of 1.0 grade equivalents or more in comprehension.

On vocabulary, the results were less impressive. Only 31.8 percent made gains of one year or more.

It should be remembered that these changes occurred over an eight or nine week interval between testing with different forms of the test. In the interval, pupils spent fifteen hours over a six-weeks period in laboratory practice. This should be compared to the Texarkana change over an interval of one year.

TABLE 7

DISTRIBUTION OF CHANGES FOR STUDENTS BELOW FORTIETH PERCENTILE OR ONE GRADE EQUIVALENT BELOW GRADE LEVEL

| GRADE | RATE | | | STORY COMPREHENSION | | | VOCABULARY | | | COMBINED COMPREHENSION | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Loss | 0-.9 | 1.0 up | Loss | 0-.9 | 1.0 up | Loss | 0-.9 | 1.0 up | Loss | 0-.9 | 1.0 up |
| 6 | 1 | 3 | 12 | 3 | 8 | 36 | 8 | 18 | 6 | 2 | 18 | 14 |
| 8 | 1 | 5 | 12 | 4 | 4 | 8 | 12 | 8 | 12 | | | |
| 9 | 5 | 11 | 19 | 9 | 6 | 24 | 18 | 26 | 15 | | | |
| 11 | 0 | 9 | 21 | 2 | 8 | 19 | 5 | 6 | 11 | | | |
| TOTALS | 7 | 28 | 64 | 18 | 26 | 87 | 43 | 58 | 44 | 2 | 18 | 14 |
| PERCENTS | 7.1 | 28.3 | 64.6 | 13.7 | 19.8 | 66.4 | 29.6 | 40.0 | 31.8 | | | |

## What Additional Research Is Needed?

It should be remembered that with the exception of one sixth grade group which served as a control group--and a good control since it had been randomly assigned and since it received a comparable amount of reading instruction by another method for the same length of time as those in the experimental group--none of the other sections can be considered to have participated in a "true" experiment. However, these others might be viewed as a combination of institutional cycle and time series designs. While the results are gratifying to those involved, it is possible that some of the growth could be attributed to the "Hawthorne" effect. Further, there are many questions suggested and not answered by the first year of work in the laboratory.

It is not known whether the increased reading skills persist after pupils are several weeks or months away from the laboratory. It would be desirable to find out whether gains would continue to increase if the laboratory period were longer, for example, twelve weeks instead of six. Should this be true, after what length of time might a plateau be reached following which further laboratory time would not be economically beneficial? Also, what would happen to performance if pupils went to the laboratory daily instead of on alternate days? Those students who later became laboratory assistants did this and seemed to make somewhat greater gains than others. However, they volunteered for this assignment and there were only a few of them.

Would those pupils, especially the third of the initial low achievers, who did not make substantial gains at the end of the regular laboratory period gain if they went through a second, or if necessary, a third cycle? Would a longer period in the laboratory result in vocabulary gains more nearly comparable to those in rate and comprehension observed in the shorter period? Do changes in rate, comprehension, and vocabulary persist at the same levels over time? To answer many of these questions, true experimental designs are needed.

While some evidence was collected the first year on attitudes toward reading and toward the reading laboratory, it would be desirable to do systematic pre- and post-testing of participants to assess possible changes. Obviously, it is not very useful to improve reading skills if in the process the persons involved have their urge to read weakened instead of strengthened. It would seem that unobtrusive measures such as library records before and after the laboratory might supplement attitude tests.

Since the tests used did not measure all pupils involved, especially in the sixth grade, it would be desirable to use other tests so that all pupils can be measured before and after the laboratory and a truer measure of change determined. Also, since the P. K. Yonge population is being deliberately changed to make it more representative of the state as a whole, it would be desirable to select reading tests which can be used over a wide range of grades, to administer these tests to pupils over their range, and to develop local norms to supplement those given in the test manual.

These are directions being taken by the reading research at P. K. Yonge in the middle school and high school during the next three years.

## How Can Other Schools Incorporate This Program?

### A Place:

The program requires no special building. Existing classroom or library facilities equipped with a minimum of twelve wired carrels can be utilized.

### Equipment and Materials Cost:

Equipment and materials, including the twelve carrels, listed in Appendix II, require a capital outlay of $6,609. On a depreciating scale, these costs for one year were less than $1,400. Salaries and consultant fees were an additional $6,750. The total cost of operating the program for two hundred and seventy-two students during 1971-72 was $8,126.

