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DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Gene Edmund Stanley, B.A., M.A.

* * * * * * *

The Ohio State University
1969

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(1) the staff members of The Ohio State University and the administrative staff of the Kanawha County School System who presented a plan for a different kind of high school and
(2) the teaching staff of George Washington High School who took the plan and developed a successful educational program for young people.
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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>ii</td>
</tr>
<tr>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>I. NATURE OF THE STUDY</td>
<td>1</td>
</tr>
<tr>
<td>Need for Educational Change</td>
<td>1</td>
</tr>
<tr>
<td>Change through Inservice Education</td>
<td>4</td>
</tr>
<tr>
<td>Factors Related to Attitudinal Change</td>
<td>6</td>
</tr>
<tr>
<td>Attitudes and Measurement</td>
<td>10</td>
</tr>
<tr>
<td>Statement of Purpose</td>
<td>12</td>
</tr>
<tr>
<td>Hypotheses to be Tested</td>
<td>13</td>
</tr>
<tr>
<td>Some Basic Assumptions</td>
<td>14</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>16</td>
</tr>
<tr>
<td>Study Procedure</td>
<td>17</td>
</tr>
<tr>
<td>Limitations of Study</td>
<td>20</td>
</tr>
<tr>
<td>Methods of Obtaining Data</td>
<td>22</td>
</tr>
<tr>
<td>Instruments Used in the Study</td>
<td>23</td>
</tr>
<tr>
<td>Methods of Treating Data</td>
<td>24</td>
</tr>
<tr>
<td>Related Studies</td>
<td>25</td>
</tr>
<tr>
<td>Organization of the Study</td>
<td>27</td>
</tr>
<tr>
<td>II. DESIRABLE OBJECTIVES OF SECONDARY EDUCATION</td>
<td>29</td>
</tr>
<tr>
<td>Historical Perspective</td>
<td>29</td>
</tr>
<tr>
<td>The Education Decade: 1957-1967</td>
<td>36</td>
</tr>
<tr>
<td>George Washington High School Project</td>
<td>40</td>
</tr>
<tr>
<td>Objective of Self-Direction</td>
<td>43</td>
</tr>
<tr>
<td>Objective of Small-Group Interaction</td>
<td>45</td>
</tr>
<tr>
<td>Objective of Large-Group Instruction</td>
<td>47</td>
</tr>
<tr>
<td>Objective of Team Teaching</td>
<td>48</td>
</tr>
</tbody>
</table>
## Multiple Correlations of Independent Variables with the Dependent Variable

<table>
<thead>
<tr>
<th>Type of Correlation</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six-Predictor Multiple Correlation - Combination I</td>
<td>112</td>
</tr>
<tr>
<td>Two-Predictor Multiple Correlation - Combination II</td>
<td>114</td>
</tr>
<tr>
<td>Four-Predictor Multiple Correlation - Combination III</td>
<td>116</td>
</tr>
<tr>
<td>Two-Predictor Multiple Correlation - Combination IV</td>
<td>118</td>
</tr>
<tr>
<td>Two-Predictor Multiple Correlation - Combination V</td>
<td>120</td>
</tr>
<tr>
<td>Two-Predictor Multiple Correlation - Combination VI</td>
<td>122</td>
</tr>
</tbody>
</table>

## V. SUMMARY, CONCLUSIONS, AND IMPLICATIONS OF STUDY

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summary</td>
<td>126</td>
</tr>
<tr>
<td>Purpose and Nature of the Study</td>
<td>126</td>
</tr>
<tr>
<td>Summary of Findings</td>
<td>130</td>
</tr>
<tr>
<td>Conclusions</td>
<td>133</td>
</tr>
<tr>
<td>Implications</td>
<td>134</td>
</tr>
<tr>
<td>Implications for Education</td>
<td>134</td>
</tr>
<tr>
<td>Implications for Research</td>
<td>136</td>
</tr>
</tbody>
</table>

## APPENDIX

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIBLIOGRAPHY</td>
<td>151</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Procedural Flowchart of Inservice Program</td>
</tr>
<tr>
<td>2</td>
<td>Polar Terms Used in the Semantic Differential</td>
</tr>
<tr>
<td>3</td>
<td>Ranking of Participants as Related to the Dependent Variable: Post-test Less Pretest Directional Change</td>
</tr>
<tr>
<td>4</td>
<td>Chart of Independent Variables Ordered to Correspond with Attitude Change Scores</td>
</tr>
<tr>
<td>5</td>
<td>Summary Data of Split Halves Comparisons</td>
</tr>
<tr>
<td>6</td>
<td>Correlation of Each Independent Variable with the Dependent Variable</td>
</tr>
<tr>
<td>7</td>
<td>Six-Predictor Multiple Correlation - Combination I</td>
</tr>
<tr>
<td>8</td>
<td>Six-Predictor Multiple Correlation - Combination I: Analysis of Variance for the Regression</td>
</tr>
<tr>
<td>9</td>
<td>Two-Predictor Multiple Correlation - Combination II</td>
</tr>
<tr>
<td>10</td>
<td>Two-Predictor Multiple Correlation - Combination II: Analysis of Variance for the Regression</td>
</tr>
<tr>
<td>11</td>
<td>Four-Predictor Multiple Correlation - Combination III</td>
</tr>
</tbody>
</table>
CHAPTER I. NATURE OF THE STUDY

NEED FOR EDUCATIONAL CHANGE

The secondary schools of our nation historically have been characterized by change. Change in the existing purposes, functions and organization of these schools seems to be both desirable and inevitable. The Educational Policies Commission cited the concern a decade ago.

Assessment of American education is today a matter of great public concern. Debate on educational issues is not new in America. The current debate, however, is animated by a new spirit of urgency due to an unprecedented foreboding about the future and an unprecedented awareness of human potential for progress.¹

Major improvements in the quality of education can only be accomplished by making basic changes in present practices. The whole concept of the secondary school--its purposes, its methods, its staff, its curriculum and its facilities--must

undergo basic, carefully considered changes. Progress has resulted from experimentation and adaptation to new ideas. Continued changes are essential to ensure superiority in a competitive world.  

The following broad categories of change characterize the schools of tomorrow:

1. The schools will make major changes in the curriculum; these changes will be focused on achieving a greater continuum in learning and a substantial reorganization of both old and new knowledge.

2. These changes will give concurrent and coordinated emphasis to the content to be taught and learned, the resources for the teaching and the learning of this content, and the instructional methodologies employed by teachers.

3. Tomorrow's schools will increasingly honor individual differences among teachers as well as honoring such differences among learners. Opportunity for learners to assume greater responsibility for their own learning will be expanded.

4. Greatly increased flexibility will characterize the institutional arrangements, instructional groupings, and

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patterns of staffing and organization than is typically the case today.\textsuperscript{3}

Specific elements of change related to the broad categories above are described in Chapter II of this paper.

In moving from the older concepts of school curriculum and organization to the secondary school of tomorrow, the individual teacher must develop a new orientation. One writer, Kimball Young, has asserted that many teachers are authoritarian in nature, have predetermined attitudes, employ stereotyped and consequently maladaptive types of approaches to many problems.\textsuperscript{4} Authoritarian attitudes and reactions of teachers in the teaching situation are the antithesis of some of the newer concepts which schools will face in the future. Thus, a major task in the development of improved schools will be the re-education involved in curriculum development. George Sharp\textsuperscript{5} states that

\begin{flushleft}
\textsuperscript{3} Lester W. Nelson, "Some Administrative Imperatives for Tomorrow's Schools" Prepared speech presented to the West Virginia Association of School Administrators and the West Virginia School Board Association on March 29, 1962.


\end{flushleft}
curriculum develops basically as the result of the development of teachers' personalities.

CHANGE THROUGH INSERVICE EDUCATION

The reorientation of the traditional teacher can come about only through a slow process of re-education in which the teacher is helped to achieve new insights and new attitudes. As the process continues over a period of time, the teacher may gradually come to accept a new concept of the curriculum and gradually develop a new mode of teaching behavior. To achieve some deliberate changes it appears possible to communicate directly with individuals, as by talks, classes, workshops, or propaganda, or to manipulate the situation, the social group, group norms, and structure. Likert states that attitude change is constantly occurring as a result of learning and because of individual and situational influences.

Vernon C. Lindgren has stated that "In-service education is a logical necessary device for the new

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emerging curriculum." A workshop study completed in 1954 at The Ohio State University emphasized this need by asserting that "Inservice education is inseparable from curriculum development and changes in the concept of the curriculum must be accompanied by changes in the scope and forms of inservice programs." In the opinion of Henry Brickell, the best circumstances for re-education are the following:

...the teacher of teachers knows more about the innovation than those he is re-educating, and has himself succeeded in using the program with children. The instruction reaches simultaneously all teachers who should use the innovation, extends over a long period of time and is interspersed with actual classroom practice in using the innovation.

An important development of inservice education has been a tendency to evaluate the effects of inservice activities upon teachers and teacher attitudes.

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Emans found significant differences at the .01 level in mean scores of 118 teachers on attitude scales taken before and after the inservice education experience. \(^{10}\) Henderson evaluated the program of 26 workshops by securing pretest and final test results on an inventory of attitudes toward teaching, questionnaire replies, and letters of inquiry; changes in attitudes were significant at the .01 level. \(^{11}\)

**FACTORS RELATED TO ATTITUDDINAL CHANGE**

Evidence indicates that there are factors which may have important influences on the dynamics of attitudinal change. When instruction goes beyond intellectual assent, the attitudes which the individual brings to the situation influence the outcome. Kemp \(^{12}\) has found that the results of an inservice program vary greatly because of their relationship to the cognitive and emotional readiness of the

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\(^{10}\) Lester M. Emans, "Inservice Education of Teachers Through Cooperative Curriculum Study," *Journal of Educational Research*, 41 (September, 1948), 699.


individual in the training of school counselors. This finding focuses attention on the influence of sources of variation in the process of change.

Research studies indicate that the characteristic of openmindedness could be an important factor in the process of attitudinal change. Two of the personal characteristics identified through the use of the Dogmatism Scale would be highly desirable for individuals participating in an inservice program: (1) the relatively openminded person can better synthesize or integrate beliefs into a new system which contradicts his traditional experience and do it faster; and (2) the relatively openminded person appears to be more willing to play along and to entertain new belief systems.

