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Abstract

The purpose of this study was to investigate the initial one-year effects and the second-year follow-up effects of introducing programmed English as a Second Language into the elementary curriculum. The initial phase or Phase I was concerned with determining the effect of English as a Second Language (ESOL) on the achievement of first year elementary students. The follow-up study phase was designed to determine the extent of any residual effects on the achievement of second, third, and fourth grade students receiving the programmed ESOL instruction during the academic year just preceding the year considered by this report. Achievement areas involved were reading vocabulary, reading comprehension, total reading scores, mathematical reasoning, math fundamentals, and total mathematics scores. The subjects were students from culturally disadvantaged Negro homes enrolled in the Laboratory School on the campus of the Mississippi Valley State College. It was found that no valid judgement could be rendered regarding the effectiveness or non-effectiveness of the programmed ESOL materials used. Due to the contamination of the control group, no true analysis was possible. More than one year of ESOL would be needed to determine the permanent effects, if any, on the achievement of the students. (DO)

RESEARCH MONOGRAPH

English as a Second Language

Leflore County, Mississippi

SOUTH CENTRAL REGION EDUCATIONAL LABORATORY

RESEARCH MONOGRAPH

English as a Second Language

Leflore County, Mississippi

Project conducted by South Central Region Educational Laboratory, Little Rock, Arkansas, in cooperation with the Mississippi Valley State College and the Institute for the Exceptional Children, University of Illinois.

ENGLISH AS A SECOND LANGUAGE FOR THE CULTURALLY DEPRESSED CHILDREN AT ROGERS SCHOOL, LEFLORE COUNTY, MISSISSIPPI

I. INTRODUCTION

The public school educational system in the United States has been charged with the responsibility for developing effective, efficient, and productive citizens in a democracy. In recent years, sociological, economical, and technological developments in the United States have placed significant pressures on our better school systems as they struggle to meet the needs of their students. Obviously, school systems in socio-economically depressed areas have been able to meet these needs to a lesser extent than the schools in the more fortunate areas. The territory served by SCREL included many of these depressed rural areas and schools. Concomitant to the occurrence of economically depressed areas was the high frequency of culturally and economically deprived children. SCREL identified three subcultures in the region. The Mississippi Delta Negro children were identified as one group.

The Negro Rogers Laboratory School in Leflore County, Mississippi, at the Mississippi Valley State College was the concern of this project. The project offered English as a Second Language to the first grade students using programmed instructional materials (Bereiter and Engelmann) as a part of the SCREL basic compensatory early childhood education program during the 1968-69 academic year. English as a Second Language

was introduced to study the effects of attempting to teach desired language use in order to eliminate the disadvantages associated with dialected language use which is common with culturally deprived children.

II. STATEMENT OF THE PROBLEM

The purpose of this study was to investigate the initial one-year effects and the second-year follow-up effects of introducing programmed English as a Second Language into the elementary curriculum. The initial phase or Phase I was concerned with determining the effect of English as a Second Language on the achievement of first year elementary students. The follow-up study phase of Phase II was designed to determine the extent of any residual effects on the achievement of second, third, and fourth grade students receiving programmed English as a Second Language instruction during the academic year just preceeding the year being considered by this report. Achievement areas involved were:

a) reading vocabulary

b) reading comprehension

c) total reading scores

d) math reasoning

e) math fundamentals

f) total mathematics scores

III. METHOD

A. Population

The target population for this study was the first, second, third, and fourth grade students enrolled in the Laboratory School on the campus of the Mississippi Valley State College. Insofar as Phase I of this study was concerned, only the first grade students received the experimental treatment, (Phase I) English as a Second Language, in 1968-69. The second, third, and fourth grade students represented the follow-up groups, (Phase II) and they had received English as a Second Language during the previous academic year (1967-68).

Approximately 95 percent of the students from Rogers School are from the surrounding rural farming areas. All students were from culturally disadvantaged Negro homes. Mississippi Valley State College and the Laboratory School were situated in Leflore County, Mississippi, eight miles west of Greenwood, the county seat of Leflore County, and one mile north of Itta Bena, a small city of 2,000 population in Leflore County, Mississippi, is located in the heart of the Northwestern section of Mississippi known as the Delta. The Delta covers six million acres of lush, flat lands that include 18 counties. The primary source of income is through agricultural activities. The population of Leflore County (1960 census) was 47,000 person. Approximately 16,000 persons are in the age bracket five through 19. The total

area of Leflore County is 588 square miles with 118 school buses required to transport pupils in the county to the various schools.

Leflore County has more than 7,000 pupils in grades one through twelve, approximately 1,000 are Caucasian and approximately 6,000 are Negro. Approximately 90 percent of the pupils are in grades one through six. This very high dropout rate is a strong indication that present public school programs do not adequately meet the needs of children they are designed to serve.

