DOCUMENT RESUME

ED 062 297 SP 005 667

AUTHOR	Kallenbach, Warren; Carmichael, Dennis
TITLE	The California Teacher Development Project for Systems of Individualized Instruction: Individualizing Inservice Education.
PUB DATE	Apr 72
NOTE	14p.; Speech given before the Annual Meeting of the American Educational Research Association (Chicago, April 1972)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Administrator Education; *Group Instruction; *Individualized Instruction; *Inservice Programs; *Inservice Teacher Education; Instructional Innovation

ABSTRACT

The major objectives of this project were a) to facilitate teacher role changes necessary for transition from a group-paced to an individualized program, b) to develop a parent information and orientation program, c) to identify needs necessary for a transition of teacher roles, and d) to develop an instrument to analyze teacher performance in systems of individualized instruction. Teachers and students representative of all grade levels except kindergarten in five California school districts and parochial schools of the Catholic Archdiocese of San Francisco participated in the study. Project programs used systems approach techniques, while in-service activities were generated from needs assessment and problems analysis. Performance requirements were established and program budgeting and time management techniques were used as project management tools. The results showed a significant positive change in parent and teacher attitude and knowledge of individualized instruction. Attitudes and achievement of the students in the classrooms of experimental group teachers seldom exceeded those of students in the classrooms of control group teachers and were sometimes significantly below them in attitude toward school environment and achievement in language, reading, and math. (MJM)

3/72

The California Teacher Development Project for Systems of Individualized Instruction: Individualizing Inservice Education*

by Warren Kallenbach, San Jose State College, and Dennis Carmichael, Milwaukie (Ore.) Schools

The California Teacher Development Project for Systems of Individualized Instruction, a Title III ESEA project, was funded in 1968. Teachers and students representative of all grade levels except kindergarten in five California public school districts and the parochial schools of the Catholic Archdiocese of San Francisco participated in the Project. The participants are representative of all facets of the broad socio-economic spectrum of the San Francisco Bay Area. Project programs and organization were designed using systems approach techniques. Inservice activities were generated from needs assessment and problem analysis. Performance requirements were established. Program budgeting and time management techniques (PERT/CPM) were used as project management tools.

GOALS AND GENERAL OBJECTIVES

The major objective of the Project was to develop a teacher and administrator inservice program to facilitate role changes necessary for teachers in transition from group-paced to individualized instruction.

Other objectives included the development of a parent information and orientation program to provide parents with an understanding of the rationale for individualized instruction; the identification of needs that are necessary in teachers making the transition from group-paced to individualized instruction; and the development of an instrument to analyze teacher performance in systems of individualized instruction.

The teacher and administrator inservice program is designed to provide teachers with the skills needed to individualize instruction so that each pupil (1) will work at a rate commensurate with his assessed capacity; (2) will use individually prescribed learning materials and media; and (3) will pursue learning objectives that are determined in accordance with his diagnosed needs and capabilities.

The purpose of the parent orientation and information program is to build support for a program that will facilitate each student's performance and consequent learning in an individualized instruction program.

TEACHER INSERVICE NEEDS SURVEY

The assessment sampled teachers who were currently involved in individualized instruction having already made the transition from group-paced to individualized instruction.

Teachers sampled were individualizing through the following ways: pacing (varying the rate of learning for each pupil); materials (varying learning materials for each pupil); and objectives (varying objectives for each pupil). The teachers were drawn from the elementary and secondary schools in the San Francisco Bay area and from selected areas in the state.

The inservice needs assessment which included data from an extensive research literature survey resulted in the identification of the following ten major need areas:

*Paper read at Annual Meeting of the American Educational Research Association, Chicago, Illinois, April 5, 1972.

Teacher Inservice Needs Survey, continued

1. The need for a commitment and an orientation to individualization by both the teacher and the students.

2. The need for assistance in preparing behavioral objectives.

3. The need for assessing student capabilities to provide the basis for appropriate individualized pacing, objective setting and programming.