The abilities measured in the Watson-Glaser Critical Thinking Appraisal may provide a source of variation in the change of attitudes. Some items in this instrument pertain to subject matter involving political, economic, social, and racial issues toward which people are apt to have emotional feelings, biases, or prejudices. Not all the items will have

the same emotional impact for each individual, but the inclusion of materials from various areas of common prejudice or controversy should generally provide a partial sample of an individual's thinking about issues regarding which he is apt to have personal biases. Thus, any testee's total critical thinking score is likely to be reduced by any lack of objectivity in his thinking about the problems posed. This lack of objectivity in the thinking process can be related to the individual's readiness for change in an inservice program.

Several divergent-thinking factors have been used in research regarding the dimensions of aptitude. Guilford has defined the factor of originality as the kind that goes off in different directions. It makes possible changes of direction in problem solving and also leads to a diversity of answers, where more than one answer may be acceptable. The factor of word fluency or the ability to produce words rapidly fulfilling specified symbolic requirements has been found related to creative performance of students of

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sciences and of arts in college. The factor of ideational fluency or the ability to call up many ideas in a situation relatively free from restrictions, where quality of response is unimportant, has been found to have interesting uses. These divergent-thinking factors could serve as sources of variation in the change of attitudes.

Sex of the participants can also be considered as a possible source of variation in the process of attitudinal change. In a study of the personality characteristics of college students, the females were found to be less stereotypic in their beliefs, better critical thinkers, more emergent-value oriented, and less dogmatic than their male counterparts.

Formal education and length of teaching experience are two other possible sources of variation which can be considered in the process of attitudinal change of teachers in an inservice program. A study conducted by Jones and Geier investigated whether

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teachers differ in some of their basic attitudes. In the comparison of the ten high-scoring teachers (high ethnocentrism and anti-democratic potential) with the ten lowest, the upper group was higher in church attendance, amount of elementary school experience, and in total years taught.\textsuperscript{18}

ATTITUDES AND MEASUREMENT

In terms of complexity and generality, attitudes seem to be an important aspect in the hierarchy of personality structure. Green\textsuperscript{19} distinguishes attitudes from other psychological variables in terms of the set of social objects that forms the reference class of an attitude. The content of an attitude is determined by the responses which comprise it; the set from which these are drawn is called the attitude universe.

Attitudes may be inferred from expressive or symbolic behavior in which overt choice is implied or indirectly expressed, as on questionnaires, in


interviews, and in responses to projective techniques or by observation of overt behavior related to but not identical to the choices in question.\textsuperscript{20} Getzels characterized a respondent's answers to a questionnaire as a suitable compromise between his actual opinion (which is not directly available for study) and his perception of the requirements of the immediate situation.\textsuperscript{21}

In conclusion, investigations carried on by researchers during the past decade indicate that the attitudes of teachers toward children and school activities can be measured with high reliability and that they are significantly correlated with other factors which serve as sources of variation. In this context attitude measurement is not an end in itself. Its purpose can provide information concerning personality and experiential factors which can assist social planners and controllers in understanding behavior dynamics.


STATEMENT OF PURPOSE

The purpose of this study was to determine the relative attitudinal change of participants following a planned inservice education experience and to relate these changes to the participant's scores on scales measuring critical thinking, openness to change, originality and ideational fluency and the factors of formal education, teaching experience and sex.

This purpose was accomplished following the solution of the problems listed below:

1. Determining the objectives for an inservice training program which was concerned with the following critical areas:
   a. Development of positive concepts related to self-direction on the part of students.
   b. Development of positive concepts related to small group processes.
   c. Development of positive concepts related to large group instruction.
   d. Development of positive concepts related to team teaching or cooperative teaching processes.
2. Determining directional change in the participants' attitudes toward the program objectives of the inservice education experience following the program.

3. Determining through an analysis of the data how the change of attitudes of participants is related to their individual critical thinking, openness to change, originality and ideational fluency scores and to the factors of formal education, teaching experience and sex.

HYPOTHESES TO BE TESTED

The study was based on nine hypotheses listed as follows:

1. The inservice education program will not result in a measureable shift of attitudes on the part of the participant in relation to the objectives of the inservice education experience.

2. The critical thinking ability of the participant is not related to measured change in participant attitudes.
3. The openness to change score of the participant is not related to measured change in participant attitudes.
4. The originality score of the participant is not related to measured change in participant attitudes.
5. The ideational fluency score of the participant is not related to measured change in participant attitudes.
6. The relative length of formal education of the participant is not related to measured change in participant attitudes.
7. The relative length of teaching experience of the participant is not related to measured change in participant attitudes.
8. The sex of the participant is not related to measured change in participant attitudes.
9. The six independent variables other than sex do not intercorrelate when related to measured change in participant attitudes.

SOME BASIC ASSUMPTIONS

Several basic assumptions underlying the frame of reference of this study are presented as follows:
1. Inservice education of teachers will continue to play an important role in the preparation for change in the instructional situation and its effectiveness should be evaluated.

2. The model developed in this study to determine the relatedness of critical thinking, openness to change, originality and ideational fluency, formal education, teaching experience and the sex of participants to their attitudinal change following an inservice education experience is an appropriate device for studying the impact of an inservice education experience.

3. Attitudes are stable and dependable personality characteristics of such consequence as to be included in this study.

4. A nine-month period is adequate for a measurable change in teacher attitudes regarding the teaching-learning process.

5. Attitudinal change in teachers will result in a behavioral change in the teaching-learning situation.
6. The validity, reliability, and objectivity of existing measurement instruments used in this study are acceptable.

7. Adequate instrumentation was developed to take measures of attitudes in a pretest and posttest situation.

8. The limited sample in this study was fairly representative of teachers interested in educational change.

DEFINITION OF TERMS

For purposes of this study the following definition of terms were used:

**Objective:** The established value which serves as an aim or goal and toward which effort is directed.

**Attitude:** A predisposition to react favorably, unfavorably, or apathetically toward a referent under certain conditions.

**Self-Direction:** The ability to set realistic objectives; the initiative to proceed as a result of one's own motivation; the acceptance of responsibility for the outcome of one's action; the interest, desire, and willingness to assist and cooperate with others; and the ability to use resources intelligently.
Small-Group Processes: The pattern of interaction within a group (12-15) as members strive to achieve common goals or solve common problems.

Large-Group Instruction: The methods and techniques used in attempting to teach a number of persons (60-300) the same thing at the same time.

Team Teaching Organization: The provision for flexibility in scheduling of staff to accommodate small-group interaction, large-group instruction and pupil-directed study; the provision for differentiation of teaching roles in accordance with special interests and abilities and the relieving of teachers from nonteaching duties; the provision for cooperative planning and execution by teachers; and the provision for an on-going inservice experience for new team members.

STUDY PROCEDURE

Data were obtained from an intensive study of a group of participants who had requested to be on the staff of an experimental school and had agreed to participate in an inservice program. The sample involved thirty (30) participants. The participants
in the inservice program were employed concurrently by the Kanawha County Schools, Charleston, West Virginia, and were readily available to the researcher throughout the experimental period.

The researcher outlined the objectives for the inservice program and structured the activities of the program. Teachers who wished to become a part of this inservice program and ultimately staff members of the experimental school understood their obligations related to the inservice program at the time when they volunteered for the program. Approximately nine (9) school days were given to the participants for the inservice program and approximately nine (9) days of their own time were contributed by the participants for this purpose.

Based on the inservice program objectives, evaluative devices were developed to measure attitudes of the participants. The One-Group Pretest-Posttest Design\(^2^2\) was used in the study of participant attitudes. A pretest of selected independent

variables was used; i.e., critical thinking, openness to change, originality and ideational fluency. Other independent variables were formal education, teaching experience and sex. This design permitted the researcher to look intensively at the participant and his attitudinal change in relation to several predictor or independent variables following the inservice education experience.

The One-Group Pretest-Posttest Design is used widely in educational research and was considered adequate for this study. According to Campbell and Stanley there are several different classes of extraneous variables relevant to the internal validity of an experimental design; these variables, if not controlled in the experimental design, might produce effects confounded with the effect of the experimental stimulus.\(^{23}\)

The design of this study is not troubled by either biases resulting in differential selection of respondents from comparison groups or experimental mortality, the differential loss of respondents from the comparison groups.

Since this design is used with mature and educated adults, the design concern of maturation

\(^{23}\)Ibid., p. 175.
is reduced. The design concern of history did not materialize as a problem between the pretest and the posttest. The effects of taking a test upon the scores of a second testing as a design concern were elevated by using an instrument found to be indirect and nonthreatening. (See Chapter IV). Instrumentation, in which changes in the calibration of a measuring instrument or changes in the observers or scorers may produce changes in the obtained measurements, was not a design concern for this study. Statistical regression, operating where groups have been selected on the basis of their extreme scores, did not have a role of significance in this study.

An important aspect of this project was the creation or development of an educational treatment (inservice experience). This treatment is outlined in detail in Chapter IV of this paper. The One-Group Pretest-Posttest Design provides a measurement based on this treatment. There is no attempt to compare possible treatments.

LIMITATIONS OF STUDY

The major limitations of this study were as follows:
The limitations of the sampling procedure: The sample was not randomly selected nor was a control group utilized. The assumption was made that the participants were representative of teachers interested in a program of educational change in the secondary schools.

The number of participants was small, but thirty participants was assumed to be adequate for a study of this type; obviously limited generalizations can be generated from a sample of this size.

The limitations of the instruments: Any measurement instrument in psychology and/or education has limitations. No attempt was made to measure all changes in the perceptions and practices of participants involved in this study. The instrument developed for the study and the selected instruments were considered the best for achieving the purpose of the study.

The limitations of the inservice training program: The time allocated for teacher released time during the program, available source materials and the relatively few speakers other than the program director were all restrictions on both the scope and the quality of the inservice experience.
The limitation of the dependent variable: The attitudinal change of subjects from pretest to post-test was the major variable on which the study rests. The assumption is that variables such as maturity levels and other personality factors remained constant.

