EFFECT OF DEPARTMENTALIZATION IN ELEMENTARY SCHOOL ON PUPIL ACHIEVEMENT

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The purpose of this report is to present data describing the achievement of elementary school pupils during one year when they were taught in self-contained classrooms and their achievement during the following year when they were taught in departmentalized classes. The professional literature bearing on the comparative advantages in terms of pupil achievement of these two organization schemes is scanty. It is hoped that results presented here constitute a first step toward gaining knowledge about the comparative educational advantages of these two patterns.

Procedure

Subjects

The population from which the sample was selected consisted of all students, from three Brevard County elementary schools, who had completed sixth grade in 1960 and who had been taught on a departmentalized basis in the sixth grade and who had been taught the preceding year, while in fifth grade, in self-contained classrooms. One hundred pupils were chosen randomly from the larger group as defined above.

Test Data

Subjects had been administered the Stanford Achievement Tests, Intermediate Battery, Form K, at the end of fifth grade, and Form J of the same test at the end of sixth grade.

Analysis

Test battery median scores were analyzed to determine answers to two general questions. First, what proportions of students scored below or above actual grade placement each year, what proportions scored below or above one year and not the other. Second, for students who scored either above or below actual placement each year, in which year was the discrepancy greater.

Results

The data which appear below describe changes from one year to the next with regard to differences between actual grade placement and grade placement as indicated by test norms.

		1960 Grade Placement	
		Above	Below
1959 Grade Placement	Above	40	16
	Below	14	30

A chi square of 16.3 was obtained from these data. It is significant at the .05 level of confidence, thus indicating the data for each year were not independent.

Further analyses of the data revealed that of those students who scored at levels greater than their grade placements each year, sixty per cent had the greater discrepancy during the second year. Of those students who scored below placement each year, ninety-four per cent had a greater discrepancy in 1960.

Conclusions

The data revealed for these particular students that type of organization--self-contained classrooms and departmentalized classes--was not associated with achievement differences as determined by discrepancies between actual and test indicated grade placement. The data dealing with when the greater discrepancy occurred between actual and test indicated placement are congruent with the notion of rate of change, i.e., if a student is slightly behind, or ahead, this year (his rate of learning is less, or greater, than average), then he will be even farther behind, or ahead, at some future time. Therefore the greater discrepancies should be expected during the second year. Thus one cannot infer from the data that the departmentalized organization altered in any way the expectations of achievement that one would normally hold for a group such as the one studied.

At best, the results are highly tentative, owing to the small sample of students and the brevity with which they were exposed to the "departmentalized treatment," and should be regarded more as a stimulant to further research than a substantive contribution to knowledge about the educational effect of the organization patterns.

IN-SERVICE EDUCATION OF TEACHERS IN RELATION TO CLASSROOM ADJUSTMENT OF THE UNDERCHOSEN CHILD[1]

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The Troy Child Growth and Development Research Study was designed to determine the effects of teacher participation in an in-service program emphasizing child development concepts upon teacher and pupil attitudes and behavior. Especial interest lay in underchosen children and the advances they may make in social adjustment and acceptance and improvement they may undergo in academic achievement.

Participation in in-service programs has been assumed, either tacitly or otherwise, to effect changes in teachers' knowledges and attitudes. The further assumption has generally been made that informational and attitudinal changes are translated into behavioral changes with respect to the content and goals of such programs and that consequent changes in pupil behavior may result. Although relatively few carefully controlled investigations have examined the entire sequence of processes beginning with teacher training and ending with pupil behavior, much of the available evidence supports the assumptions underlying the various segments of the sequence (Abrahamson, 1952; Anderson and Zimmerman, 1950; Brandt and Perkins, 1956, 1957; Elkins, 1951; Gordon, 1959; Hall, 1951; Jennings, 1948; McClelland and Ratliff, 1947; Prescott et al., 1945).

