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### ABSTRACT

This summary is a condensation of a 119-page major research study. The project studied the effects of an experimental teacher training program designed to help teachers nurture creativity in their pupils during the initial year of a city school desegregation plan. A pretest-posttest control group design was employed. One-half of the teachers participated in an experimental in-service program throughout the school year while one-half did not. The sample group was composed of all fifth and sixth grade students and their teachers in the Harrisburg School District. The fifth grade contained 39 teachers and 945 pupils and the sixth grade contained 39 teachers and 887 pupils. The Pennsylvania Department of Education designed the nine 90-minute workshop programs into three parts: a) an introduction to psychosocial issues involved in pupil creativity, b) a review of the factors of pupil creativity which are under the teachers' control, and c) the presentation of practical alternatives which are available to teachers. Teachers and pupils were tested in the fall of 1970 and again in the spring of 1971. The in-service program was well received by the teachers. All but one teacher involved in the program experimented with the ideas and materials presented. (Related Document is SP 005 641.) (MJM)

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# Improvement of Pupil Creativity Via Teacher Training:

Summary Report

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## FOREWORD

This condensed report presents the minimum information necessary for understanding results of the research project. Technical data such as most of the statistical analyses have been deleted to increase ease of reading. The reader wishing to study these technical data should refer to the longer Final Report.

## ACKNOWLEDGEMENT

This project required effort and sacrifice on the part of a large number of people. The administration of the Harrisburg City School District donated time, space and manpower. The 5th and 6th grade teachers gave of their time unstintingly. Representatives of the Office of Basic Education, Pennsylvania Department of Education, spent long hours on the in-service program. The program instructors came from as far away as Massachusetts for little or no remuneration. Professor Dominic Fanani of Millersville State College, Professor Frederick Kerlinger of New York University and Professor Milton Rokeach of Michigan State University permitted free use of their measuring instruments and offered advice and encouragement.

We are sincerely grateful to all these people.

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## SUMMARY

This project studied the effects of an experimental teacher training program designed to help teachers nurture creativity in their pupils during the initial year of a city school desegregation plan. Pupils and teachers were randomly assigned to either the experimental or control treatments. Half of the teachers took part in a teacher training program based on the concepts of the open-democratic classroom. All 5th (714) and 6th (627) grade pupils and the 66 teachers were evaluated in the fall of 1970 and the spring of 1971.

Results of the study were:

1. Many significant differences among school buildings were obtained for pupil achievement and attitude. The same schools that were significantly higher in the fall were significantly higher in the spring.
2. Certain teacher variables such as experience and attitude correlated significantly with several pupil variables such as creative attitude and achievement in arithmetic.
3. Pupil race correlated significantly with achievement in the spring, but not in the fall.
4. No significant differences resulted between experimental and control groups.
5. Information was gathered on how to structure future teacher training programs. For example, teachers prefer workshops in the beginning of the school day rather than at the end. Also, the ability of consultants to communicate is more important than their expertise or knowledge.

## I. Problem

### A. Statement

The teacher-child relationship is the core of the educational experience. To maximize this experience the communication lines between the teacher and the child should be open and flexible. This study will assess the effect on the teachers and their pupils of a teacher-training experience concerned with teacher-pupil interaction.

### B. Objectives

The objectives of this study are:

To assess the effect of teacher training upon pupil Creative Ability, Creative Attitude, Self-Concept, Understanding Others, Citizenship, Vocational Maturity, Intellectual Achievement, Preparation for Change, Attitude toward School and Appreciation of Human Accomplishment.

To assess the effect of the training program upon the teachers' desire for an open-democratic classroom atmosphere.

To assess the relationship between the teachers' desire for an open-democratic classroom atmosphere and class mean gain in pupil variables.

## II. Procedure

### A. Design

The Pretest-Posttest Control Group Design (Stanley and Campbell, 1963) was employed. This design takes this form:

R O <sub>1</sub>	X	O <sub>2</sub>	Experimental Group
R O <sub>3</sub>		O <sub>4</sub>	Control Group

Thus, one-half of the teachers participated in an experimental in-service program throughout the school year and one-half did not. Both groups of teachers and their pupils were tested in the fall and again in the spring.

## B. Sample

The sample comprised all the 5th and 6th grade teachers and their pupils in the Harrisburg School District. In the 5th grade, there were 39 teachers and 945 pupils. In the 6th grade, there were 39 teachers and 887 pupils.