METHODS OF OBTAINING DATA

In order to accomplish the purpose of this study, it was deemed necessary to involve all teachers selected one year in advance of the opening of an experimental high school in Charleston, West Virginia. Participants in this case were primarily teachers already in the employ of the Kanawha County Board of Education and teaching in secondary schools within the system. Two were experienced teachers who moved into the area, applied for positions in this school only, and did not teach in the district until the opening of George Washington High School in the fall of 1964.

The participants used in this study were those who properly completed the instruments administered at the beginning and at the end of the inservice program.

A mimeographed information questionnaire was distributed at the beginning of the program and provided all other personal data used in the study.
Both the personal data and the measurement information were submitted with a three-digit code selected by each participant as his individual reference. Thus, each participant retained a high degree of anonymity throughout the testing program.

INSTRUMENTS USED IN THE STUDY

The instruments used in the study were (1) a semantic differential,\(^{24}\) (2) the Watson-Glaser Critical Thinking Appraisal, (3) the Dogmatism Scale (Opinionnaire), and (4) Consequences.

The semantic differential was used to measure change in the connotative meanings of certain educational concepts. The educational concepts selected were derived from the theoretical framework developed in Chapter II. The semantic differential is discussed in detail in Chapter III. This instrument was the only instrument administered at both the beginning and at the end of the inservice program to participants.

Descriptions of each of the other measurement instruments with statements regarding validity and reliability are presented in Chapter IV.

\(^{24}\)A copy of this instrument is found in the Appendix of this study.
METHODS OF TREATING DATA

The dependent variable or criterion variable is attitudinal change. These data were secured from the pretest-posttest procedure; statistical comparisons of the data were made by means of Wilcoxon's matched-pairs signed ranks test.

The independent variables or predictor variables were grouped as follows:

- **Nominal**  Sex
- **Ordinal**  Formal Education  Teaching Experience  Critical Thinking  Openness to Change  Originality  Ideational Fluency

The phi correlation technique was used to provide data in terms of sex. The relationship of each of the other independent variables was correlated with the dependent variable. The strength of relationship between two or more of the variables was determined through the use of the multiple regression technique. For purposes of multiple correlation with the dependent variable, the following combinations of independent variables were used:
Combination I

Formal Education
Teaching Experience
Critical Thinking
Openness to Change
Originality
Ideational Fluency

Combination II

Formal Education
Teaching Experience

Combination III

Critical Thinking
Openness to Change
Originality
Ideational Fluency

Combination IV

Critical Thinking
Openness to Change

Combination V

Openness to Change
Originality

Combination VI

Critical Thinking
Ideational Fluency

The .05 level of confidence was used as the acceptable statistical significance.

RELATED STUDIES

Searches for studies which add an objective similar to the purpose of this study were only partially successful. Three sources were surveyed
in the search for related studies: (1) Psychological Abstracts, (2) Dissertation Abstracts and (3) Education Index.

Many articles and studies had interests in the same theoretical area but none had used the concept of attitudinal change as related to predictor variables.

Benson, in his study of changes in practices of workshop participants, explored an area which has some relevance to this investigation. He hypothesized that people who were more flexible in their concept of themselves and others would change more than people who were less flexible in their concept of themselves and others. The more flexible group changed their guidance programs more than the less flexible group.

Harry Engle investigated the relevance of the "openness" of teachers and administrators to the extent of change which occurred during a workshop. This investigator hypothesized that participants who were identified as "more open" to their experience would change more in educationally significant ways than participants who were identified as "less open" to their experience when provided an educational experience characterized by a learning climate conducive to positive change. This hypothesis was supported by the data.\textsuperscript{29}

**ORGANIZATION OF THE STUDY**

This chapter presented the general nature of the investigation. The purpose of the investigation was stated and the steps necessary for accomplishing the purpose of this study were outlined.

Background for the educational objectives of the study will be presented in Chapter II. This chapter will indicate the evolution of educational objectives in this nation with emphasis on the period 1957-1967. Chapter II will present selected operational goals

for secondary education that have special bearing on the hypotheses of the study.

Chapter III contains the rationale of the hypothesis relating to attitudinal change. This chapter will discuss the characteristics of attitudes and the relative ability of measurement instruments to measure attitudes. Emphasis will be placed on the use of the semantic differential in measuring attitudinal change.

On the basis of the rationale presented in Chapters II and III, an experimental test of the hypotheses was made. Chapter IV contains a discussion of the experimental design describing the background and purposes of the inservice program used as the vehicle for change, the planning for the experience, the organizational framework of the program, and special emphases on the instruments used for collecting data.

Chapter V contains an analysis of the data and presentation of findings with relevance to the hypotheses.

On the basis of the findings, Chapter VI presents conclusions, projected implications for education and recommendations for further study and research.
CHAPTER II. DESIRABLE OBJECTIVES OF SECONDARY EDUCATION

HISTORICAL PERSPECTIVE

Each period in American history has given new form to the aspirations that shaped the schools of that period. A brief review is made here of educational goals and practices of selected periods in the evolutionary development of American education.

In the Colonial period the educational goals were limited to a few narrow objectives for a small number of pupils.

The Revolutionary period was vibrant with the doctrine of the rights of man, with assertions of human freedom, with the need for a literate people, with a sense of the value of education for its effect in raising human worth, and with a growing concern for educating the masses. Education moved toward a curriculum where subjects of a scientific, commercial, and vocational nature were emphasized. The quest for facts was found on every hand and educational leaders demanded that youth in a democracy be trained in practical knowledges that would prepare them for life.
In 1821 the Boston School Committee established a school, the first high school, which was designed to provide more extensive training to qualify youth to fill both public and private positions as indicated by the needs of society. ¹ This school and others like it encouraged education for the masses and helped identify the need for due consideration for the individuality of students. The goal of these schools was to provide more extensive knowledge and train youth to fill more mercantile and mechanical positions.

By the latter part of the nineteenth century there were so many subjects in the high school curriculum that a "Committee of Ten," appointed by the National Education Association, was asked to study this curriculum problem. More than half of the ten members were professionally committed to higher education. They sought to unify the curriculum. The report of the committee in 1893 presented an organization of nine subject areas which would better prepare students for the duties of life. ² The primary basis of such a curriculum was found in the prevalent disciplinarian value rather than the social value of education and was not meant for all youth. The


goal of this program was largely that of preparing students for college. By standardizing the curriculum to assure adequate disciplining of the mind, students could meet the new college entrance requirements and thereby upgrade education. About this time, other people held views that had been influenced by the ideas of Rousseau, Pestalozzi, and Groebel. There was some evidence that educational interest was beginning to shift from systems and subjects to children and individual needs. This was most evident in the elementary and private schools.

With the beginning of the twentieth century, John Dewey was asking questions pertinent to the objectives of the schools and striving to find answers. He perceived the school as a place of living by doing rather than a place of preparation for life. This approach implied the need for critical thinking, for need identification, for self-directed activity, for cooperative action and for the use of intelligent problem-solving methods. To Dewey, the curriculum was not a set course of studies; it had to be continually redefined and re-evaluated.

3 Ibid., p. 231.
In 1918 the efforts of many reformers of education culminated in the establishment of the Progressive Education Association. Its central concepts were as follows:

(1) that respect for the personality of the child is of primary importance; (2) that the child and his needs and interests are more important than subject-matter; (3) that schools should concern themselves with developing the whole child, not with just some aspects of his nature; and (4) that good learning results not from external but from internal motivation.\(^5\)

The obvious concern for individual personality and its development was not limited to the work of Dewey.

The Commission on the Reorganization of Secondary Education (1912-1920), a commission of the National Education Association, presented the well-known "Cardinal Principles of Secondary Education." The goal of education was defined as "social efficiency" and the seven principles served as guides to determine the value of a given subject or activity. The principles were: (1) health, (2) command of fundamental processes, (3) worthy home membership, (4) worthy use of leisure time, (5) vocation, (6) citizenship, and (7) ethical character.\(^6\)

In 1938 the Educational Policies Commission presented a report on the purposes of Education in America.

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This report identified four broad but interrelated aspects of educational goals. The four groups identified were as follows: (1) the objectives of self-realization, (2) the objectives of human relationships, (3) the objectives of economic efficiency, and (4) the objectives of civic responsibility.7 The report was concerned primarily with the development of the learner.

The first role, or phase of total behavior, is that of the educated person. Conduct in this field is centered on the personal development, growth, and learning of the individual. It includes his use of the fundamental tools of learning, his health, his recreation, his personal philosophy. The placing of these objectives first in the list is not accidental. They deal with the development of the individual himself. In a democracy this field is of supreme importance. Success in this role conditions one's success in every other phase of life's activities.8

The Eight-Year Study was designed to test the hypothesis that high schools could drastically change their curriculum and still effectively prepare students for college. Almost all of the thirty schools selected in the experiment were committed to a philosophy of education based on cooperative teacher-student planning. At the close of the study (1942), the staff reported that while in college the experimental group:

(1) earned a higher total grade average, (2) received

8 Ibid., p. 45.
more academic honors, (3) had a higher degree of intellectual curiosity and drive, (4) was judged more systematic and objective in their thinking, (5) demonstrated more resourcefulness in new situations, and (6) demonstrated more active concern for world affairs.\(^{9}\)

Since their aims included the development of such behavior characteristics as openmindedness, creativeness, and imagination, the power and habit of analysis, the habit of reaching conclusions on the basis of valid evidence, and social concern and acceptance of responsibility, classroom procedures were initiated which were regarded as most likely to lead to these goals. Teacher-student planning, cooperative group work and evaluation, individual and small group problems and projects were the logical tools to use to develop these characteristics.\(^{10}\)

More recent developments in anthropology, sociology, psychology, and child growth and development have contributed much to philosophical beliefs that education exists to help people achieve the highest destiny of which they are capable. Goals of education are more concerned with the development of more adequate personality characteristics.

