ACHIEVEMENT IN SCHOOLS EMPLOYING NONGRADED, MODIFIED TRADITIONAL, AND SELECTIVE GROUPING PLANS OF ORGANIZATION

Leon R. Culpepper
Bibb County Public Schools
Macon, Georgia

One of the recent philosophies regarding grouping students for instruction is that of nongraded classes in which the traditional grade boundaries are eliminated. Although most authorities in education agree with the underlying philosophy of the nongraded program, there is some apprehension among some as to the actual results that can be attained by this plan. School authorities decided that two of the twenty-five white elementary public schools in Bibb County, Macon, Georgia, would adopt on an experimental basis the nongraded plan at the beginning of the 1961-62 school term. The experiment would run for a period of three years and the nongraded classes would be extended upward one grade each year.

Purpose and Scope of the Study

The purpose of this investigation was to make a three-year study comparing student achievement in the primary grades of schools using three different philosophies of grouping pupils for instruction. This report covers the results of the first two years of the study. The two schools employing the nongraded plan were designated as E-1 and E-2. In addition to the experimental schools, two control schools were chosen. Control school, C-1, employed a modified traditional method of grouping first grade pupils for instruction; and control school, C-2, used a selective grouping procedure based on reading readiness and mental ability.

Background Information on the Project Schools

E-1 school was built in 1953 in a newly developed section in the northern part of the city. Students attending this school come from homes where the family income is a little above average and the socio-economic status of this community would be classified as a little above middle class. This school was one of the two experimental schools adopting the nongraded plan. Eighty-five pupils made up the three sections of the first grade at the end of the first year of the experiment.

All but six of the original eighty-five students were still enrolled at the end of the second year of the study. The mean I. Q. of the students, based on the California Test of Mental Maturity administered in January, 1962, was 111 with a mean mental age of 84.

E-2 school, the other experimental school initiating a nongraded plan of organization, was built in 1954 in a newly developed section in the eastern part of the city. The income of families whose children attend this school is in the average group and the socio-economic status of this community is considered as middle class. One hundred and ten students made up the four sections of the first grade at the end of the 1961-62 school term. Ninety-three of the original students were enrolled at the end of the 1962-63 term. None of the pupil losses at either of the experimental schools was due to failure since the nongraded plan does not require a specific amount of work to be accomplished at a specific level or in a specific amount of time. The mean I. Q. of students at this school was 105 and the mean mental age was 82.

C-1 school was built in 1956 in a newly expanded area in the western section of the city. The socio-economic status of this community is considered middle class. Eighty-two pupils made up the three sections of the first grade during the 1961-62 term while only sixty-eight of the original group participated in the 1962-63 school year. Five of the fourteen pupil losses were due to failures and scores from these pupils were not included in the second year of the study. Achievement tests were administered only to second graders at the end of the 1962-63 term; therefore, the scores of the five pupils who were repeating the first grade were not available for inclusion in the data used for making achievement comparisons. The mean I. Q. of students at this school was 105 and the mean mental age was 84. This control school used the modified traditional plan of grouping pupils for instruction.

C-2 school was built in 1954 in a newly developed area in the southern section of the city. Students attending this school come from homes where the family income is average and the socio-economic status of this community is considered middle class. The five sections of the first grade had an enrollment of 138 pupils at the end of the 1961-62 school term. Only 101 of the original students were included in the study at the end of the 1962-63 term. Thirteen of the thirty-seven pupil losses were due to failures. At this control school the selective grouping method was used for placing students in classes for instruction. The mean I. Q. of these students was 106 and the mean mental age was 84.

Definition of the Plans of Organization

Nongraded

E-1 and E-2 schools used every available means of obtaining information about pupils entering the first grade in September, 1961. Students were classified by means of readiness tests, chronological age, mental maturity tests, and knowledge of older brothers and sisters who had been enrolled in that school previously. The students were placed in selected groups of approximately thirty pupils and were allowed to progress at their own rate of ability. There were no grade boundaries, no minimum nor maximum amount of material to be covered, nor were formal report cards used. A different teacher was assigned to the various groups for the second and third year; however, pupils were still allowed to work at their own level of ability.

Modified Traditional

The traditional method of randomly dividing the total number of students entering the first grade by the number of first grade classrooms was used to assign pupils to their first grade teachers. The manner of teaching reading was a deviation from the traditional concept. During the first eighteen weeks of school each teacher instructed her own pupils in all areas. At the end of the eighteenth week the Metropolitan Readiness Test was administered to all first grade students by the classroom teachers. The principal and all first grade teachers held a conference as soon as the tests were graded and, using the test results plus the knowledge of the progress of pupils to that point, divided the students into three different levels of readiness for reading. Students were not re-assigned to a different home room as a result of this new classification by the teachers and principal since it pertained only to readiness for reading. For the first hour and one-half each day, teacher "A" would take the "ready group," teacher "B" would take the "partially ready group," and teacher "C" would take the "not ready group" and teach reading. Thereafter, for the first hour and one-half of each school day, students from the various sections of the first grade visited the designated teacher of their group for instruction in reading. At the conclusion of the reading period, all students returned to their regular home room and their own classroom teacher taught them the remainder of their studies.

Selective Grouping

Students were grouped into three levels according to reading ability. Two first grade classes were classified as the "fast" group, two classes

were classified as the "average" group and one class, where supplemental and remedial reading techniques were employed, was classified as the "slow" group. Each of the five teachers taught all of the first grade material to her own class. At the end of the first year, all but thirteen pupils were promoted to the second grade where a similar selective grouping was continued.