Harrisburg City School District has 7,688 pupils in the grade levels kindergarten through 6th grade. Nineteen per cent of the student body is rated as disadvantaged, according to Title I, ESEA criteria. This is a relatively high percentage for a district in the Commonwealth. At the same time, the district's market value per weighted average daily membership for the 1969-70 school year was \$18,348 which is relatively high for the Commonwealth. The high Title I percentage and market value indicate a district with wealth owned by nonresidential property holders. Thus, one could depict Harrisburg as a small city district with residents predominantly of lower socioeconomic status.

## C. Experimental In-service Program

The experimental in-service program consisted of nine 90-minute workshops. The central theme of the program was the teacher's role in pupil creativity. The specific topics of the workshops were value training, child development, teacher-pupil interaction, perception, communication, and classroom environment. Each workshop was coordinated by an instructor who was considered to be an expert in the topic of concern.

The program was designed by a project staff composed of professional educators from the Pennsylvania Department of Education. They designed a program composed of three parts: (1) an introduction to psychosocial issues involved in pupil creativity, (2) a review of the factors of pupil creativity which are under the control of the teacher, and (3) a presentation of practical alternatives which are available to the teachers.

It was felt that parts (1) and (2) would effectively incorporate knowledge and beliefs, while part (3) would review teaching strategies.

A typical workshop included an introduction of the topic by the instructor. After presenting the basic theoretical rationale for the session, an attempt was made to involve the teachers. Depending on the type of workshop, this involvement varied from discussion and interaction with the instructor to work sessions in which the teachers participated in activities recommended for classroom use.

#### D. Instrumentation

All of the 5th and 6th grade pupils and teachers in the Harrisburg City School District were tested in the fall of 1970 and again in the spring of 1971. The teachers completed the Kerlinger Education Scales and the Rokeach Dogmatism Scale.

The 5th grade pupils completed the Pennsylvania Pupil Questionnaire and the Stanford Achievement Test which were combined to form Pennsylvania's Educational Quality Assessment Battery, and the Fanani Hidden Figures Test. The 6th grade pupils completed three subscales of the Pennsylvania Pupil Questionnaire.

#### E. Statistical Analyses

The relationship between teacher and pupil variables was investigated by means of correlational techniques. The effect of the teacher training program upon teacher and pupil variables was investigated by means of analysis of covariance. The .05 level of significance was deemed acceptable.

### III. Discussion of Results

#### A. 6th Grade Pupils

The 6th grade pupils completed three subscales of the Pennsylvania Pupil Questionnaire in both fall and spring administrations, receiving scores for Self-Concept, Understanding Others and Creative Attitude. Group

mean scores on each subscale were computed for the entire control and experimental groups as well as for each separate school building.

Both the control and experimental group mean scores on all three variables increased over the period of the study, but there were no significant differences between the control and experimental groups in 6th grade.

When the mean scores of the eight separate buildings were compared, differences among buildings were apparent. In the fall testing, scores on the measure of Understanding Others showed significant differences among buildings. These differences disappeared in the spring testing. The increased similarity among buildings suggests a trend toward equality of educational results throughout the district in terms of learning to understand and accept others who are different.

Creative Attitude and Self-Concept scores also showed definite differences among buildings. Although significant differences did not appear in the fall testing, the gain scores were significantly different, indicating that growth in both Creative Attitude and Self-Concept may be related to some condition which differs from school to school. An investigation of the causes of superior gains in higher scoring buildings would be beneficial for the district. The close relationship found between Creative Attitude and Self-Concept scores suggests that in program planning these variables should be considered together.

#### B. 5th Grade Pupils

The 5th grade pupils completed eight subscales of the Stanford Achievement Test, the Pennsylvania Pupil Questionnaire, and the Fanani Hidden Figures Test in both the fall and spring administrations. Group mean scores for control and experimental groups as well as the eight

separate school buildings were computed on pretest, posttest and gain scores. The Pennsylvania Pupil Questionnaire yielded scores on Self-Concept, Citizenship, Understanding Others, Creative Attitude, Attitude toward School, Vocational Maturity, Preparation for a Changing World and Appreciation of Human Accomplishment. The Fanani Hidden Figures Test gave a score on Creative Ability.

For all eight scales of the Stanford Achievement Test, and the eight measures of the Pennsylvania Pupil Questionnaire and the Fanani Test, there were no significant differences between the control and experimental groups. This indicates that the treatment did not significantly affect the 5th grade pupils' achievement or attitudes.