The ideal of modern education is not the development of the mind alone, but the creation of positive attitudes toward society and toward life. The idea, in full, is to enhance man's opportunity to be self-


directing. Man's total personality is to be educated, not only his intelligence. According to Rogers:

The goal of democratic education is to assist students to become individuals who are able to take self-initiated action and to be responsible for those actions; who are capable of intelligent choice of self-direction; who are critical learners, able to evaluate the contributions made by others; who have acquired knowledge relevant to the solution of problems; who, even more importantly, are able to adapt flexibly and intelligently to new problem situations; who have internalized an adaptive mode of approach to problems, utilizing all pertinent experience freely and creatively; who are able to cooperate effectively with others in the various activities; who work, not for the approval of others, but in terms of their own socialized purposes.

The primary goal of schools in a dynamic society is to create optimum conditions for individual growth and achievement of adequacy. People who are challenged, rather than threatened, by new problems are more likely to view with an open mind the possible solutions to them and to make better decisions related to the course of action chosen. These are the creative people with imagination, ideas, insights, and positive attitudes. The problem of education and of life itself is one of continuous re-adaptation. Without this flexibility, some schools will continue to appear to be a reflection of a society that has been left behind.

Education must develop "open" people who can more adequately meet the challenge of the explosion of knowledge in a dynamic society. Learning experiences provided by the school should be in the nature of functional enterprises which call for the exercise of maximum self-direction, assumption of responsibility, creative thinking, cooperative planning, and the use of the method of intelligence in solving real problems.

These goals are concerned with releasing the unique capacities of people so that each may contribute to the well-being of others and to the relative satisfaction of personal needs for the maintenance and enhancement of self.

THE EDUCATION DECADE: 1957-1967

John I. Goodlad\(^{12}\) states that the years from 1957 to 1967 constituted the Education Decade for the United States. It began with Sputnik and the challenge to education to win the cold war; it ended with a hot war and the growing realization that education is a long-term answer to mankind's problems and must not be confused with short-term social engineering.

During this decade the school years were extended both upward and downward with the school curriculum being revised from top to bottom; the Elementary and

Secondary Education Act of 1965 brought the federal government into the educational scene as never before; the schools became a focal point for social protest and a vehicle for social reform; the educational process joined politics and world affairs as leading topics of social discourse. "Innovation" and "revolution" were often used interchangeably in discussing the changes taking place in the schools.

This author contends that at the end of this decade the education scene remains confusing. On one hand the schools appear to be moving posthaste toward becoming centers of intense, exciting learning, marked by concern for the individual. On the other hand, the schools appear to be mired in tradition, insensitive to pressing social problems, and inadequate to the demands of learning.13

A checklist of expectations based on the most frequently discussed and recommended educational practices of the Education Decade are listed below:

1. Teaching would be characterized by efforts to determine where the student is at the outset of instruction, to diagnose his attainments and problems, and to base subsequent instruction on the results of this diagnosis.

2. Learning would be directed toward "learning how to learn," toward self-sustaining

13Ibid.
inquiry rather than the memorization and regurgitation of facts.

3. This inquiry would carry the student out of confining classrooms and into direct observation of physical and human phenomena.

4. Classrooms would be characterized by a wide variety of learning materials--records, tapes, models, programmed materials, film strips, pamphlets, and television--and would not be dominated by textbooks.

5. Attention to and concern for the individual and individual differences would show through clearly in assignments, class discussions, use of materials, grouping practices, and evaluation.

6. Teachers would understand and use such learning principles as reinforcement, motivation, and transfer of training.

7. Visitors would see vigorous, often heated, small and large group discussions, with the teacher in the background rather than the forefront.

8. One would find rather flexible school environments--marked by little attention to grade levels--and extensive use of team-teaching activities involving groups of teachers, older pupils, parents, and other persons in the teaching-learning process. And, certainly, it would be reasonable to expect to find innovative ways of dealing with special educational problems such as those presented by environmentally handicapped children.\(^\text{14}\)

Goodlad concludes that from his observation much of the so-called educational reform movement has been blunted on the classroom door. The incidences of drop-outs, nonpromotion, alienation and minimal learning

\(^{14}\text{Ibid.}, \text{p. 60.}\)
reinforce his apprehension that schools have become or are fast becoming obsolete for this period. They appear to have been designed for a different culture, a different conception of learning and teaching and a different clientele than exist in our society today.\textsuperscript{15}

He finds prevalent the strange notions that learning proceeds best in groups of thirty, that teachers are not to converse with each other, and that learning should be conducted under rather uncomfortable and restrictive circumstances.\textsuperscript{16}

Important to this study is his finding that comprehensive experiments in schooling are the rarest of all educational phenomena. Teachers have not seen in operation those procedures described in the listing of expectations. If teachers are to change, they must see models of what they are to change to; they must practice under guidance the new behaviors called for in exemplary models; and if teachers are to change, the occupation itself must have built into it the necessary provisions for self-renewal.\textsuperscript{17}

\textsuperscript{15}Ibid.
\textsuperscript{16}Ibid., p. 61.
\textsuperscript{17}Ibid.
GEORGE WASHINGTON HIGH SCHOOL PROJECT

The administrators and the Board of Education of Kanawha County, West Virginia, decided in 1960 that one of the new senior high schools being planned at that time should represent more than the usual piecemeal improvement over present schools. The desire was to take a bold step forward with an entirely new program for this one school. With such an opportunity available, there was little difficulty in persuading West Virginia State Department of Education officials, personnel from various divisions of the Bureau of Educational Research and Service, and faculty members of the College of Education at The Ohio State University, to join forces with the Kanawha County Staff in this project.

The purpose of the project was to formulate a new and different secondary school program which embodied the best thinking of educators and to implement this program in a new structure imaginatively created by a team of architects and educators.

The prime objective of the organization and program of the school was determined to be that of enabling pupils to become self-directed learners; pupils would be provided with the tools and skills needed to direct their own continuing education and be motivated to do so.
Features of the program included the following:

1. A curriculum organized into six major areas of learning rather than the usual individual subject fields: Arts of Language; Mathematics, Science, and Technology; Social Concepts; Health and Physical Education; Fine Arts and Humanities; and Education for Productive Citizenship. Each of the six learning areas would provide both general education for all and specialized opportunities for those having high levels of interest or ability. Each area would be emphasized for a period of time during the year.

2. A portion of each day was to be devoted to student self-directed learning activities. Guidance and planning activities were provided to assist students in developing this ability.

3. Teachers were organized into functional teams relating both to teacher-directed and to student-directed learning activities.

4. Various size groups were utilized for formal instructional purposes.

5. New media and instructional materials, particularly television and automated programed learning materials, were utilized in the instructional program of the school.

6. Scheduling was accomplished through the use of computers. Small modules of time were used to make possible varying periods of time to best fit the needs of large group, small group, and individual study needs.

7. Lay persons and other community resources were used in the instructional program.

8. The plant housing the program was designed to match the educational specifications involved.
9. The school was a pilot school for the county and the state and had implications for the nation.18

The over-all program organization and objectives of the school were translated into a practical program as budget permitted for teachers and administrators. In addition, the objectives for pupils were stated in behavioral terms as described by Will French in the Russell Sage Foundation study of behavioral goals19 which gives directions of growth for pupils involved in achieving maturity.

In discussing the broad behavioral goals of this project, an outline will be presented with major headings. A more specific outline will be presented under the topics relating to self-direction, small group interaction and large group instruction.

To be willing and able to manifest mature behaviors as an older youth, each high school pupil must be:


1. Attaining maximum intellectual growth and development; behavioral outcomes to be sought from general education since the living of a satisfying personal life requires intellectual growth and development toward the limit of one's capacity.

2. Becoming culturally oriented and integrated; behavioral outcomes sought from general education since the achievement of effective and desirable standards of behavior is largely dependent upon the cultural orientation and integration which enables one to participate understandably in social, cultural, ethical and esthetic experiences.

3. Maintaining and improving physical and mental health; behavioral outcomes to be sought from general education since the desirability of maintaining personal mental and physical health and of developing a healthful and safe environment.

4. Becoming economically competent; behavioral outcomes to be sought from general education because of the desirability of becoming economically literate and self-supporting; of making a wise choice of life work, of beginning basic common preparation for it, and of fulfilling the citizen's responsibility for safeguarding our natural and human resources.  

OBJECTIVE OF SELF-DIRECTION

Mature behaviors in older youth manifest growth toward self-realization and/or self-direction; general education in high school should help youth develop the common kinds of behaviors indicative of such personal growth and development as will enable them within the limits of their native endowments, to live richer, more

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20Ibid., p. 88.
satisfying, more productive lives consonant with our ethical, aesthetic, and social standards and values.

Specific behavior goals under this category are as follows:

1. Improving his study habits, study skills, and other work habits
   a. Is skillful in securing information and in organizing, evaluating, and reporting results of study and research
   b. Displays an inquiring mind; is intellectually curious and industrious
   c. Can learn independently and shows desire to do so
   d. Recognizes the importance of continuing to learn

2. Improving in his ability to communicate ideas and to recognize and use good standards
   a. Commands and uses the basic skills of reading for information, ideas, opinions, stimulation and leisure
   b. Expresses his ideas in speech, writing, or in some artistic form with increasing clarity and correctness
   c. Demonstrates his command of quantitative thinking
   d. Is developing some artistic and literary tastes and standards; exhibits creative capacity in some form of worthwhile intellectual activities

3. Becoming sensitive to, and competent in, the use of logical thinking and problem-solving processes
   a. Tends to make an objective approach to a problem and attempts to define it clearly
   b. Seeks pertinent information and organizes and evaluates data
c. Recognizes logical and illogical thinking in his efforts to reach reasonable conclusions\textsuperscript{21}

The above behavioral objectives for pupils are those which apply most directly to the concept of self-direction as relates to the George Washington High School project.

\textbf{OBJECTIVE OF SMALL GROUP INTERACTION}

Growth of pupils toward desirable interpersonal relations in small (face-to-face) groups; general education in high school should help youth develop the common kinds of behaviors needed by them in maintaining mutually helpful and stimulating face-to-face relationships with family members, school friends, and members of community groups, and in developing the interpersonal attitudes, habits and skills fundamental to the exercise of responsible citizenship.