Procedure

The Pre-Primary California Short Form Test of Mental Maturity was administered to the 415 first grade pupils in the four project schools in January, 1962. The mental maturity test scores were transformed into an expected achievement score using the California Anticipated Achievement Calculator. This provided an expected achievement score for each student based on his mental maturity. This score was expressed in terms of grade placement. Since the expected achievement was based on mental maturity the effect of differences in mental ability among students in the four schools was held to a minimum. During the first week of May, 1962, the California Achievement Test Battery, Form W, was administered to all first graders in the four project schools. This test provided an actual achievement score for each child and was also expressed in terms of grade placement. A comparison of the expected achievement scores with actual achievement scores revealed that the actual achievement scores exceeded the anticipated achievement scores in most cases. It should be pointed out that expected achievement predictions of the California Anticipated Achievement Calculator are based on national norms.

A gain score was obtained for each pupil by subtracting his expected achievement score from his actual achievement score. Gain scores were obtained in reading vocabulary, reading comprehension, arithmetic reasoning, arithmetic fundamentals, mechanics of English, spelling, and for the total battery.

Anticipated achievement scores for the second year were obtained by converting the mental age scores obtained in January, 1962, to intellectual status indices and applying these indices to the grade two anticipated achievement calculator. In May, 1963, all students who were in the second year or second grade were given the California Achievement Test, Form X, and their scores on this test were compared with their anticipated scores for the second grade. Similarly,

a gain score was obtained by subtracting the expected score from the actual score.

The statistical treatment of the data was the same for both years and the null hypothesis was always tested. The individual total battery gain score for each pupil furnished the basis for all computations.

Findings

Analysis of variance was used to investigate between group differences. The F test indicated that there was significant difference between groups with regard to gain in achievement. The Hartley test of homogeneity disclosed no significant differences in the mean and variance of the population of the four schools. (1) Differences between pairs of groups were investigated with t tests. The results of these tests appear in Table 1.

Table 1

Results of t Test Comparisons of the Mean Achievement Gain among Students in the Four Project Schools for 1961-62 and 1962-63 School Terms

Comparison of Student Achievement in Schools	t Scores	
	1961-62	1962-63
E-1 and E-2	-1.14	0.88
E-1 and C-2	0.71	1.51
E-1 and C-1	2.86*	2.53*
E-2 and C-2	1.85*	0.63
E-2 and C-1	3.50*	1.84*
C-2 and C-1	2.14*	1.41

*Significant at .05 level.

There were significant differences in the mean achievement gain of students in both of the experimental schools and students in one of the control schools (modified traditional) at the end of the 1961-62

term. There was a significant difference between the gain among students at E-2 school and students at both the control schools. A significant difference occurred between the control school using the selective grouping plan and the control school using the modified traditional plan. For the 1962-63 school term, Table 1 reveals a significant difference in the mean achievement gain among students at both of the experimental schools and the control school using the modified traditional plan. Although other differences in the amount of gain were evident, none was statistically significant.

Conclusions

The experiment was designed to make statistical comparisons of student achievement in the four project schools at the end of each year for a period of three years. It was expected that the results of these comparisons would indicate not only whether or not there were any significant differences in achievement among students attending schools employing different methods of grouping pupils for instruction but would also determine whether the differences, if any, remained constant or changed from year to year.

The hypothesis that the mean achievement gain by students in the four schools would be equal was tested. Based on the findings at the end of the first year, the following was found to be true:

1. The mean achievement gain of pupils at E-2 school was greater than that of the other three schools.

2. The difference in mean achievement gain by students at E-2 school and by students at both of the control schools was statistically significant.

3. The mean achievement gain of students at E-1 was significantly different from the mean achievement gain among students at C-1, one of the control schools.

4. The mean achievement gain of students at C-2 school, where a selective grouping plan was used, was significantly different from the mean achievement gain of students at C-1 school, where a modified traditional plan was used.

5. The differences in the mean achievement gain among students at the two experimental schools were not statistically significant.

6. The differences in the mean achievement gain among students at E-1 school and C-2 school were not statistically significant.

At the end of the first year, thirteen pupils at C-2 school and five pupils at C-1 school failed and were required to repeat the first grade. There were no failures in either of the experimental schools because the classes were not graded.

Of the total number of students who were enrolled in the various schools at the end of the first year, 93% of the pupils at E-1, 85% of the pupils at E-2, 73% of the students at C-2, and 83% of the pupils at C-1 participated in the experiment at the end of the second year.

Based on the statistical findings at the end of the second year the following was found to be true:

1. The mean achievement gain of pupils at E-1 was greater than that of the three other schools.

2. The mean achievement gain of students at E-2 was greater than that of the two control schools.

3. The mean achievement gain of students at E-1 and E-2 was significantly different from the mean achievement gain of students at C-1.

4. The gain of students at C-2 was greater than that of students at C-1 but was not significant.

Summary

For two consecutive years the mean achievement gain of students attending the two nongraded schools has been greater than the two control schools. For two consecutive years the differences between the mean achievement gain of students at both nongraded schools and the control school using the modified traditional plan of organization have been statistically significant.

Footnote

1. Helen M. Walker and Joseph Lev, Statistical Inference (New York: Henry Holt and Company, 1953), pp. 192-194.