4. The need for assistance in transforming material into a program that will achieve the behavioral objectives.

5. The need for improving the quality of the learning environment for the students.

6. The need to have available and know the location of a variety of instructional media and materials.

7. The need to obtain the cooperation of school administrators and fellow teachers.

8. The need for efficient methods of record-keeping and evaluation of student progress.

9. The need for added clerical and instructional assistance such as paraprofessionals.

10. The need for a parent orientation program and on-going information program to inform parents and encourage their support of individualized instruction.

These need areas formed the basis for establishing new inservice program objectives. The program objectives in turn became the basis for the development of the eleven different inservice program components comprising a five-day inservice workshop for teachers and administrators.

INSERVICE PROGRAM

The teacher and administrator inservice workshop has emerged as a completely individualized workshop in which each participant selects the five or six components with which he intends to work for a four- or five-day period. Each of the components was prepared to satisfy one or more of the identified needs. They are learning activity packets or instructional modules in which are presented (1) a performance criterion test (used as both pre- and post-test), (2) primary idea learning objectives, (3) introductory reading material, and (4) several varied options to achieving the learning objectives.

In listing five or six components for a tentative workshop study schedule, the participant is, in effect, entering into a learning contract. The intent of the workshop developers was to place participants in a situation comparable to that which their own students might be encountering. The workshop resource materials have been obtained from many sources, but each component with but two exceptions was prepared by a teacher experienced in that area of individualized instruction, e.g., the teachers who prepared "Using Contracts in Individualized Instruction," had been successfully using contracts in their own classrooms for two years or more before writing that component.

EVALUATION PROCEDURES

The California Teacher Development Project Workshop for Individualizing Instruction was also designed to be conducted by other agencies and school districts. Before it was transported, however, certain outcomes had to be known. Do teachers participating in the workshop significantly increase the level of individualization in their classrooms? What effects does this individualization have, if any, on desired student learning outcomes? What significant differences, if any, does conducting the parent orientation program make?

The effectiveness of the workshop and parent orientation program in changing teacher, student, and parent cognitive and affective behaviors has been determined by EPIC Diversified Systems Corporation. EPIC System's first activity was to delineate objectives for the teacher and administrator in-service and the parent orientation programs. In all, ten objectives were so delineated. These objectives are specified in the Evaluation Reports below.

An evaluation design schematic with a time line was the second activity engaged in by EPIC Systems and the project staff.

The simplified listing of performance objectives and the schematic were invaluable tools in the management and effectiveness of the project.

EVALUATION REPORTS

Project findings, listed by objectives, are as follows:

Objective 1. The students in the California Teacher Development Project will exceed the language ability (.05 level) of the control group students as measured by the language sub-test scores of the State-adopted standardized achievement.

The Iowa Test of Educational Development was administered—pre and post—to students (grades 11 and 12) involved in the California Teacher Development Project and to a control group (same grades). The results were analyzed using a dependent t test on the gain scores (pre- and post-test) for the three subjects (Interpretation of Literature, General Vocabulary and Use of Information).

TABLE 1

Mean Gain Scores, Standard Errors and t statistics for Control and Experimental Groups (Grades 11-12) on the Iowa Tests of Educational Development

Sub-test	N	Mean Gain Scores		SE	t
		Control	Experim.		
Interpretation of Literature	16	- .63	0.06	8.71	.23
General Vocabulary	14	3.00	3.86	3.21	.48
Use of Information	16	3.13	2.35	4.60	.41

$t(.05, 1, 15) = 2.13$; $t(.05, 1, 13) = 2.16$

The difference in mean gain scores on each of three sub-tests of the ITED was not significant. The objective was not met in any of the three sub-tests using .05 level of confidence.

Objective 2. The students in the CTDP classrooms will exceed the reading ability (.05 level) of the control group students as measured by the reading sub-test scores of the State-adopted standardized test.

Pre- and post-testing of students involved in the CTDP and of students in comparable control groups were carried out at grade levels 2, 3, 4 and 6. A One-way Analysis of Co-variance was conducted on the data (grades 2, 3, 4, and 6) to determine if there was a significant difference between the post-test means of the experimental and control groups. The students pre-test scores were used as the covariate in the analysis. Tables 2 through 5 present the data and results of the analyses for Objective Two.