B. Objectives

The general objectives of the South Central Regional Educational Laboratory are pupil objectives, namely the development of self-concept and basic skills of culturally disadvantaged children. In this particular study, a more specific objective was to develop adequate communication skills in standard English with rural culturally disadvantaged Negro elementary students. These skills are defined by Engelmann (1967) in terms of child behavior:

1. He is able to follow basic instructions presented either verbally or in writing;
2. He is able to construct instructions verbally or in writing,
3. He is able to understand descriptions and definitions of reality presented either verbally or in writing; and
4. He is able to construct descriptions verbally or in writing.

Other objectives were to increase reading skills: a) reading vocabulary, b) reading comprehension, and c) total reading scores, as measured by the California Achievement Test and arithmetic skills as measured also by the California Achievement Test in regard to: a) math fundamentals, b) math reasoning, c) total math achievement.

Yet another objective was to determine if there was retention from the previous year of the programmed materials taught in English as a Second Language which could be identified as influencing second, third, and fourth grade achievement in the same reading and mathematical areas measured by the California Achievement Test mentioned above.

C. Hypotheses

Phase 1. Each hypothesis was stated in the null form.

Hypothesis 1: There will be no significant difference between the classroom mean IQ scores on the W.I.S.C. at the beginning of the year.

Hypothesis 2: There will be no significant difference between the pooled experimental groups and the control group of first grade students when the adjusted mean California Achievement Test scores are compared controlling for initial differences on the WISC verbal and performance scales in the areas outlined.

Hypothesis 3: There will be no significant difference in the mean gain score between the control and experimental groups on the California Achievement Test in these six areas.

Hypothesis 4: There will be no significant difference between groups at the beginning, nor at the end, of the academic year on the Otis-Lennon I.Q. Scores.

Hypothesis 5: There will be no significant difference between the single mean of the control group as compared to the pool mean of the three experimental groups on the Otis-Lennon and the California Achievement Tests at the end of the academic year.

D. Hypotheses: Phase 2 Follow-up

Each hypothesis was stated in the null form.

Hypothesis 1: There will be no significant gain from the beginning to the end of the follow-up academic year between the control group and the experimental group in the second and third grades, respectively, on the California Achievement Test scores with regards to the six areas mentioned.

Hypothesis 2: There will be no significant difference between the mean of the control group and the mean of the experimental group in the second, third, or fourth grades respectively at the end of the follow-up academic year, on the scores of the California Achievement Test with regard to:

a) reading vocabulary

b) reading comprehension

c) total reading scores

d) mathematics reasoning

e) mathematics fundamental

f) total mathematics

RESULTS

Analysis of the Data

The data used to test each null hypothesis were collected by the staff of SCREL. The data were analyzed by the Research Measurement Center at Iowa City, Iowa and by the SCREL Staff using pooling programs and the Ollivetti Programma 101 Computor. Each of the hypotheses was tested for significance at the .05 level of confidence.

Phase I.

Hypothesis 1: There will be no significant difference between the control group and the pooled experimental groups of first grade students, with respect to classroom mean I.Q. scores on the WISC in the beginning of the year.

The analysis of variance methods were used to analyze the data relative to this hypothesis. Table I Page 17 summarized the results of the analysis comparison of the mean test scores of the four classrooms.

The F value required for significance was 2.70 because the obtained F value was 1.41. Hypothesis 1 was not rejected.

Hypothesis 2: There will be no significant difference between the pooled experimental groups and the control group of first grade students when the adjusted mean California Achievement Test scores are compared controlling for initial differences on the WISC verbal and performance scales in the areas outlined.

Table II. Page 17 summarized the results of an analysis of programs of the data concerning Hypothesis 2. The mean of the control class on the WISC verbal and performance was 82.96 and 74.04 respectively whereas the pool mean of the experimental classrooms was 81.77 and 80.06 respectively. These values were used to adjust the mean scores on the California Achievement Test. The a, b, c, and d components of Hypothesis 2 were rejected at the 0.01 level of confidence. The means of the control group for each component were: reading vocabulary 45.67, reading comprehension 2.92, total reading 48.58, math reasoning 23.00, math fundamentals 26.17, and total math 46.12 whereas the respective pool experimental means were reading vocabulary 34.85, reading comprehension 1.16, total reading 36.02, math reasoning 17.12, math fundamentals 22.29, and total math 39.44. The e and f component, math fundamentals, and total math, were not rejected. The a, b, c, and d subdivisions of this hypothesis were rejected since the mean achievement of the control group as measured by the California Achievement Test was significantly greater than the pooled mean achievement of the experimental groups. The F values required at the 0.05 and 0.01 levels of confidence respectively were 3.96 and 6.96. Only the F values for component a, b, c, and d exceed the values required for significance.