More specific behavior goals under this category are listed as follows:

1. Sustaining friendly contacts with one's friends and with others in small unorganized groups
   a. Has friendly attitudes toward others and ability to accept them as individuals
   b. Is developing character qualities and command of social courtesies and skills needed in interpersonal relationships
   c. Improving in his ability to communicate in conversation with another

\textsuperscript{21}\textit{Ibid.}, pp. 92-101.
2. Developing behaviors indicative of the kinds of competence needed as a member of small organized groups

   a. Joins organized groups when their purposes relate to his tastes and interests, and develops the personal characteristics which contribute to successful small group membership
   b. Helps to plan group activities and does his share in carrying out plans
   c. Works well with others while maintaining his own views, ideas, and standards
   d. Uses democratic values and practices in organized group activities and in relations with fellow members

3. Utilizing various kinds of competence needed by members of small organized groups

   a. Uses organized group activities as a means of developing artistic, creative, social and political interests and abilities
   b. Is especially careful to apply the principle of full respect for personality toward small community subgroups when they represent cultural, racial, and religious interests different from his own
   c. Is actively interested in the problems faced by the school and community, and works in appropriate ways as a member of the student body and of community groups

The above behavioral objectives for pupils are those which apply most directly to the concept of small-group interaction as relates to the George Washington High School project.

22Ibid., pp. 137-153.
OBJECTIVE OF LARGE GROUP INSTRUCTION

Growth of pupils toward effective membership in large groups; general education in high school should help youth develop the common kinds of skills needed for efficient and effective participation in large groups.

Specific behavior goals under this category are as follows:

1. Improving his listening skills and his note-taking skills
   a. Recognizes the importance of attentive listening
   b. Is skillful in organizing information through discrimination as to major items vs. sub-items

2. Becoming sensitive to and using good standards of conduct
   a. Is aware of standards of conduct necessary for the efficient use of large group participation
   b. Demonstrates his ability to act in accordance with those standards

3. Using information derived in large group instruction as a stimulus to further learning
   a. Recognizes the efficiency of large group demonstration and instruction
   b. Demonstrates ability to use information and ideas received in large groups as a spring board for further learning
   c. Recognizes need to communicate reactions to information received to teachers and fellow pupils in small-groups
d. Strives to make a contribution to the large-group on bases of independent study or discussion coming from large-group activities

The above behavioral objectives for pupils are those which apply most directly to the concept of large-group instruction as relates to the George Washington High School project.

OBJECTIVE OF TEAM TEACHING ORGANIZATION

This objective differs from the previous three listed in that specific behavioral objectives for pupils are not applicable; behavioral objectives for teachers are applicable. This is not to say that specific behavioral objectives for teachers are not important regarding the objectives of Self-Direction, Small-Group Interaction and Large-Group Instruction; however, the objectives as stated are desirable ends and the relationship of teachers to these ends is a concern about means. These means will be briefly reviewed in the following subsection of this chapter.

Specific goals relating to teachers are listed under this category as follows:

1. Increasing cooperative teacher planning and sharing of ideas concerning the instructional program and pupil progress
2. Increasing use of unique individual teacher talents, interests, areas of knowledge and techniques of instruction

3. Releasing teachers from routine clerical and housekeeping chores through use of non-certificated clerks, aides and technicians

4. Sustaining staff development for teachers and non-certificated interns through team activities

5. Increasing the crossing of grade level lines, classroom lines and subject area lines through team activities

6. Differentiating teacher roles and responsibilities in terms of staff organization to use individual leadership potential

ORGANIZATIONAL RELATIONSHIPS OF SELECTED GOALS

There are certain administrative features which must be considered as highly desirable if not necessary to the achievement of the objectives outlined above. These features were projected in the blueprint for George Washington High School, Toward Self-Direction, and verified through the first two years of the school's operation.

Teachers should be organized into functional teams for teacher-directed and student-directed learning activities. A lead teacher and specialized teachers should be assigned to each instructional area. Each team should be implemented by part-time teachers, interns

from nearby teacher-training institutions, teacher aides, clerical workers and when appropriate, community people. This plan permits better utilization and assignment of the staff in accordance with special interests and abilities of staff members and relieves teachers of non-teaching duties.\textsuperscript{24}

Various size groups should be utilized for formal instruction. It is hypothesized that television teaching, film showing and lecturing can be as effective with a group of two hundred or three hundred as with a group of thirty. Group processes and social interaction can be most effectively experienced and assimilated in a small group. Reaction to programed learning material or to a live teacher in a tutorial situation is an individual matter. The use of varying size groups at once utilizes the teaching staff more efficiently, provides for better adaptation of instruction to individual differences and permits better programing of material as a function of the learning of individual pupils.\textsuperscript{25}

Special competencies of team members should be used in large-group presentations, small-group discussion, and in individual counseling and tutoring. Teacher

\textsuperscript{24}Ibid., pp. 22-23.
\textsuperscript{25}Ibid., p. 23.
interns should work under the supervision of fully qualified team members principally as discussion leaders of small groups, as consultants and aides to individual pupils, and in the preparation of instructional materials. Clerical personnel should keep records, make schedules, score test papers, and assist in the preparation of teaching materials.26

Time allocations should be made through use of fifteen or twenty minute modules. The small module of time will provide the flexibility of scheduling needed for the school. Thus, varying combinations of modules can be made to fit the varying size of groups and the varying activities of groups.27

Scheduling must be accomplished through the use of computers. Pupils should be scheduled into large groups, small groups, laboratory groups and into independent study according to desired sequences as specified by the teaching teams.28

The school plant housing this program must be designed to match the educational specifications involved. The nature of the program calls for many

26Ibid.
27Ibid.
28Ibid.
architectural innovations not typically found in today's secondary school: structural flexibility, a library that functions as an instructional-materials center, individual cubicles for independent pupil work, built-in electronic devices, academic and non-academic laboratories, large-group instructional facilities and multiple small-group interaction areas.\textsuperscript{29}

DESIRED CHANGES IN TEACHERS

Two major administrative concerns remain in the development of the George Washington High School project: (1) selection of qualified and interested staff; and (2) the staff development program to assist teachers in translating objectives into program.

The process of teacher selection is briefly reviewed in the fourth chapter.

Educating a teacher to think along the lines developed in this chapter and to give his wholehearted support to this program is a time-consuming project. Finally, lengthy planning is necessary after objectives have been accepted to allow time for team members to establish the rapport which will permit them to express their ideas without hesitation or fear of rejection.

\textsuperscript{29}Ibid., p. 25.
Only by actually planning together do they become aware of the almost limitless possibilities of such an approach.

Two writers, Heller and Belford, who have participated in the installation of this type of program reiterate the need for a carefully developed inservice program:

The importance of a well-planned orientation program cannot be over-emphasized. The feeling of confidence instilled in the teachers by extensive planning before the beginning of the school year insures a greater degree of smoothness of operation once the plans are put into action with the pupils. The confidence of the teaching staff, imparted to the pupils, is reflected in their rapid adjustment and increased effectiveness. Likewise, if a major portion of the curriculum planning has been done in advance, more time can be devoted to analyzing the degree of success or failure of the plans and revising them for better results.30

CHAPTER III. ATTITUDES AND ATTITUDBINAL MEASUREMENT

DEFINITION OF ATTITUDE

Many definitions of "attitude" exist in contemporary social science; one of which is presented in the definition of terms subsection of Chapter I. Some consensus and agreement is evident, particularly with respect to the major properties that attitudes are assumed to possess. Authorities tend to agree that attitudes are learned and implicit; they are inferred states of the organism that are presumably acquired in much the same manner that other similar internal learned activity is acquired. Attitudes are predispositions to respond, but are distinguished from other similar states of readiness in that they predispose toward an evaluative response. For this reason, attitudes are referred to as "tendencies of approach or avoidance" or as "favorable or unfavorable," etc. This characteristic is related to another shared view—that attitudes can be ascribed to some basic bipolar continuum with a neutral or zero reference point, implying that they
have both direction and intensity and thereby providing a basis for the quantitative indexing of attitudes.¹

The characterization of attitude as a learned implicit process which is potentially bipolar, varies in its intensity, and mediates evaluative behavior, suggests that attitude is part, and to some authorities, a major part of the internal mediational activity that operates between most stimulus and response patterns. The identification of attitude with anticipatory mediating activity has been made explicit by Doob, who, casting attitude within the framework of Hullian behavior theory, identified it with the "pure stimulus act" as a mediating mechanism.²

It appears that there is still lacking an identification and localization of attitude per se within this general system of mediational activity. Osgood and his associates state that their findings in semantic measurement suggest such an identification: If attitude is, indeed, some portion of the internal mediational activity, it is, by inference from the Osgood theoretical model, part of the semantic structure of an individual, and may be correspondingly indexed.³

² Ibid.
³ Ibid.
In terms of the operations of measurement with the semantic differential, Osgood, et.al., have defined the meaning of a concept as its allocation to a point in the multidimensional semantic space. They then define attitude toward a concept as the projection of this point onto the evaluative dimension of that space. Every point in semantic space has an evaluative component (even though the component may be of zero magnitude, when the evaluative judgments are neutral), and therefore, every concept must involve an attitudinal component as part of its total meaning.\(^4\)

Thus, "attitude" is identified as one of the major dimensions of meaning-in-general and the measurement procedures of the semantic differential can be extended to serve this area of social psychology.

CONSTRUCTION OF SEMANTIC DIFFERENTIALS

Among the constants in the work of Osgood and his associates have been the use of seven-step scales having a bipolar (verbal opposites) form and defined by adjectives. The authors have fairly satisfying evidence that these seven-step scales, defined by the linguistic quantifiers "extremely," "quite," and "slightly," in both directions from a neutral "meaningless" origin,
do yield nearly equal psychological units in the process of judgment.  

The more or less implicit assumption that thinking in terms of opposites is natural to the human species is important here; ethnolinguists usually agree that semantic opposition is common to most, if not all, language systems. A difficult methodological problem of the semantic differential is to demonstrate that the polar terms used are true psychological opposites, i.e., fall at equal distances from the origin of the semantic space and in opposite directions along a single straight line passing through the origin.