TABLE 2

Means (Pre- and Post-test) and F Values for the Reading Achievement Scores, Grade 2 (Cooperative Primary Test, 23-A)

GROUP	N	Reading Score	Reading Score	F Value
		Pre-test Mean	Post-test Mean	
Grade 2 Experimental Group	52	18.31	25.75	17.90*
Grade 2 Control Group	57	18.49	31.75	

* Significant at .05 level $F_{(.05, 1, 108)} = 3.94$

As can be observed in Table 2, the post mean of the control group exceeded that of the experimental group. The difference was significant at the .05 level. The objective for Objective 2 at Grade 2 was not accomplished.

TABLE 3

Pre- and Post-test Reading Achievement Scores for Grade 3 (Stanford Achievement Test) Primary II, Form X)

GROUP	N	Word Meaning		F Value	Paragraph Meaning		F Value
		Pre-	Post-		Pre-	Post-	
Grade 3 Experimental Grp	80	18.26	30.30	.0022	28.61	39.86	.5236
Grade 3 Control Group	88	17.42	28.83		27.44	40.22	

$F_{(.05, 1, 167)} = 3.91$

The differences between experimental and control groups mean post-test scores were not significant for word meaning and paragraphy meaning sub-tests. The objective was not accomplished for Grade 3.

TABLE 4

Pre- and Post-test Reading Achievement Scores for Grade 4 (Comprehensive Test of Basic Skills, Level II)

GROUP	N	Reading Vocabulary		F Value	Reading Comprehension		F Value
		Pre- Mean	Post-mean		Pre-Mean	Post-Mean	
Experimental	70	12.90	22.24	16.35*	15.43	23.16	10.09*
Control	59	16.29	23.22		19.98	30.22	

* Significant at .05 level $F_{(.05, 1, 127)} = 3.92$

The control group at the fourth grade level had higher post- mean scores in both reading vocabulary and comprehension. This difference in the post- mean scores for both sub-tests was significant at the .05 level. The objective was not accomplished for Grade 4.

TABLE 5

Pre- and Post-test Reading Achievement Scores for Grade 6 (Comprehensive Test of Basic Skills, Level II, Form R)

GROUP	N	Reading Vocabulary		F Value	Reading Comprehension		F Value
		Pre-Mean	Post-mean		Pre-Mean	Post-Mean	
Experimental	136	26.79	31.52	1.82	28.68	32.67	.396
Control	156	23.19	28.24		26.19	30.45	

$F_{(.05, 1, 289)} = 3.89$

The post- means of the experimental group in both reading sub-test areas are higher than the post- mean scores of the control group. However, in each case the difference is not significant and the objective cannot be considered accomplished at the sixth grade level.

Objective 3. The students in the CTDP classrooms will exceed the mathematics ability (.05 level) of the control group students as measured by the mathematics subtest scores of the State-adopted standardized achievement test.

Pre- and post-testing of students involved in the CTDP and of comparable control group students was carried out at grades 2, 3, 4, 5 and 6. A One-way Analysis of Co-variance was conducted on the data (grades 2, 3, 4, and 6) to determine if there were a significant difference between the post-means. The students pre-test score was used as the covariate in the analysis. Results for grades 3 and 6 are reported here as representative of the findings.

TABLE 6

Pre- and Post-test Arithmetic Achievement Scores for Grade 3 (Stanford Achievement Test--Primary II)

GROUP	N	Computation		F	Concepts		F
		Pre-Mean	Post-Mean	Value	Pre-Mean	Post-Mean	Value
Experimental	51	18.16	28.47	11.18*	19.82	33.26	1.28
Control	41	19.93	36.02		19.04	30.56	

* Significant at .05 level $F_{(.05, 1, 89)} = 3.96$

The experimental group had a higher post-test mean score for the arithmetic concepts sub-test than did the control group, however, the difference in post-test scores was not significant. The higher post-test mean score in computation achieved by the control group was significant at the .05 level. The objective for arithmetic achievement was not met by the third grade students in the CTDP.