In the present study, twenty-one hypotheses, stated in null form and grouped under five headings, were tested. Each hypothesis referred to the relationship between experimental and control groups with respect to a measurable variable. The hypotheses are herein phrased, for the sake of brevity, in terms of principal processes examined.

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Hypotheses

Teacher behavior

(a) Attitudes of acceptance and objectivity in dealing with pupils

(b) Accuracy in identifying least- and most-chosen children at the beginning of the year

(c) Accuracy in identifying least- and most-socially-emotionally adjusted children at the beginning of the year

Time in in-service program and accuracy in identifying pupils

(a) Relation of length of in-service participation to accuracy in identifying least- and most-chosen children

(b) Relation of length of in-service participation to accuracy in identifying least- and most-adjusted pupils

Teacher attitude and pupil changes in adjustment and achievement

(a) Relation of change in adjustment of underchosen pupils to teacher attitude change

(b) Relation of change in achievement of underchosen pupils to teacher attitude change

Pupil behavior

(a) Change in peer-acceptance of underchosen children

(b) Change in achievement of underchosen children

(c) Change in social-emotional adjustment of underchosen children

Effects of concerted study of underchosen children upon all children

(a) Change in achievement of all children

(b) Change in social-emotional adjustment of all children

Method

Subjects

Forty-six pairs of female teachers and their 2286 pupils participated in the program. The teachers in each pair were matched on the basis of age, amount of collegiate training, length of teaching experience, grade level taught, and socioeconomic environment of the schools in which they worked. No attempt was made to match experimental and control pupils, other than the selection of control schools located in communities similar to those of the corresponding experimental schools.

Procedure

The forty-six experimental teachers took part in a six-year pre-experimental program in which the primary objectives were those of exploration of major problems associated with child study; orientation of participants; enlisting the services of specialists; formulation of specific goals; and development on the part of teachers of study skills such as administering and interpreting sociometric tests, selecting and observing a child to be studied, and writing anecdotal records. The seventh year, which actually covered a period of seven months, consistuted the experimental phase of the study. During this period, experimental teachers participated in three general conferences held on the Troy State College campus and nine study-group meetings held in the teachers' respective counties. The following topics were treated in these meetings:

1. Planned study of anecdotal records.

2. Direct teacher action with underchosen children using such procedures as remedial teaching, recognition of positive child behavior, clinical conferences, and other techniques arrived at through group discussion.

3. Direct dealing with other pupils in the group as they affect the underchosen child, using such procedures as reassignment of work or play groups and classroom discussion of topics such as "Helping those who have few friends."

4. Planned parent-teacher conferences and home contacts.

5. Use of specialists through classroom visitation and counseling.

Throughout the training program a number of basic child growth and development concepts were emphasized as being important in determining classroom procedures. Illustrative of the concepts included are:

(a) one's self-concept influences learning; (b) children learn at different rates; (c) emotional, social, and physical as well as intellectual needs of children must be met; and (d) each child's behavioral patterns originate in interaction of his abilities, motivations, and experiences.

Data were collected from control and experimental teachers and pupils at the beginning of September and again in the middle of the following April. Two kinds of data were obtained from teachers: (a) scores made on the Minnesota Teacher Attitude Inventory (MTAI) and the Purdue How I Teach: Analysis of Teaching Practices (Purdue) and (b) teachers' predictions of ranks certain of their pupils would receive on the sociometric test and the California Test of Personality (CTP). On the twenty-first day after the beginning of the school year all teachers were asked to nominate, in rank order, five pupils from each of the following categories: pupils who would (a) receive the most choices on the sociometric test, (b) receive the fewest choices on the sociometric test, (c) make the highest total adjustment scores on the CTP, and (d) make the lowest total scores on the CTP. Pupils in each of the experimental and control classrooms were tested at the beginning and at the end of the experimental period by means of the California Achievement Tests (CAT) and the CTP. The .05 level was used in all tests of significance.