Staff:

During the initial laboratory period, or for approximately three weeks, two adult staff members and several students assistants were present. During the remaining weeks, one adult and student assistants formed as adequate staff. The experience of those directing the experiment was that utilization of students as assistants in the laboratory not only aided in implementation of the program but materially benefited those serving in such a capacity.

It is thought that by initially training a group of six to eight student assistants, one adult staff member could conduct the program. In this situation, the number of pupils participating in any given group should probably be less than thirty.

Although the project director at P. K. Yonge spent approximately fifty hours in training, with the materials and procedures listed here, it is believed that a person could be prepared to offer such a program in less time. For a person with an understanding of counseling as well as the teaching of reading, a three to four day workshop could provide the necessary background and skills. A model for such a workshop is described in Apperdix IV.

P. K. Yonge Laboratory School is in a position to provide this workshop, at cost, either in a school district if the number of interested personnel warrents this approach or on the University of Florida campus if persons from different districts would like to come together.

BIBLIOGRAPHY

Brookhover, W. B., A. Patterson, and S. Thomas. "Self Concept of Ability and School Achievement." Sociology of Education. 1964, 37:27-78.

Buros, Oscar Krisen, Ed. The Fourth Mental Measurement Yearbook. Highland Park, New Jersey: The Gryphon Press, 1953.

Buros, Oscar Krisen, Ed. The Sixth Mental Measurement Yearbook. Highland Park, New Jersey: The Gryphon Press, 1965.

Combs, A. and D. Snygg. Individual Behavior. New York: Harper and Row, 1959.

Education Recaps. Princeton, New Jersey: Education Testing Services, Nov., 1971.

Lamy, M. W. Relationship of Self Perceptions of Early Primary Children to Achievement. In Ira Gordon, Ed., Human Development: Readings in Research. Chicago: Scott, Foresman and Company, 1965.

Performance Contracting: A Guide for School Board Members and Community Leaders. National School Boards Association, Evanston, Illinois, 1971.

Performance Contracting in Education. Education Turnkey Systems. Champaign, Illinois: Research Press, 1970.

Roger, Carl R. Counseling and Psychotherapy: Theory and Practice. New York: Harper and Row, 1959.

Spache, George D. Toward Better Reading. Champaign, Illinois: Garrard Publishing Company, 1966.

Strang, Ruth. Reading Diagnosis and Remediation. Neward, Deleware: International Reading Association Research Fund, 1968.

Triggs, R. O. et al. Diagnostic Reading Tests. Mountain Home, North Carolina: The Committee on Diagnostic Reading Tests, Inc., 1966.

Wattenburg, W. W. and C. Clifford. Relationship of Self Concept to Beginning Achievement in Reading. U.S. Office of Education, Cooperative Research Project Number 377, Wayne State University, Detroit, 1962.

Williams, R. L. and S. Cole. "Self Concept and School Adjustment." Personnel and Guidance Journal. 1968, 46:478-81.

# APPENDIX I

## Experimental Design

Students were originally assigned to Core classes by means of a table of random numbers. However, a few pupils were reassigned for administrative reasons. Below are the research designs. R stands for random assignment, O for pre-testing, $O_2$ and $O_3$ for post-testing, and X for the laboratory treatment.

Sixth Grade Design:

| | | |
|---|---|---|
| R | $O_1$ X $O_2$ | Required |
| R | $O_1$ $O_2$ X $O_3$ | Required |

Eighth Grade Design:

| | | |
|---|---|---|
| R | $O_1$ X $O_2$ | Required |
| R | $O_1$ X $O_2$ | Voluntary |

Ninth Grade Design:

| | | |
|---|---|---|
| R | $O_1$ X $O_2$ | Required |
| R | $O_1$ X $O_2$ | Required |
| R | $O_1$ X $O_2$ | Required |

Eleventh Grade Design:

| | | |
|---|---|---|
| R | $O_1$ X $O_2$ | Voluntary |
| R | $O_1$ X $O_2$ | Voluntary |
| R | $O_1$ X $O_2$ | Required |