TABLE 7

Pre- and Post-test Arithmetic Achievement Scores for Grade 6 (Comprehensive Test of Basic Skills, Level 2, Form R)

GROUP	N	Computation		F	Concepts		F	Application		F
		Pre-Mean	Post-Mean	Value	Pre-Mean	Post-Mean	Value	Pre-Mean	Post* Mean	Value
Experimental	132	31.27	36.77	2.19	20.50	22.84	7.39	11.38	12.43	15.68*
Control	36	32.56	38.94		20.92	25.11		12.03	15.89	

* Significant at .05 level $F_{(.05, 1, 165)} = 3.91$

Objective 4. The students in the CTDP will respond positively to the total school environment as measured by the EPIC Pupil Attitude Inventory (Grades 3-6) and the School Attitude Inventory (modified Nebraska Attitude Inventory, Grades 7-8)

Pre- and post-test administration of the EPIC Pupil Attitude Inventory was carried out for grades 3 through 6. Means and standard deviations for the scores by grade and for the total of the four grades were calculated for the experimental group. A proficiency level of 75% positive responses was established prior to post-testing as a criterion for judging the accomplishment of the objective. Students were expected to maintain or reach the proficiency level in order to accept the objective as being met. Table 8 presents these findings.

TABLE 8

Means, Standard Deviations and Per Cents for Pre- and Post-administrations of the EPIC Pupil Attitude Inventory (Experimental Group)

Experimental Group	N	Pre-Test Mean	Pre-Test SD	Per Cent Positive Responses	N	Post-Test Mean	Post-Test SD	Per Cent Positive Responses
Grade 3	57	25.63	5.87	76.75	54	25.65	5.83	77.72
Grade 4	56	28.00	4.36	84.84	88	26.84	5.32	81.33
Grade 5	32	16.97	7.89	51.42	42	14.02	9.32	42.48
Grade 6	94	23.60	6.01	71.51	117	22.89	8.06	69.36
Total of Grades 3-6	239	24.23	6.77	73.42	301	23.30	8.25	70.60

Grades 3 and 4 of the experimental group maintained positive responses above the 75% proficiency level established as measured by the pre- and post-administrations of the EPIC Pupil Attitude Inventory. The total mean score for grades 3-6 was reasonably stable, with both pre- and post-means a few percentage points below the established proficiency level, however, the objective is judged not being met.

TABLE 9

Mean Scores and Per Cent Positive Responses (Pre- and Post-test) for the School Attitude Inventory (Grades 7-8)

GROUP	N	Pre-test Mean*	Pre-test Per Cent Positive Responses	N	Post-test Mean*	Post-test Per Cent Positive Responses
Grades 7 & 8	117	32.5	62.5	115	34.7	66.7

* Possible number of positive (Yes) responses equal to 52

The post-test group mean scores of the combined seventh and eighth grade students involved in the CTDP was slightly higher than the pre-test group mean score as shown in Table 9, however, the mean score did not reach the criterion of 75% positive responses selected for objective attainment.

Objective 5. The teachers participating in the CTDP will apply skills mastered in the California Teacher Development Project as measured by a modified version of the CTDP Teacher Observation Scale (TOS).

Teachers were observed late in the spring of 1970 as a pre-test situation. A second observation of the teachers was made in the fall of the school year and a final observation was made in spring 1971. The per cent of time spent by teachers in Group-paced Instruction, Single Method Individualization of Instruction (Variations in Pacing, Materials or Objectives), and Multiple Method Individualization of Instruction (any combination of the Single Methods) was observed during each of the three observation sessions. The summary of these observations for the experimental and control groups is shown in Table 10.

TABLE 10

Individualization of Teaching Techniques Observed in Experimental and Control Groups Using the California Teacher Development Project Observation Scale (TOS)

GROUP	GROUPED INSTRUCTION		SINGLE METHOD INSTRUCTION		MULTIPLE METHOD INSTRUCTION	
	f	%	f	%	f	%
Experimental Group						
Spring 1970	5,635	85.52	439	6.66	515	7.81
Fall 1970	1,290	18.84	2,154	31.46	3,401	49.69
Spring 1971	1,008	15.32	1,138	17.29	4,432	67.37
Control Group						
Spring 1970	4,403	87.06	435	8.60	219	4.33
Fall 1970	4,383	84.21	580	11.15	242	4.64
Spring 1971	3,402	73.05	713	15.31	542	11.63

The Chi Square technique was used to determine the significance of the changes that occurred between observations suring spring 1970 and fall 1970, between spring 1970 and spring 1971, and between fall 1970 and spring 1971 for the experimental group. These comparisons and their Chi Square values are shown in Table 11.