Hypothesis 3: There will be no significant difference in the mean gain score between the control and the experimental groups on the California Achievement Test in the relevant areas.

Tests were used to compare the mean of California Achievement Test gain scores of the control group to each of the three experimental classrooms consistently designated as E1, E2, and E3. T values required for rejection using the appropriate degrees of freedom was 2.02 and 2.70 at the 0.05 and 0.01 levels of confidence, respectively. When the T test was made, the mean gain of the control group exceeded the mean gain of the E1 classroom in reading comprehension and total reading (0.01 level) and in reading vocabulary and math reasoning at the (0.05 level). Likewise the control group exceeded the E2 classroom in math reasoning (0.01 level) and in reading comprehension and total reading (0.05 level). Also, the control exceeded the E3 classroom in reading comprehension (0.01 level) and in math reasoning (0.05 level). Therefore, these aspects of the hypothesis were rejected at the respective levels of confidence with the mean gain of the control greater than the experimental. All other aspects of this hypothesis were not rejected.

Hypothesis 4: There will be no significant difference between groups at the beginning, nor at the end, of the academic year on the Otis-Lennon I.Q. Scores.

T tests were used to compare the mean of the control and each of the means of the three experimental classrooms. The calculated T required at the 0.05 and 0.01 levels of confidence were 2.02 and 2.07, respectively. When the T test of the beginning of the year I.Q. scores was made, the mean I.Q. of the control classroom was greater than the E1 and E3 experimental classrooms (0.01 level), the E2 experimental classroom (0.05 level). Therefore, this

hypothesis was rejected with respect to equality of the groups at the beginning of the year with the control classroom having a significantly higher mean I.Q. as determined by the Otis-Lennon test scores.

A test of the mean I.Q. scores between experimental classrooms yielded a significant difference at the 0.05 level of confidence between the E1 and E3 classrooms with the E3 classroom mean I.Q. score being greater. Therefore, there was a significant difference between the E1 and E3 classrooms but no further significant differences between the experimental classrooms were detected by utilizing the T test at the beginning of the year.

The T test analysis of the mean I.Q. of the classrooms at the end of the academic year indicated that the control classroom mean I.Q. was greater than the E1 classroom (0.01 level)but was not significantly different from E2 or E3 classrooms. Therefore, the hypothesis was rejected for the E1 classroom and the hypothesis was not rejected for the E2 and E3 classrooms at the end of the academic year with respect to I.Q. scores as measured by the Otis-Lennon tests.

Hypothesis 5: There will be no significant difference between the single mean of the control group as compared to the pooled mean of the three experimental groups on the Otis-Lennon and on the California Achievement Tests at the end of the academic year.

A T test was used to compare the Otis-Lennon mean I.Q. scores of control group to the pooled Otis-Lennon mean I.Q. score of the experimental groups, the control mean was found to be significantly

greater (0.01 level). Therefore, this aspect of the null hypothesis was rejected. Also, the control mean Otis--Lennon I.Q. was significantly greater than that of the experimental group at the end of the year.

When the mean California Achievement Test scores of the control group was compared to the pooled mean California Achievement Test scores of the experimental group, the mean of the control group was significantly greater with respect to reading vocabulary, reading comprehension, and total reading (0.01 level) and significantly greater with respect to math reasoning at the end of the academic year (0.05 level). Consequently these aspects of the null hypothesis were rejected; all other aspects of the hypothesis were not rejected.

Phase 2.

Hypothesis 1: There will be no significant difference in gain from the beginning to the end of the follow-up academic year between the control group and the experimental group in the second and third grades, respectively, on the California Achievement Test scores with regard to:

a) reading vocabulary

b) reading comprehension

c) total reading scores

d) mathematics reasoning

e) mathematics fundamentals

f) total mathematics

The T tests failed to reveal significant differences in mean gain

scores in achievement scores on the California Achievement Test with respect to the second or third grades, respectively, this null hypothesis was not rejected.

Hypothesis 2: There will be no significant difference between the mean of control group and the mean of the experimental group in either the second, third, or fourth grades, respectively, at the end of the follow-up academic year on the scores of the California Achievement Test with regard to:

a) reading vocabulary

b) reading comprehension

c) total reading scores

d) mathematics reasoning

e) mathematics fundamentals

f) total mathematics

T-tests were used to analyze data collected by administering the California Achievement Test to all students in the second, third, and fourth grades. The control students and experimental students the previous year were identified for each separate grade level and the scores were proved for each grade level regardless of the classroom that the students had been assigned to during the follow-up academic year. When the second grade control mean was compared to the experimental mean, the control mean was found significantly greater at the 0.01 level of confidence in math fundamentals and greater at the 0.05 level of confidence in total math. The null hypothesis regarding math fundamentals and total math was rejected. All other components of null hypothesis

regarding achievement scores on the California Achievement Tests was not rejected for the second grade follow-up students.