APPENDIX II

Materials and Costs

| | TOTAL COST | YEARS OF LONGEVITY | COST FOR ONE YEAR |
|---|---|---|---|
| **Equipment:** | | | |
| 8 Jr. Controlled REaders (EDL) | $1,680.00 | 10 | $168.00 |
| 6 Reading Accelerators (SRA) | 389.70 | 10 | 38.97 |
| 5 Flash-X Machines (EDL) | 41.00 | 5 | 8.20 |
| 12 Carrels (Sch. Equip. Dist.) | 1,400.34 | 10 | 140.34 |
| 2 Record Players (Trumble Co.) | 135.00 | 5 | 27.00 |
| 1 Dukane Filmstrip and Record Player Combination (Brandon's) | 179.00 | 5 | 35.80 |
| 1 Dukane Filmstrip and Cassette Combination (Brandon's) | 203.00 | 5 | 40.60 |
| 2 Cassette Recorders (Thurow Electronic) | 70.00 | 5 | 14.00 |
| 6 Earphones (Trumble Co.) | 38.10 | 5 | 7.62 |
| 2 Stopwatches (Zipp Co.) | 37.90 | 3 | 12.64 |
| 1 File Cabinet | 60.00 | 10 | 6.00 |
| | $4,234.04 | | $499.17 |
| **Materials:** | | | |
| Rate -- | | | |
| 1 Set Rapid Reading Folders (Local production) | 20.00 | 5 | 4.00 |
| 45 Controlled Reader Books (EDL) 3C 3E 5GH 5LJ 4KL 4MN 3D 4F 5HG 5JI 4LK | 90.00 | 3 | 30.00 |
| 11 Controlled Reader Filmstrips (C through MN) (EDL) | 962.50 | 5 | 192.50 |
| 2 Maxwell Skimming and Scanning (McGraw-Hill) | 8.91 | 3 | 2.97 |
| 5 Brown Efficient Reading (Heath) | 19.74 | 3 | 6.58 |
| 15 Better Reader Books (SRA) | 44.25 | 5 | 8.85 |
| Vocabulary -- | | | |
| 2 Volumes Vocabulary Records (Scott, Foreman) | 30.00 | 5 | 6.00 |
| 9 Word Clues Books (EDL) | 19.80 | 3 | 6.60 |
| 8 Flash-X Cards (EDL) | 28.80 | 5 | 5.76 |
| 1 Set Wordcraft Vocabulary (Communicad) | 80.00 | 3 | 26.67 |
| 1 Set Bergen Evans Vocabulary (Communicad) | 120.00 | 3 | 40.00 |
| 3 Grow in Word Power (Reader's Digest) | 4.60 | 3 | 1.20 |
| 2 Basic Vocabulary Skills (McGraw-Hill) | 7.92 | 3 | 2.64 |

| | TOTAL COST | YEARS OF LONGEVITY | COST FOR ONE YEAR |
|---|---|---|---|
| Comprehension -- | | | |
| 1 Set Listening Skills Program (SRA) | $ 90.00 | 5 | $ 18.00 |
| 1 Set Listen and Think Tapes (EDL) | 60.00 | 5 | 12.00 |
| 1 IIC Reading Laboratory (SRA) | 68.96 | 4 | 17.24 |
| 1 IVA Reading Laboratory (SRA) | 68.96 | 4 | 17.24 |
| 1 Senior Reading for Understanding Kit (SRA) | 41.94 | 3 | 13.98 |
| 1 Junior Reading for Understanding Kit (SRA) | 41.94 | 3 | 13.98 |
| 4 Sets 88 Passages Books (College Skills) | 6.60 | 3 | 2.20 |
| 4 Sets 100 Passages Books (College Skills) | 8.16 | 3 | 2.72 |
| 1 Set Skill Building Books (Barnell-Loft) | 19.32 | 3 | 6.44 |
| 5 Reading for the Main Idea Books (McGraw-Hill) | 12.51 | 3 | 4.17 |
| 5 Critical Reading Improvement Books (McGraw-Hill) | 14.75 | 3 | 4.92 |
| 10 Advanced Reading Skill Builders (Reader's Digest) | 20.10 | 3 | 6.70 |
| 10 New Reading Skill Builders (Reader's Digest) | 20.10 | 3 | 6.70 |
| 12 Scope Skill Builders (Scholastic) | 12.80 | 3 | 4.27 |
| | $1,922.66 | | $464.33 |
| Miscellaneous: | | | |
| Diagnostic Reading Test (Triggs) | $ 80.00 | 2 | $ 40.00 |
| Secretarial Time and Materials | 300.00 | 1 | 300.00 |
| Repair to Equipment | 72.40 | 1 | 72.40 |
| | $452.40 | | $412.40 |
| Total Cost for Equipment, Materials, and Miscellaneous: | $6,609.10 | | $1,375.90 |
| Staff Cost: | | | |
| Salaries | $6,000.00 | 1 | $6,000.00 |
| Consultant Fee | 750.00 | 1 | 750.00 |
| | $6,750.00 | | $6,750.00 |
| TOTAL COST FOR ONE YEAR: | | | $8,125.90 |