Results

The first group of hypotheses dealt with teachers' behavior. Covariance analyses of MTAI and Purdue scores revealed that experimental and control teachers did not differ significantly in extent of change in attitudes of acceptance and objectivity in dealing with children. Since raw score means of experimental teachers exceeded significantly those of control teachers in the fall and in the spring on both the MTAI and the Purdue, gains were given additional treatment after having been expressed in terms of proportion of possible gain in order to take into account the fact that some teachers could not possibly have shown as much progress as other teachers. This treatment is shown in Table 1. A t test of the difference between mean proportionate gains of experimental and control teachers yielded additional support to the null hypothesis.

The higher mean score of the experimental teachers in identifying least-chosen children and the lower mean score in identifying most-chosen children did not differ significantly from corresponding accuracies of control teachers as indicated in Table 2. Neither did the two teacher groups differ significantly in accuracy in identifying least- and most-adjusted children, as measured by the CTP.

The second group of hypotheses related to length of in-service participation and accuracy in identifying least- and most-chosen pupils as well as lowest- and highest-scoring pupils on the CTP. Gross treatment

Table 1

Analysis of Covariance of Fall and Spring Minnesota Attitude Inventory and Purdue: How I Teach Scores of Experimental and Control Teachers

Source of Variation	MTAI				Purdue			
	df	Adjusted y^2	Mean Square	F	df	Adjusted y^2	Mean Square	F
Between means	1	117.80	117.80	.45	1	57.28	57.28	2.99
Within groups	89	23281.43	261.59		89	1702.76	19.13	
Total	90				90			

Table 2

Analysis of Variance of Accuracy with Which Experimental and Control Teachers Identified Least-Chosen and Most-Chosen Pupils and Lowest-Scoring and Highest-Scoring Pupils on the California Test of Personality

Group	Source of Variation	df	Sum of Squares	Mean Square	F
Least-chosen	Between means	1	.0066	.0066	.73
	Within groups	90	.8122	.0090	
Most-chosen	Between means	1	.0005	.0005	.14
	Within groups	90	.3167	.0035	
Lowest CTP	Between means	1	.0004	.0004	.02
	Within groups	90	2.3333	.0259	
Highest CTP	Between means	1	.0049	.0049	.27
	Within groups	90	1.6113	.0179	

of data revealed no significant relationship between the two variables. However, analyses of accuracy scores categorized according to length of in-service participation yielded more positive results. Mean accuracy of .964 in identifying least-chosen pupils of those who participated three years was significantly higher than the mean accuracy of .900 of those who had participated two years. The mean accuracy of .966 in identifying most-chosen pupils of those who participated four or more years was significantly higher than the mean accuracy of .929 of those who participated two years. It was therefore concluded that accuracy in identifying least- and most-chosen children was related to length of in-service participation. Analyses of accuracies in identifying lowest- and highest-scoring pupils on the CTP, stratified according to length of in-service participation, yielded results which supported the null hypothesis.

The third group of hypotheses dealt with extent of teacher attitude change and extent of underchosen pupil changes in adjustment and achievement. Table 3 shows that the differences between mean gains of pupils in CTP performance categorized according to magnitude of changes in MTAI scores of their teachers were not significant. Analyses of teacher MTAI and pupil CAT scores also yielded negative results.

Table 3

Analysis of Variance of Underchosen Pupil Change in Performance on the California Achievement Tests and the California Test of Personality Categorized According to Changes in Teacher MTAI Scores

Test	Source of Variation	df	Mean Square	F
CAT	Between means	3	.4133	.97
	Within groups	88	.4242	
CTP	Between means	2	300.94	.50
	Within groups	89	604.77	

The fourth group of hypotheses related to pupil behavior. The experimental and the control groups of underchosen children increased significantly in proportion of peer choices from the beginning to the end of the experimental period, indicating the operation of factors in both groups contributing to increased peer acceptance. The difference between group mean gains, however, was not significant (Table 4). The two groups, as indicated in Table 5, were found not to differ significantly in mean gains in achievement and social-emotional adjustment.