The authors assume that it is the lexical (root) meanings of the polar terms that determine judgments. Adjectives are used since they are the most general and natural qualifiers in English.

**RELIABILITY OF THE DIFFERENTIAL**

Test-retest reliability data have been obtained by Tannenbaum. Each of six concepts (LABOR LEADERS, THE CHICAGO TRIBUNE, SENATOR ROBERT TAFT, LEGALIZED GAMBLING, ABSTRACT ART, AND ACCELERATED COLLEGE

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PROGRAMS) was judged against six evaluative scales (good/bad, fair/unfair, valuable/worthless, tasty/dis­tasteful, clean/dirty, and pleasant/unpleasant) by 135 subjects on two occasions separated by five weeks. Attitude scores were computed by summing over the six scales after realignment according to a constant eval­uation direction. The test-retest coefficients ranged from .87 to .93, with a mean r (computed by z transform­ation) of .91. Additional reliability data con­firming Tannenbaum's findings was found in a validity study comparing findings from the Thurstone scales to the findings from semantic differential scales in a test-retest situation. This information is presented in the following subsection of this chapter.

VALIDITY OF THE DIFFERENTIAL

The evaluative dimension of the semantic differ­ential displays reasonable face-validity as a measure of attitude.\(^8\) For example, Suci was able to differen­tiate between high and low ethnocentrics, as determined independently from the E-scale of the Authoritarian Personality studies, on the basis of their ratings of various ethnic concepts on the evaluative scales of the differential. Similarly, evaluative scale ratings were

\(^8\) Ibid., pp. 192-193.
found to discriminate in expected ways between shades of political preference by Suci in his study of voting behavior\textsuperscript{9} and by Tannenbaum and Kerrick in their pictorial political symbolism study.\textsuperscript{10}

In the case of attitude there are other, independently devised measuring instruments which have been used and against which the technique can be evaluated.

One comparison is made with the Thurstone scales. Each of three concepts (THE NEGRO, THE CHURCH, AND CAPITAL PUNISHMENT) was rated against a series of scales, including five purely evaluative ones (fair/unfair, valuable/worthless, pleasant/unpleasant, clean/dirty, and good/bad). Subjects also indicated their attitudes on Thurstone scales specifically designed to scale these attitude objects—the standard scale for the Church, Form B of the Negro scale, and Form A of the Capital Punishment scale. Subjects were divided into two groups for testing purposes: one group (N=23) was given the semantic differential form first, followed approximately one hour later by the Thurstone tests, and the other group (N=27) had the reverse

\textsuperscript{9} Ibid., pp. 104-124.
\textsuperscript{10} Ibid., pp. 296-299.
order. Two weeks after the initial session, the subjects again took both tests, except that this time their respective orders were reversed.

The latter session was run to obtain reliability information on both types of attitude measuring instruments. The reliabilities of the two instruments are both high and equivalent. The correlation between the semantic differential scores and the corresponding Thurstone scores is significantly greater than chance \( p < .01 \) in each case, and in no case is the across-techniques correlation significantly lower than the reliability coefficient for the Thurstone test. The differences in the between-techniques correlations from first to second testing sessions are well within chance limits. It is apparent, then, that whatever the Thurstone scales measure, the evaluative factor of the semantic differential measures just about as well. When the six validity coefficients are corrected for attenuation, each is raised to the order of .90 or better.\(^{11}\)

Another comparison is made with a Guttman scale. An opportunity to test the validity of the evaluative factor of the differential as a measure of attitude

\(^{11}\)Ibid., pp. 193-194.
arose. A 14-item Guttman-type scale (reproducibility coefficient: .92) had been developed, at the expense of some time and labor, to assess the attitudes of farmers toward the agricultural practice of crop rotation. At approximately the same time, the semantic differential was being used in connection with a series of television programs dealing with agricultural practices, and one of the concepts included was CROP ROTATION. Although these studies were conducted independently, 28 subjects were found who had been exposed to both testing instruments. The Guttman scale had been administered first in all cases and the time between the two tests varied considerably, from only three days to almost four weeks.

With attitude scores on the differential obtained by summing over the three evaluative scales used (good/bad, fair/unfair, and valuable/worthless), the rank order correlation between the two instruments was highly significant (rho = .78; p < .01). Again it is evident that the Guttman scale and the evaluative scales of the differential are measuring the same thing to a considerable degree.12

12Ibid., pp. 194-195.
The findings of both of these studies support the notion that the evaluative factor of the semantic differential is an index of attitude. Although it does not tap much of the content of an attitude in the denotive sense (e.g., the specific reactions which people having various attitudes might make, the specific statements that they might accept), it does seem to provide an index to the location of the attitude object along a general evaluative continuum. That the semantic differential in toto may provide a richer picture of the meaning of the attitude object than just the evaluative dimension is a point illustrated as follows.

A recent pilot study by Trannenbaum demonstrates how increasing the dimensionality of judgment utilized within the differential can increase predictability.13 This does not involve direct, overt behavior toward the objects of attitude, but it does approach closer to that real-life situation. Subjects (N=40) were asked to judge three nationality concepts (GERMANS, CHINESE, AND HINDUS) against a series of semantic differential scales representative of the three major factors of meaning repeatedly obtained in factor analysis. In

13Ibid., p. 199.
addition, these subjects also rated each of the nationalities on a modified Bogardus Social Distance Scale. Separate factor scores were computed for each subject on each concept, and correlation coefficients were then computed both between these scores (e.g., evaluation/potency, potency/activity, etc.) and between them and the Bogardus ratings. While the evaluative factor correlated most highly with the Bogardus ratings, as might be expected, multiple correlation analysis showed that the predictability of the social distance ratings was significantly enhanced by addition of information from the other factors. On the concept GERMANS, for example, evaluative scores correlated only .22 with the Bogardus scale, yet combining all three yielded a multiple correlation of .78. The increases in predictability for the other two concepts were not so great but support the same conclusion.

THE SEMANTIC DIFFERENTIAL AS A MEASURE OF ATTITUDINAL CHANGE

The semantic differential technique has received recognition as a measure of change in attitudes. By assigning ratings on a number of concepts significant to the subject, the subject gives clues as to his attitudes, feelings and in more general terms, to his personality dynamics. Test-retest measures of the
subject's ratings lend themselves to interpretations regarding changes that may have occurred in the individual over-time or as a result of a controlled experience. For example, Endler used the semantic differential to measure changes during psychotherapy. Earlier, Osgood and Luria had conducted the pioneer study in this area with their analysis of the now-popular "Three Faces of Eve".

The semantic differential was used in a study by Webb and Harris as one means of evaluating a six-weeks NDEA Counselor Training Institute. The study was an attempt to apply a specific measurement technique to the assessment of possible changes which may have occurred in trainee points of view as a result of the institute. This study used the pretest-posttest procedure; changes in semantic profiles were assessed by means of the generalized distance formula suggested by Osgood which does not reflect directional change;


and statistical comparisons of the data were made by means of Wilcoxon's Paired Replicates Test. Not only was significant change found through the use of the semantic differential, but the data revealed significant sex differences. These sex differences were found in a relatively small sample of 26 male and 10 female enrollees in the institute.

The authors were gratified by the results obtained through the semantic differential in the study. It appeared that the instrument measured at least semantic changes that had occurred in the trainees during the six week institute.\footnote{Ibid., p. 263.}
CHAPTER XV. THE NATURE OF THE EXPERIMENT

The experimental design of this study is presented in the six sections of this chapter. The first section describes the 30 people who served as subjects. The second section describes the educational experience with which the subjects were provided. Testing procedures are outlined in the third section. The fourth and fifth sections deal with variables measured, the dependent variable and the independent or predictor variables, respectively. The treatment of data is presented in the final section.

A DESCRIPTION OF THE SUBJECTS

The secondary school teachers of the Kanawha County Schools, Charleston, West Virginia, were presented with the opportunity to volunteer for the new George Washington High School one year in advance of opening. Approximately 45 teachers applied and were subsequently interviewed by the principal elect. Thirty teachers were selected by October 15, 1963.

The practical consideration of subject-matter specialty tended to play a major role in reducing the
number selected from the original applicants; e.g., there were no applicants in several subject areas in contrast to the many applicants for guidance positions.

The teachers were aware of their obligation to participate in a nine-month inservice prior to the opening of the school. Most could be characterized as being interested in instructional improvement and were generally agreeable to "going along with" the plans of the George Washington Project Committee; however, the teachers had but a vague understanding of these plans.

The participants in the inservice program were employed concurrently by the Kanawha County School Board and were teaching full time in other schools throughout the academic year. Two were experienced teachers who moved into the area, applied for positions in the school, and did not teach in the district until the opening of George Washington High School in the fall of 1964.

A personal-information questionnaire was distributed at the beginning of the program and provided all personal data used in this study. Both the personal data and measurement data were submitted with a
three-digit code selected by each participant as his individual reference.

Of the 30 subjects, twenty were female and ten were male.

The subjects had a background of formal education ranging from two to six years with 21 having five years or more of academic work. Of the 30 subjects, eight had received a Bachelor's degree only; seventeen had either received a Master's degree or the equivalent in graduate hours; four had earned the equivalent of one year of work beyond the Master's degree; and the technical electronics teacher had completed two years of formal education.

The group ranged from two teachers having no teaching experience at the initial testing to one having twenty-nine years of experience. There was a mean teaching experience level of nine years.

THE EDUCATIONAL EXPERIENCE

The organizational framework of the inservice program was developed to present the concepts advocated in the blueprint for the high school, Toward Self-Direction,¹ which were briefly reviewed in Chapter II of this study.

¹ Conrad and Pauley, Toward Self-Direction.
Necessary objectives of this staff development program were as follows:

1. Assist participants in understanding the educational theory relating to program objectives.

2. Develop participant commitment for these objectives.

3. Translate objectives into specific instructional applications at the senior high level.

4. Provide teachers with visible examples of the application of objectives to the teaching-learning process.

5. Form functional teams for cooperative planning; define team roles of teachers involved.

6. Develop plans for broadening the team base with interns and non-certificated personnel.

7. Provide teachers with opportunity to practice the following roles: tutoring individuals working with independent study, participating in small-group interaction, and providing large-group instruction.