## Publisher's Names and Addresses

Barnell-Loft, Ltd.
111 South Centre Avenue
Rockville Centre, New York 11570

Brandon's Inc.
1027 Mary Street
Jacksonville, Florida 32207

College Skills Center
101 West 31st Street
New York, New York 10001

D. C. Health and Company
285 Columbus Avenue
Boston, Massachusetts 02116

McGraw-Hill Book Company, Inc.
Manchester Road
Manchester, Missouri 63011

Reader's Digest Services, Inc.
Educational Division
Pleasantville, New York 10570

Scholastic Book Service
Scholastic Magazine, Inc.
904 Sylvon Avenue
Englewood Cliffs, New Jersey 07632

School Equipment Distributors, Inc.
319 Monroe Street
Montgomery, Alabama 36104

Science Research Associates, Inc. (SRA)
259 East Erie Street
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## APPENDIX III

### Diagnostic Reading Test

The Diagnostic Reading Test by Triggs was used in pre and post evaluation of comprehension, rate, and vocabulary. This test has been extensively and somewhat critically reviewed in the fourth and sixth editions of the Mental Measurements Yearbook (Buros, 1953, 1965).

The following instrument data are given in the 1967 revision of the Diagnostic Reading Test Manual (p. 42). The reliability of each score is reported there as follows:

| UPPER LEVEL | | LOWER LEVEL | |
|---|---|---|---|
| Rates of Reading | .80 | Booklet I - Word Attack | .85 |
| | | Comprehension | .86 |
| Vocabulary | .89 | Total | .91 |
| Comprehension | .83 | Booklet II - Vocabulary | .90 |
| Total | .91 | Rates of Reading | .80 |

### GHD Scale

The GHD Scale, an attitude toward reading scale, developed at P. K. Yonge, was given for one class each of sixth, eighth, and ninth graders before and after treatment.

### Student Evaluation Form

The Student Evaluation Form, a self report instrument also developed at P. K. Yonge for use in this specific project, was given to all students at the end of the program.

APPENDIX IV

Workshop Model

Personal involvement is the keynote in the training of counselor-teachers for an assignment in a reading laboratory. During the workshop, participants go through the experience of being students in a developmental reading laboratory at their own level of competency. During the first session, a standardized reading test is administered and graded. Later, there is an interpretation of scores based on college norms. Counseling and goal-setting is experienced by each participant while he is developing his own individualized reading program. The philosophy, methodology, and materials are studied within this framework during the remainder of the sessions.

As the role of the teacher is not the same in the laboratory setting, differences between a teacher-learner environment and a learner-counselor situation are clarified. This includes an analysis of the dynamics of learning and discussions of the major learning theories. A philosophical approach to counseling involves participants in understanding some of the principles of motivation and some specific techniques related to task-oriented counseling. Case study evaluations and role-playing implement assimilation of attitudes and processes that are important in the success of the program.

There is a brief review of simple statistical concepts that are related to the interpretation of test scores. This includes an understanding of evaluation instruments, percentile ranks, norms, and progress expectancies. This body of information is most effectively used to stimulate motivation and to promote general feelings of confidence in students.

An exploration of materials is likely to be more meaningful to the participants if it applies to their own needs. Later, this knowledge can be used in helping students at whatever level they are functioning. As most of the reading materials are sequentially developed for depth of ideas and difficulty of specific

skills, each participant will be improving his own reading skills. He explores the degree of success that is necessary to enhance feelings of adequacy. He can experience unsuccessful attempts also and learn ways of utilizing "failures" to stimulate further growth.

The mechanics of running a developmental reading laboratory are important aspects of the program. During the workshop, techniques of administering tests, record-keeping, program-planning, and the setting up of individual folders is discussed. The writing of brief notes to students after reviewing daily progress seems to be particularly meaningful to them. Examples of representative folders which include chronological remarks are available. The use of confidential counseling notes and the final reporting of results to the classroom teachers is clearly defined, also.

A final session includes a discussion of the relative place of the reading laboratory experience within the total school curriculum. An individualized reading program should be visualized as a direct aid to the classroom teacher. Reading skills that are being developed need to be integrated into the classroom experience and contribute to the recreational aspects of reading. A reading laboratory can only be effective if it is a cooperative effort of the entire faculty.