TABLE 11

COMPARISONS OF TOS OBSERVATIONS FOR THE EXPERIMENTAL GROUP OF THE CTDP

Comparisons (Observations)	Chi Square Value
Spring 1970 - Fall 1970	5984.71*
Spring 1970 - Spring 1971	6634.11*
Fall 1970 - Spring 1971	478.75*

* Significant at .05 level

The Chi Square analysis demonstrates clearly that the changes between all three observations were significant at the .05 level. These changes (as reported in Table 10) show a consistent and substantial decrease in percentage of time spent in Grouped Instruction and an increase in Multiple Methods Instruction over the the observation periods. It is equally clear, even by inspection only, that the Control Group changes did not begin to approach the changes of the Experimental Group.

The direction of the changes and the significance of these changes for the CTDP group very clearly indicates that Obsective 5 of the CTDP was met.

Objective 6. The teachers participating in the CTDP will respond positively to the concept of individualized instruction as measured by the EPIC Individualized Instruction Inventory.

Teachers were given a pre-test during the initial phase of the inservice program, and upon completion of the inservice program the same instrument was administered as a post-test. A dependent t-test was used to determine the significance of the change in the teacher attitudes. The .05 level of confidence was used to determine the attainment of the objective. Possible score on the instrument was 104. The maximum possible score represents expression of the highest possible positive response by the teacher on each item of the inventory using a 4-3-2-1 point scale. Twenty-six items were used in scoring the inventory. Mean scores and t values for teacher scores on the EPIC Individualized Instruction Attitude Inventory are shown in Table 12.

TABLE 12

Mean Scores and t Values for Teacher Scores on the EPIC Individualized Instruction Attitude Inventory

	N	Pre-mean	Post-mean	t
CTDP Teachers	60	80.58	84.78	3.23*

* Significant at .05 level $t(.05, 1, 59) = 2.00$

The gain in the mean scores on the post-administration of the EPIC Individualized Instruction Attitude Inventory was significant. The teachers' positive responses did increase from pre- to post-testing. Objective 6 of the CTDP is judged to have been met.

Objective 7. The parents participating in the parent orientation program of the CTDP will respond more positively to the concept of individualized instruction as measured by the EPIC Parent Inventory: Affective Items.

The pre- and post-test means were calculated using a pre-determined scoring procedure based upon the project personnel's keying of items on the EPIC Parent Inventory as being positive or negative toward the program. The possible score for the pre-determined appropriate responses was eleven. An independent t-test was used to indicate if the change in the mean scores was significant (.05 level).

These mean scores and t-test values are shown in Table 13.

TABLE 13

Mean Scores (Pre- and Post-test) and t Statistic for EPIC Parent Inventory

	N	Pre-test Mean	SD	N	Post-test Mean	SD	t
Parent Responses	240	8.71	1.96	298	9.13	2.03	2.47*

* Significant at .05 level $t_{(.05,\ 2,\ 536)} = 1.96$

As evidenced in Table 13, the mean gain on the post-administration of the EPIC Parent Inventory was significant at the .05 level. Using this measurement as an indicator of objective accomplishment, this objective for the program was met.

Objective 8. Parents participating in the Parent Orientation Program will develop a knowledge of individualized instruction as measured by the EPIC Parent Inventory: Cognitive Items.

A group mean score was obtained for the EPIC Parent Inventory that was administered in the spring of 1971. A criterion of 80% was used to determine the extent of parent knowledge expected to consider the objective as being accomplished. Table 14 shows the outcomes of this analysis.

TABLE 14

Mean Score and Standard Deviation for the EPIC Parent Inventory: Cognitive Items

	N	Possible Score	Group Mean	Per Cent	SD
Parents	340	10	8.54	85.4	1.27

The figures presented in Table 14 show that Objective 8 was met. Using the criterion of 80% or higher correct answers for objective accomplishment, the group mean of 85.4% exceeds the expectations for the objective.