The mean of the third grade control group was compared with the mean of the experimental group (the students receiving English as a Second Language instruction during the previous year) without regard to the student's location in the classroom. The control mean in reading vocabulary, reading comprehension, and total reading, and math reasoning as determined by the California Achievement Test was significantly greater at the 0.01 level of confidence. Hence, this component of the null hypotheses was rejected. The results revealed the control mean to be significantly greater in all six areas concerned (0.01 level). The null hypotheses were rejected entirely regarding the fourth grade follow-up student achievements in reading and math as measured by the California Achievement Test with the control group having the greater mean achievement scores.

DISCUSSION:

The basic objective for introducing programmed instruction in English as a Second Language was to develop adequate communication skills in standard English with rural culturally disadvantaged Negro elementary students. The increase in language understanding was measured in the areas of reading and mathematics with the California Achievement Test.

The first grade at the Rogers Laboratory School of the Mississippi Valley State College was the target population for Phase 1 of this study (receiving instruction in English as a Second Language during the 1968-69 school year). Further, a follow-up study of second, third and fourth grade students who had received programmed instruction in English as a Second Language during the previous academic year (1967-68) was considered as Phase 2 of this report.

One of the first points to be considered was the inconsistency between the analysis of the WISC test results and the Otis-Lennon test results for the first grade students during the 1968-69 academic year. There was no significant difference between the classrooms with the WISC test but the Otis-Lennon test indicated a significantly greater mean I.Q. for the control with significances between classrooms. No objective explanation was available for this results. However, the WISC results were considered to be more valid. The students were randomly assigned to the four classrooms, but during the treatment period extraneous contamination of the control group was evident. The control classroom was reportedly chosen as an experimental group for a project administered by persons other than the SCREL staff. The control for this study also acting as a treatment for another experimental program deviated from the design prescribed for the English as a Second Language study conducted by SCREL. The effects of this deviation, along with possible teacher differences, could account for the superior performance of the control in this study.

There is evidence to suggest that the students were not assigned to the experimental and control groups on a random basis during the treatment period (1967-68 academic year). While test data were not available, observations by professional educators indicated that the control groups selected for the 1967-68 academic year in the first, second, and third grades were in fact superior initially to the students assigned to the experimental classrooms who received English as a Second Language during 1967-68. This possibly accounts for the results obtained. Since mean gain scores did not differ significantly, the results indicated that when significant differences in posttest means were identified, the greater mean belonged to the control group.

The retention of acquired skills was only evident in the second grade if truly identified there. However, educators should expect the younger child to be more favorably influenced by a program such as the English as a Second Language program.

The analysis of the data and the evidence supplied to the consultant who interpreted these data and prepared this report would support the following conclusions:

No valid judgement can be rendered regarding the effectiveness or non-effectiveness of the Bereiter--Engelmann Programmed Instruction in English as a Second Language materials used. Due to the contamination of the control group, no true analysis was possible. More than one year of English as a Second Language would be needed to determine the permanent effects, if any, on the achievement of students. Subjective judgements indicated that the motivational level was high but compensatory effects probably would have been greater at the preschool level.

TABLE I

Analysis of variance of mean WISC total I.Q. scores between first grade classrooms.

Source	Sum of Squares	d.f.	Mean Square	F
Between Classrooms	583.2158	3	194.40	1.41
Error	11,581.6820	85	137.87	
Total	12,164.8978	88		

TABLE II

Analysis of covariance of mean California Achievement Test reading and math scores adjusted for initial differences in WISC mean scores.

Identification	Results of Analysis				
Phase I; Ho 1 Subdivision	Source	Sum of Squares	d.f.	Mean Square	F
A Reading Voc.	Tmt (Diff for Test)	1,650.38	1	1,650.38	14.37*
	Error (W)	9,418.77	82	114.86	
	Total	11,069.15	83		
B Reading Comp.	Tmt (Diff for Test)	51.28	1	51.28	17.81*
	Error (W)	236.1600	82	2.88	
	Total	278.4446	83		
C Reading Total	Tmt (Diff for Test)	2,283.5469	1	2,283.55	17.55*
	Error (W)	10,669.9766	82	130.12	
	Total	12,953.5234	83		
D Math Reasoning	Tmt (Diff for Test)	444.5664	1	444.57	8.28*
	Error (W)	4,401.6758	82	53.68	
	Total	4,846.2422	83		
E Math Fundamentals	Tmt (Diff for Test)	221.2734	1	221.27	1.24 N.S
	Error	14,693.3203	82	179.19	
	Total	14,914.5937	83		
F Math Total	Tmt (Diff for Test)	475.8906	1	475.89	1.51 N.S
	Error	25,905.0195	82	315.91	
	Total	26,380.9102	83		

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