8. Understanding the basic choices provided through modular scheduling.

9. Determine through team effort the most efficient and effective modular combinations and sequences for each major subject area.

10. Develop through team effort the construction of a curriculum guide for the first nine weeks of school based on the previously listed activities.
11. Develop through team effort the selection of textbooks, programmed materials, library materials, tapes, records, films, and filmstrips needed for the first nine-week curricular program.

12. Develop through team effort the preparation of overhead projection visuals for large-group presentations needed for the first nine-week curricular program.

13. Provide opportunity and stimulus for team planning in curricular improvements and/or innovations other than those outlined in Toward Self-Direction.

14. Provide participants with some understanding of necessary pupil-evaluation procedures related to program objectives.

The principal-elect of the high school planned and directed the staff development program. He also provided almost all the instruction during the program since limited funds prohibited outside consultants.

A total of 90 hours was planned for participants during the school year. This time commitment was allocated to 35 hours on Saturdays for large-group instruction and 45 hours was allocated to small-group interaction and/or team meetings through released school time. In addition, the participants spent innumerable hours reading independently and participating in evening sessions of their team.

The program director not only developed extensive bibliographies, but purchased through school district
funds large numbers of paperback materials and selected resource books. Since the participants were teaching full time, their available hours for extensive reading were restricted. The director prepared handouts of key quotations and recommended practices from selected sources.

The inservice program schedule was as follows:

I. Orientation and Planning

A. Total Group Activities

1. Date: Saturday, October 25, 1963
2. Length of session: 5 hours
3. Agenda:
   a. Coffee hour and introductions
   b. Present the background of the project
   c. Administer the pretest of the semantic differential and the three remaining measurement instruments
   d. Distribute bibliographies and selected materials and books

B. Individual Activities

1. Read the book, Toward Self-Direction
2. Study behavioral goals for pupils relating to school-wide objectives and subject-area objectives

II. Educational Objectives and Values: School-wide Agreements

A. Total Group Activities

1. Date: Saturday, November 23, 1963
2. Length of session: 2.5 hours
3. Agenda:
a. Brief presentation on the topic
b. Discuss school-wide objectives in six buzz groups
c. Report to total group the buzz-group concerns

B. Individual Activities

1. Study related materials on objectives and values
2. Review rough draft of school-wide agreements sent to participants

III. Educational Objectives and Values:
Subject-area Agreements

A. Total Group Activities

1. Date: Saturday, December 14, 1963
2. Length of session: 2.5 hours
3. Agenda:
   a. Sample acceptance for school-wide objectives and values as outlined in rough draft form
   b. Brief presentation on topic of the day
   c. Discuss subject-area objectives in subject-area teams

4. Assignment:

   Subject-area teams to meet two times prior to the next total group meeting to develop subject-area agreements

B. Small Group or Team Activities

1. Dates:
   a. One meeting during the period, December 16-20, 1963
   b. One meeting during the period, January 6-10, 1964

2. Length of the two sessions: 2.5 hours for each meeting
3. Assignment:

Develop draft of subject-area agreements

C. Individual Activities

1. Study related materials on objectives and values for subject area
2. Review second draft of school-wide agreements
3. Clarify individual objectives and values for subject area

IV. Self-Direction of Students - The Concept

A. Total Group Activities

1. Date: Saturday, January 10, 1964
2. Length of session: 2.5 hours
3. Agenda:

   a. Present rough drafts of subject-area agreements to total group
   b. Review second draft of school-wide agreements with group
   c. Brief presentation on topic of day
   d. Discuss school-wide applications in six buzz groups
   e. Report to total group the buzz-group concerns

4. Assignment:

   Subject-area teams to meet two times prior to the next total group meeting to develop subject-area applications

B. Small Group or Team Activities

1. Dates:

   a. One meeting during the period, January 13-17, 1964
b. One meeting during the period, January 27-31, 1964

2. Length of the two sessions: 2.5 hours for each meeting

3. Assignment:

Develop rough draft of subject-area applications

C. Individual Activities

1. Study related materials on the concept
2. Clarify individual applications for subject area
3. Use one application of the concept with pupils prior to next group meeting

V. Small-Group Interaction - The Concept

A. Total Group Activities

1. Date: Saturday, February 1, 1964
2. Length of session: 2.5 hours
3. Agenda:

   a. Present rough drafts of subject-area applications of self-direction of students to total group
   b. Brief presentation on topic of the day
   c. Discuss school-wide applications in six buzz groups
   d. Report to total group the buzz-group concerns

4. Assignment:

Subject-area teams to meet prior to the next group meeting and develop subject-area applications

B. Small Group or Team Activities

1. Date: Meeting during the period, February 10-14, 1964
2. Length of session: 2.5 hours
3. Assignment:

Develop draft of subject-area applications

C. Individual Activities

1. Study related materials on the concept
2. Clarify individual applications for subject area
3. Use one application of the concept with pupils prior to next group meeting

VI. Large-Group Instruction - The Concept

A. Total Group Activities

1. Date: Saturday, February 22, 1964
2. Length of session: 5 hours
3. Agenda:

   a. Present rough drafts of subject-area applications of small-group instruction to total group
   b. Brief presentation on topic of the day
   c. Discuss school-wide applications in six buzz groups
   d. Report to total group the buzz-group concerns
   e. Audio-visual consultant to illustrate uses of visuals for large-group instruction
   f. Each participant to design and prepare one projectile for the overhead projector

4. Assignment:

Subject-area teams to meet prior to the next group meeting to develop subject-area applications
B. Small Group or Team Activities

1. Date: Meeting during the period, March 2-6, 1964
2. Length of session: 2.5 hours
3. Assignment:
   Develop draft of subject-area applications

C. Individual Activities

1. Study related materials on the concept
2. Clarify individual applications for subject area
3. Use one application of the concept with pupils prior to next group meeting

VII. Teaching Team Organization

A. Total Group Activities

1. Date: Saturday, March 7, 1964
2. Length of session: 2.5 hours
3. Agenda:
   a. Present rough drafts of subject-area applications of large-group instruction to total group
   b. Brief presentation on topic of the day
   c. Discuss school-wide applications in six buzz groups
   d. Report to total group the buzz-group concerns
   e. Present film illustrating teaching team relationships
   f. Discuss aspects of film interesting to group
4. Assignment:
   Subject-area teams to meet prior to the next group meeting to develop subject-area applications
B. Small Group or Team Activities

1. Date: Meeting during the period, March 16-20, 1964
2. Length of session: 2.5 hours
3. Assignment:
   Develop draft of subject-area applications

C. Individual Activities

1. Study related materials on the concept
2. Clarify individual relationships for subject area
3. Use one application of the concept with fellow teachers prior to the next group meeting

VIII. Scheduling for Team Teaching

A. Total Group Activities

1. Date: Saturday, March 21, 1964
2. Length of session: 2.5 hours
3. Agenda:
   a. Present rough drafts of subject-area applications of teaching team organization to total group
   b. Brief presentation on topic of the day
   c. Discuss school-wide applications in six buzz groups
   d. Report to total group the buzz-group concerns

4. Assignment:
   Subject-area teams to meet prior to the next group meeting to develop subject-area applications
B. Small Group or Team Activities

1. Date: Meeting during the period, March 30-April 3, 1964
2. Length of session: 2.5 hours
3. Assignment:

   Develop draft of subject-area applications

C. Individual Activities

1. Study related materials on the concept
2. Clarify individual applications for the subject area

IX. Curriculum Improvement

A. Total Group Activities

1. Date: Saturday, April 11, 1964
2. Length of session: 2.5 hours
3. Agenda:

   a. Present rough drafts of subject-area applications for scheduling of team teaching
   b. Brief presentation on topic of the day
   c. Discuss the subject-area applications in team groups

4. Assignment:

   Subject-area teams to meet two times prior to the next group meeting to develop subject-area agreements

B. Small Group or Team Activities

1. Dates:

   a. One meeting during the period, April 13-17, 1964
   b. One meeting during the period, April 20-24, 1964
2. Length of the two sessions: 2.5 hours for each meeting
3. Assignment:

Develop draft of subject-area agreements

C. Individual Activities

1. Study related materials in the subject area
2. Clarify individual position regarding subject matter selection

X. Evaluative Methods

A. Total Group Activities

1. Date: Saturday, May 2, 1964
2. Length of session: 2.5 hours
3. Agenda:

   a. Present rough drafts of subject area plans for curriculum improvement
   b. Brief presentation on topic of the day
   c. Discuss school-wide applications in buzz groups
   d. Report to total group of buzz-group concerns

4. Assignment:

   Subject-area teams to meet prior to the next group meeting to develop subject-area agreements

B. Small Group or Team Activities

1. Date: Meeting during the period, May 11-15, 1964
2. Length of session: 2.5 hours
3. Assignment:
Develop draft of subject-area agreements

C. Individual Activities

1. Study source materials on evaluation as related to teaching-learning processes outlined above
2. Attempt to describe a procedure of evaluation for a pupil in independent study, in small-group interaction and in large-group instruction

XI. Subject-area Program of Study

A. Total Group Activities

1. Date: Saturday, May 16, 1964
2. Length of session: 2.5 hours
3. Agenda:
   a. Present rough drafts of subject-area applications of evaluation for various processes
   b. Outline procedures and format necessary for a nine-week schedule and program of study
   c. Outline procedures for compilation of final reports on each topic outlined above
   d. Subject-area groups begin planning

4. Assignment:

   Subject-area teams to meet a minimum of four times prior to final meeting to complete materials

B. Small Group or Team Activities

1. Dates:
   a. Two meetings during the period, May 18-22, 1964
   b. One meeting during the period, May 25-29, 1964
c. One meeting during the period, June 1-5, 1964

2. Length of the session: 2.5 to 5 hours for each meeting as needed

3. Assignments:
   a. Compile final reports on each topic and/or concept studied during the inservice program
   b. Outline by subject area a nine-week schedule and program of study for the team and for each individual

XII. Culminating Activities

A. Total Group Activities

1. Date: Saturday, June 6, 1964
2. Length of session: 2.5 hours
3. Agenda:
   a. Review activities of the year
   b. Present the posttest of the semantic differential

B. Individual Activities

Continue planning as individuals and as members of subject-area teams for school opening in September, 1964

Every effort was made through the nine-month program to involve teachers in activities which reflected the objectives of the project; i.e., pupil self-direction in the learning process, small-group interaction, large-group instruction and team-teaching organization. Teachers not only were involved in these activities during the scheduled inservice
program, but were encouraged to use these activities with pupils in their classes when possible; e.g., contracts for independent study and small-group interaction.