Objective 9. Teachers participating in the CTDP Inservice Training Program will develop knowledge of the techniques of individualized instruction as measured by the Fremont Test of Individualized Techniques.

The teachers participating in the inservice program were administered a pre- and post-test designed to measure the teachers' increase in knowledge of individualized instruction techniques. Attainment of the objective was

to be indicated if a significant gain was evidenced at the .05 level confidence, using a dependent t-test on pre- and post-test knowledge scores. Table 15 shows the results for these data analyses.

TABLE 15

Pre- and Post-test Means and Matched-Pairs t-test Results for the Fremont Test of Individualized Instruction

	N	Pre-test Mean	Post-test Mean	t Value
Teachers in the Inservice Program	62	31.39	42.41	12.38*

* Significant at the .05 level $t_{(.05, 1, 61)} = 2.00$

The results of the pre- and post-testing on knowledge of techniques of individualized instruction show that the objective to increase teacher knowledge was attained by a very substantial amount.

Objective 10. Students of teachers in the CTDP that are rated by the Teacher Observation Scale as being high on the individualizing scales will exceed the reading and mathematics ability (.05 level) of students of teachers rated low in individualizing by the Teacher Observation Scale (TOS) as measured by sub-test scores of the State-adopted standardized achievement test.

Teachers in the CTDP observed using the Teacher Observation Scale (TOS) were determined to be high or low in the use of individualized instruction techniques by identifying those teachers above the median score (high group) and those teachers below the median score (low group). There were not sufficient data to identify an extremely high and extremely low group.

The data were analyzed using a One-Way Analysis of Co-Variance to determine if there was a significant difference between the post means of the experimental high group and the experimental low group. The students' pre-test score was used as the covariate in the analysis. Table 16 shows the results of these analyses for grades 3 and 6, respectively.

TABLE 16

Pre- and Post-test Reading and Arithmetic Achievement Scores for Grades 3 and 6 of Teacher High and Teacher Low Groups

GROUP	N	Word Meaning		F Value	Paragraph Meaning		F Value
		Pre-mean	Post-mean		Pre-mean	Post-mean	
Grade 3 Students of Teacher High Group	29	20.86	38.86	70.25*	30.59	37.93	10.17*
Grade 3 students of Teacher Low Group	51	17.73	25.43		27.49	40.96	
		Reading Vocabulary			Reading Comprehension		
Grade 6 Students of Teacher High Group	84	28.81	30.44	7.07**	32.13	34.29	1.39
Grade 6 Students of Teacher Low Group	52	23.52	25.82		30.52	30.06	
		Computation			Concepts		
Grade 3 Students of Teacher High Group	28	20.36	30.18	.197	20.25	38.93	26.79***
Grade 3 Students of Teachers Low Group	23	15.48	26.39		19.30	26.35	
Grade 6 Students of Teacher High Group	23	35.52	40.00	2.09	22.91	25.48	3.29
Grade 6 Students of Teacher Low Group	109	30.34	36.00		19.99	22.30	

* Significant at .05 level $F_{(.05,\ 1,\ 77)} = 3.96$

** Significant at .05 level $F_{(.05,\ 1,\ 133)} = 3.92$

*** Significant at .05 level $F_{(.05,\ 1,\ 48)} = 4.04$

The results of the data analyses shows that the students of grade 3 teachers high in individualized instruction had a higher post-mean score on word meaning and the students of teachers low in individualized instruction had a higher post-mean score on paragraph meaning. For each result the difference was significant at the .05 level.

The objective was met for word meaning at the third grade level, but not for paragraphy meaning.

In the above, it should be noted that the F value resulting from the test for Homogeneity of Variance for Word Meaning was greater than three. Therefore caution should be used in interpreting the Analysis of Co-Variance data.

In both the reading vocabulary and reading comprehension, students of sixth grade teachers high in individualized instruction had higher post-mean scores. However, the difference was significant (.05 level) only in the reading vocabulary scores. The objective was met for vocabulary but not comprehension.