Table 4

Adjusted Spring Means of Experimental and Control Pupil Frequency of Peer Choices

Statistic	Group		Difference Between Means	Difference Required for Sig. at .05
	Experimental	Control		
Adjusted Spring Mean	3.12	2.61	.51	3.94

Table 5

Difference in Mean Gain in California Achievement Test and California Test of Personality Performance Between Experimental and Control Underchosen Children

Test	Statistic	Group		t
		Experimental	Control	
CAT	Mean gain	16.67	12.61	.82
	SD	24.38	23.41	
CTP	Mean gain	5.61	7.48	.38
	SD	22.62	23.92	

The fifth group of hypotheses dealt with the presumably salutary effect of concerted teacher study of underchosen children upon achievement and adjustment of all pupils. Positive results were obtained at certain grade levels when CAT scores were stratified by grade. At the first-grade level, the control group adjusted spring mean of 86.25 was found to be significantly higher than the experimental group adjusted spring mean of 74.52. The adjusted spring mean of 71.45 of the experimental third grade was significantly higher than the corresponding mean of 66.37 of the control third grade. However, since the variance ratio of initial experimental and control scores was highly significant at the first-grade level, the observed difference between the two groups may be accounted for on the basis of differing variances rather than differing means.

Variances of third-grade experimental and control data were homogeneous. When t test was applied, the superiority of third-grade experimental pupils over the corresponding control pupils was shown to be significant.

Covariance analysis of CTP scores stratified by grade showed that the control fourth-grade adjusted spring mean of 113.61 exceeded significantly that of 106.84 of the experimental group. No other differences were significant. An F test of the variances of initial CTP scores supported the assumption of equal variances. The conclusion was drawn that the in-service program was not successful in bringing about changes in pupil adjustment in any of the grades and that factors were operating to a greater extent in the control than in the experimental fourth grade to produce improved social-emotional adjustment.

Discussion

In view of the predominance of nonconclusive evidence derived from the study, consideration may be given to examining the entire experimental process one step at a time, using more sensitive measuring instruments and allowing a longer period of time than that used in the present study for the operation of experimental conditions. Thus, the first step would be to determine if the in-service training program does in fact alter teacher knowledge and attitudes. If so, the second step would be to ascertain by means of a classroom observational procedure whether or not change in teacher knowledge and attitudes results in changed classroom behavior. The third step would consist of a more extensive and precise measurement of pupil behavior in order to detect more subtle behavioral changes which may result from interaction with in-service teachers. A research sequence such as this may make possible the identification of points at which breakdown occurred in this study.

Summary

The Troy Child Growth and Development Study sought to determine the effects of an in-service program emphasizing child development concepts upon the attitudes and behavior of teachers and their pupils. Experimental and control teachers did not differ significantly in extent of change in attitudes of acceptance and objectivity, as measured by the MTAI and the Purdue, from the beginning to the end of the seven-month experimental period. Gross treatment of data indicated that the program did not improve experimental teacher accuracy in identifying least- and most-chosen children. But treatment of data categorized according to length of in-service participation showed that identification accuracy improved with increase in length of training. The program did not improve teacher accuracy in identifying least- and most-adjusted pupils, as measured by the CTP. Experimental and control underchosen children did

not differ in gain in number of peer choices. Both groups underwent significant improvement. Therefore, the in-service program did not improve social acceptance of underchosen children. Experimental pupils in Grade 3 made significant advances over control pupils in achievement as measured by the CAT. The program did not improve pupil social-emotional adjustment scores on the CTP. On the contrary, factors appeared to be operating in the control fourth grade which led to greater adjustments than in the corresponding experimental grade.

More research is needed to determine the effects of each phase of the program and whether a longer experimental period would produce different results. The variables under consideration are complex and developmental in nature and may conceivably require much more than a seven-month period to produce measurable qualitative differences.