There were significant differences among the eight buildings on all but one of the achievement measures and all but two of the attitude measures at the beginning of the school year. The data on teacher sex and experience support the pupil data in indicating an inequality among buildings. The conclusion was that 5th graders in the eight buildings cannot be spoken of as academically equal in the fall of 1970.

The spring results show that inequity among the buildings was maintained on those variables measured by the eight scales of the Stanford Achievement Test, the Creative Ability scale and in the affective areas of Self-Concept, Citizenship and Creative Attitude. In the area of pupil Preparation for a Changing World, the buildings were not significantly different in the fall, but by spring the differences had increased in magnitude enough to be significantly different.

In the areas of Understanding Others, Attitude toward School and Vocational Maturity, the schools were significantly different in the fall

but not in the spring. This was a desirable finding since Understanding Others is a measure of attitude toward those different from one's own ethnic group, and improved understanding of different others is implicitly a goal of a desegregation plan. The universal gains in Attitude toward School were also desirable within the context of goals set by the school district.

The relationships among 5th grade pupil variables also were tested by correlational techniques. The preponderance of significant relationships between achievement and attitude measures reflects the considerable influence of the affective domain in the educational sphere.

The pretest of Understanding Others related significantly to the posttest of Creative Attitude. The pretests and posttests were also significantly related.

The relationships of pupil race to five scales of the Stanford Achievement Test were significant in the spring but not the fall. It appears that the academic programs were more effective with white than black pupils. The lack of significant correlations on the attitude measures suggested that this effect is purely cognitive and not affective.

### C. Teachers

In the fall and the spring the 5th and 6th grade teachers completed the Kerlinger Education Scales and the Rokeach Opinion Survey. The Kerlinger instrument produces two scores, ESA and ESB. The ESA scale measures a teacher's attitude toward the open-democratic classroom; the ESB scale measures a teacher's attitude toward the closed-traditional classroom. The Rokeach Scale measures the dogmatic, or authoritarian, nature of a teacher's attitude.

The experimental treatment did not have a significant effect on the 5th or 6th grade teachers. At both grade levels there was a trend away from dogmatic attitudes in both the experimental and control groups.

Although the difference was not statistically significant, the 5th grade control group displayed a loss on both of the education scales which did not appear in the experimental group. This suggests that the experimental treatment tended to maintain the teachers' attitudes over the year. While it was originally desired that the program significantly change teacher attitudes, one must consider the worth of such programs if they succeed in preventing possible losses during the school year because of such factors as accumulated fatigue.

The socioeconomic data of the teachers were analyzed in reference to the variables measured by the study. Older, more highly paid teachers were more dogmatic, and the program was better received by younger, non-university and female teachers. The program effects were greater for teachers living in urban areas than those in suburban areas.

The data relating job satisfaction to socioeconomic status indicate that the more highly paid experienced teachers are more satisfied than the newer teachers. However, these same more highly paid, experienced teachers apparently do not feel as involved with the school's activities as do the newer teachers. Job satisfaction was also highly related to classroom practices. The teacher who is satisfied with the job and feels he has high professional volition uses innovative practices regularly. These interrelationships of the specific elements of job satisfaction seem to indicate that the satisfied teacher feels independent, involved, influential and valued.

#### D. Teacher Attitude and Pupil Scores

##### 1. 6th Grade

For the total 6th grade sample there were no significant relationships between pupil and teacher pretest scores. There was one significant relationship among the Rokeach tests and the pupil posttests. The teachers' fall score on the Rokeach Dogmatism Scale correlated significantly with the pupils' spring score on the creativity test.

Neither the fall nor spring measures of traditionalism correlated significantly with any of the 6th grade pupil measures for the total group. However, in the experimental group a loss in traditional attitudes correlated significantly with a high pupil gain on the Self-Concept measure; while in the control group a gain in traditional attitudes correlated significantly with high pupil gain on the Self-Concept measure. This was considered a desirable finding since the study was attempting to reinforce the concept that nontraditional attitudes can be successfully employed in the teaching situation. The experimental teachers who exhibited a loss of traditional attitudes had pupils who gained in Self-Concept. Since this was not true in the control group, we can conclude that, in this respect, the experimental treatment did accomplish its purpose.