At the third grade level in arithmetic, students of teachers high in individualized instruction did achieve higher post-mean scores for both arithemtic computation and concepts. The difference in the post-mean scores was significant (.05 level) for concepts but not for computation. Objective 10 was accomplished by third grade students in arithmetic concepts only.

Post-mean scores of sixth grade students of teachers high in individualized instruction were higher in all the sub-tests (Computation and Concepts) than were the post-mean scores of students of teachers low in individualized instruction. However, none of the differences in the two post-mean scores was significant. The objective was not met by sixth grade students.

DISCUSSION OF RESULTS (TEACHER VARIABLE)

The major impact of the California Teacher Development Project was that of changing teacher behavior in terms of gaining knowledge about the techniques of individualized instruction, increasing positive responses toward individualized instruction, and, most important, increasing their application of individualized instruction techniques. Objectives five, six and nine reported in the Evaluation Reports of this report present the results of these predicted behavior changes. The teachers' percentage of time spent in utilizing multiple methods of individualized instruction increased to a great degree. The positive effect is very evident when comparing this change in the application of individualized instruction techniques with the minor changes demonstrated by the control group.

The limitations of greatest concern in measuring teacher behavior related to the objectives measuring teacher positive responses (EPIC Individualized Instruction Attitude Inventory) and teacher knowledge of individualized instruction techniques (Fremont Test of Individualized Techniques). The problem in drawing clear conclusions from the available data related for the most part to the instruments employed in the evaluation.

An additional problem was that of attempting to compare achievement of students in classrooms of teachers demonstrating varying degrees of application skills in individualized instruction technqques. No distinct high or low groups of teachers was evident from the post-test observations. The objective for applying techniques of individualized instruction was accomplished so well that comparisons of student groups was difficult to make.

DISCUSSION OF RESULTS (PARENT VARIABLE)

A special concern of the CTDP was the measurement and analysis of parent behavior. Objectives 7 and 8 of the evaluation report show the results of these efforts. Both parent objectives were met. The parents did develop a knowledge of individualized instruction at the proficiency level specified and did increase significantly in their positive responses to the program.

The limitations that affect the conclusions that may be drawn from the analysis of the Parent Orientation Program objectives relate directly to the instruments utilized. The lack of reliable and valid measures for these two objectives is of concern to those interpreting the results.

DISCUSSION OF RESULTS (STUDENT VARIABLE)

The objectives relating to the student variable of the California Teacher Development Project were concerned with their Language, Reading, and Mathematics achievement and their attitudes toward the school environment.

The first problem apparent in the evaluation related to the statemett of the objectives in the design. In odrer to consider the objectives accomplished, the experimental groups were expected to exceed the achievement level (.05 level of confidence) of the identified control groups.

The lack of consistency in the results of the achievement testing may, in fact, indicate that the results were due to the varying nature of the student groups rather than any specific treatment. Also, an extreme difference in many of the variances of the experimental and control groups proved the statistical tests applied to the data as being invalid. The control groups did exceed the experimental groups of the study in a number of cases even though the experimental groups achievement gains were positive and consistent.

Student achievement was also analyzed in terms of teachers judged high or low in the use of individualized instructional techniques. The results from this analysis supports the conclusion that achievement again may have been more related to the nature of the student groups rather than the treatment applied. No distinctly high or low teacher groups could be identified from the experimental population of the study which can be taken as a positive gain for the group.

A concern of the project was that of student attitude toward the school environment as a result of their teacher's involvement in the California Teacher Development Project. Although the objective was not met by the total experimental group of students when using the established criterion level, it should be noted that a reasonable degree of stability was evident in their responses. An additional comparison important to make is that both experimental and control groups of students were very similar in their response patterns.

All in all, California Teacher Development Project teachers and parent attitude and knowledge of individualized instruction changed significantly positive during the study and teacher application of individualized instruction techniques changed significantly in a very positive direction. Attitudes and achievement of the students in the classrooms of experimental group teachers seldom exceeded those of students in the classrooms of control group teachers and were, sometimes, significantly below them in attitude toward school environment and achievement in language, reading, and mathematics. It seems apparent that we can affect adult behavior some and student behavior little.