However, in the experimental group both a high posttest and a high gain in traditional attitude by teachers were associated with a high pupil posttest on Understanding Others. This reveals a basic conflict. If one leans toward traditional attitudes, Self-Concept is hindered but Understanding Others appears to be helped. If one leans away from traditional attitudes, Self-Concept is helped but Understanding Others is restricted. Investigation of possible strategies for increasing both attitudes is

Teacher attitude toward the open-democratic classroom correlated significantly with four pupil measures. A high teacher score in the fall was related to a low gain in pupil Self-Concept. However, a high teacher gain was associated with high gains in both Self-Concept and Understanding Others. The growth of teacher attitude toward the open-democratic classroom was associated with some very desirable pupil gains. In comparing the relationships of these two teacher attitude scores to these pupil variables, it appears that the open-democratic attitude is essentially a positive factor for both pupil Self-Concept and Understanding Others.

The negative association of the teacher ESA (open-democratic) pupil Self-Concept score supports the earlier finding in the Rokeach data that the teacher should begin the year with a very firm attitude. Further, the positive relationship with teacher gains in ESA scores suggests that as the year passes, the teacher should move toward an open attitude.

## 2. 5th Grade

For the total 5th grade sample there were four significant relationships between pupil and teacher pretests. All four correlations were with the ESB (closed-traditional) pretest. This may indicate that the traditional classroom has an early impact upon the pupils. On the other hand, it also could be a random factor due solely to chance.

There were two significant relationships among the Rokeach tests and the pupil posttests. The teachers' fall scores correlated significantly with the spring scores of the Language and Word Meaning scales of the Stanford Achievement Test. This may reflect a tendency of

the anti-dogmatic teacher to encourage verbal interaction resulting in superior language and vocabulary performance.

Teacher attitude toward the open-democratic classroom correlated significantly with two pupil measures. A high, positive teacher attitude toward the open-democratic classroom in the fall was associated with high pupil scores in Creative Attitude and Appreciation of Human Accomplishment in the spring. This result is perfectly in line with the theory underlying this study. It supports the position that the open-democratic classroom is beneficial to pupil creative attitude.

In addition to the teacher test data, the variables of teacher sex and teacher experience were found to relate to pupil variables. Female teachers are associated with pupil success in Arithmetic Concepts. More experienced teachers are associated with pupil success in all arithmetic scales and with a higher pupil creative attitude. It seems reasonable that more experienced teachers would be more effective arithmetic instructors. In light of these relationships, the previously cited staffing differences among buildings take on added impact.

#### E. Program

The in-service program was well received by the teachers. All but one of the teachers experimented with ideas or materials presented.

The effectiveness of the sessions appeared to be directly related to teacher acceptance of the speaker. In planning an in-service program, the most crucial element may be the choice of speakers. Ability to communicate with the specific audience is a more important criterion for speaker selection than knowledge of a topic.

The use of a newsletter was a successful addition to the program.

According to teacher comments, programs such as this one should be held early in the day, should be located in congenial quarters, and should emphasize small group interaction. Such programs should be scheduled for the early part of the school year so that there is time for the effects of the program to be seen.

F. Conclusions

6th Grade Pupils

(1) There were no significant differences between experimental and control groups in Creativity, Self-Concept or Understanding Others.

(2) Between schools and classes, however, there were significant differences in Creativity and Self-Concept.

5th Grade Pupils

(1) There were no significant differences between experimental and control groups in the eight achievement or nine attitude measures.

(2) Between schools, however, there were significant differences on 16 of the 19 measures on the pretest and 13 of 17 on the posttest.

(3) Pupil race related significantly to several posttest achievement scores.

Teachers

(1) There were no significant differences between experimental and control teachers on the attitudes measured in this study.

(2) Factors such as teacher residence, background and education, which are indicative of socioeconomic status, were significantly related to teachers' attitudes toward the classroom.

(3) Job satisfaction was significantly related to teacher classroom attitudes.

(4) Innovative classroom practices were negatively associated with attitudes favoring traditionalism.

(5) Teacher sex and experience were found to be related to several pupil variables. Both teacher sex and experience were unequally distributed

### Teacher to Pupil Data

(1) In the 6th grade, greatest pupil growth in Creativity, Self-Concept and Understanding Others occurred in classes where teachers demonstrated a closed-traditional attitude at the beginning of the year and developed a more open-democratic attitude during the school year.

(2) In the 5th grade, greatest pupil growth in Language and Word Meaning occurred in the classes where teachers demonstrated an anti-dogmatic attitude.

(3) In the 5th grade, greatest pupil growth in Creative Attitude and Appreciation of Human Accomplishment occurred in classes where teachers demonstrated a preference for the Open-Democratic Classroom.

### Program

Although the workshop programs were generally well received, the participants submitted many valuable suggestions for possible improvements in future in-service programs.