**TESTING PROCEDURES**

The One-Group Pretest-Posttest Design\(^2\) was used in the study of participant attitudes, the dependent variable, through the use of the semantic differential. This instrument was administered at the first meeting of participants in October, 1963, and at the final meeting during June, 1964. The data used for the predictor or independent variables were collected as a pretest to the inservice program at the first meeting in October, 1963. (See Table 1)

\(^2\) Campbell and Stanley, "Experimental and Quasi-Experimental Designs for Research on Teaching," p. 177.
### Table 1
**PROCEDURAL FLOWCHART OF INSERVICE PROGRAM**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Inservice Training Program</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>October, 1963</td>
<td>1963-1964 Academic Year</td>
<td>June, 1964</td>
</tr>
</tbody>
</table>

**Measurement Instruments:**
- Semantic Differential
- Watson-Glaser
- Critical Thinking Appraisal
- Dogmatism Scale
- Consequences

The measurement data were submitted to the researcher with a three-digit code selected by each participant as his individual reference; in this manner, each participant retained a high degree of anonymity throughout the testing activities.

**THE DEPENDENT VARIABLE**

The semantic differential instrument was constructed by the researcher. The rationale for this type of measurement instrument has been presented in
Chapter III of this study; it is assumed that the validity and reliability statements presented for the semantic differential also apply to the instrument used in this study.

**Selection of Concepts**

Twenty concepts were selected for attitudinal measurement by participants. Ten of the twenty concepts were directly applicable to the purpose of the study and were used for collection of data. Three concepts related to the need for self-directed learning on the part of pupils as listed below:

1. STUDENT SELF-DIRECTION  
2. STUDENT SELF-APPRaisal  
3. INDEPENDENT STUDY

Three concepts related to the need for increased emphasis in the learning process for pupils interacting with others in small groups:

4. GROUP INTERACTION  
5. SOCIAL RELATIONSHIP LEARNINGS  
6. SMALL COOPERATIVE PLANNING GROUPS

One concept was directed specifically to large-group instruction:
7. LARGE GROUPS (LECTURE-DEMONSTRATION)

Three concepts related more generally to the organization of teaching staff to provide pupil opportunities to learn independently, in small groups and in large groups; these concepts are as follows:

8. TEACHING TEAM ORGANIZATION
9. FLEXIBLE SCHEDULING
10. NON-CERTIFICATED TEAM MEMBERS

The remaining ten concepts were of incidental concern to the study. These concepts tended to be of a general nature rather than specifically reflecting the problem areas and they tended to be less innovative in nature although important to a secondary school program. Thus, these concepts were used as buffer items and do not contribute to the statistical data in the study; e.g., GUIDANCE, AUDIO-VISUAL MATERIALS, EVALUATION, MODERN COMMUNICATION MEDIA, etc.

Selection of Polar Terms

Ten pairs of polar terms were selected for measuring participant attitudes in relation to educational concepts. The polar terms selected are
commonly used by Osgood and associates\(^3\) in the extensive research already done with the semantic differential.

The polar terms were selected on the basis of providing three dimensions commonly used in research with the semantic differential and with a heavy evaluative loading. These terms are listed as follows:

1. **Evaluative Factor**: simple/complex, idealistic/realistic, unfair/fair, unpleasant/pleasant, worthless/valuable, and stable/changeable

2. **Potency Factor**: weak/strong, stale/fresh

3. **Activity Factor**: tense/relaxed, passive/active

Factor analysis was not used in this study and all scores were summed across the factors. (See Chapter III).

The researcher designated the negative terms and the positive terms as outlined in Table 2 prior to submission of the measurement instrument to the jury.

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\(^3\) Osgood, *The Measurement of Meaning.*
Table 2

POLAR TERMS USED IN THE SEMANTIC DIFFERENTIAL

<table>
<thead>
<tr>
<th>Negative Terms</th>
<th>Positive Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Complex</td>
</tr>
<tr>
<td>Idealistic</td>
<td>Realistic</td>
</tr>
<tr>
<td>Unfair</td>
<td>Fair</td>
</tr>
<tr>
<td>Unpleasant</td>
<td>Pleasant</td>
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<tr>
<td>Worthless</td>
<td>Valuable</td>
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<tr>
<td>Weak</td>
<td>Strong</td>
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<tr>
<td>Stale</td>
<td>Fresh</td>
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<tr>
<td>Passive</td>
<td>Active</td>
</tr>
<tr>
<td>Tense</td>
<td>Relaxed</td>
</tr>
<tr>
<td>Stable</td>
<td>Changeable</td>
</tr>
</tbody>
</table>

Jury Review of Instrument

A jury of Ohio State University faculty members was selected on the basis of their interest in educational advance and their general ability to react to the validity of measurement instruments in the area of psychology and education. The jury included the following: Alexander Frazier, Egon Guba, Walter Hack, Andrew Hendrickson, Paul Klohr and Lyle Schmidt.

In response to the question as to the purpose of the enclosed opinionnaire (semantic differential instrument as seen in the Appendix), the jury was in agreement that the purpose was to measure subjects' feelings, attitudes and perceptions as related to
certain concepts in education. One respondent added that this instrument could provide a benchmark which ought to be used to measure changes in individual's thinking over a period of time—and it would be especially useful to evaluate specific training programs.

The jury also agreed that this form of the semantic differential is a satisfactory instrument for the purposes which were mentioned in the above paragraph. The polar terms were questioned by one jury member, so a second jury response sheet was sent to the persons responding to the original request.

Four persons responded to the second request: Alexander Frazier, Egon Guba, Andrew Hendrickson and Paul Klohr. These individuals agreed firmly that the semantic differential instrument can be utilized in attitude measurement. They also agreed that the instrument is an indirect approach to attitude measurement and would be relatively unthreatening to the subjects in the measurement of attitudes.

In the effort to establish directional or desired polarity, the jury was requested to review a list of terms suggested as having a negative
connotation and a list of terms suggested as having a positive connotation. The following polar terms were judged not to provide positive connotation with the number of jury members in parentheses: complex (2), relaxed (2), changeable (2), and realistic (1). The following polar terms were judged not to provide negative connotation with the number of jury members in parentheses: simple (3), stable (3), and idealistic (2).

On the basis of this evaluation by the jury, the following polar terms were not used in this study for the collection of data: simple/complex, stable/changeable, and idealistic/realistic. These polar combinations thus serve as buffer items in each concept measurement.

The remaining polar term questioned by the jury has been retained. This term, relaxed, has been used extensively by Osgood in his use of the semantic differential in the tense/relaxed polarization combination. In addition, these polar terms were considered necessary to present the activity factor in a study of the semantic differential measurement data;
however, the factors of the semantic differential were not used in this study.

**Measurement Procedures**

For purposes of scoring, the unfavorable or negative poles of the scale have been uniformly assigned the score "1" and the favorable or positive poles the score "7"; this regardless of the presentation of the scales to subjects in the graphic differential where they are randomized in direction. Then all ratings were summed over to obtain the attitude "score".

**THE INDEPENDENT VARIABLES**

Emphasis in this section is placed on the three measurement instruments used to secure data for four independent or predictor variables: (1) Watson-Glaser Critical Thinking Appraisal, (2) Dogmatism Scale (Opinionnaire), and (3) Consequences. The remaining three independent variables, formal education, teaching experience and sex, have been briefly described earlier in this chapter in the description of participants.

**Watson-Glaser Critical Thinking Appraisal**

This instrument offers a means for determining the relative level of a person's ability to think
critically with regard to problems involving recognition of logical implication, interpretation of data, discrimination between strong and weak arguments, recognition of unstated assumptions in reasoning, discrimination among degrees of probably inference, and other aspects of critical thinking.¹

A reviewer⁵ in The Third Mental Measurements Yearbook regarding an earlier form states that in addition to a straight-forward assessment of the ability to think critically, there are ingenious methods of assessing qualities of opinions and effects of opinion on the ability to think critically on particular problems.

The reviewer continues that the battery is perhaps as good as is likely to be made in practice though it does not appear to be perfect.

The Critical Thinking Appraisal instrument appears to have sufficient validity to be used for experimental purposes. Reliability coefficients

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range from .79 to .93 on inter-form reliabilities which are normally lower than split-half reliabilities.\textsuperscript{6}

**Dogmatism Scale**

The primary purpose of this scale is to measure individual differences in openness or closedness of belief systems. The extent to which a person's system is open is the extent to which the person can receive, evaluate, and act on relevant information received from the outside on its own intrinsic merits unencumbered by irrelevant factors in the situation, arising from within the person or from the outside.\textsuperscript{7}

Reliability of the Form E of the Dogmatism Scale ranged from .68 to .93 with groups in England and the United States including samples tested at Michigan State University, The Ohio State University, and at a Veterans' Administration domiciliary.\textsuperscript{8}

**Consequences**

This instrument is one of a large battery of group-administered tests which were developed in order to explore systematically the "structure of


\textsuperscript{7} Rokeach, *The Open and Closed Mind*. p. 57.

\textsuperscript{8} Ibid.
the intellect" and isolate the factors of divergent thinking. The consequences instrument is a printed test consisting of ten items each requiring the subject to list what the results might be if some unusual situation came to pass, as for example, "What would be the results if none of us needed food any more in order to live?" Relevant, nonduplicated responses are classified as "obvious" or "remote"; the frequency of the former yielding a score of ideational fluency and the latter a score on originality.⁹

A reviewer in The Sixth Mental Measurements Yearbook states that this is an interesting and ingenious test in a field where relatively few good tests are available. The reviewer adds that while guidelines and examples are given for differentiating remote and obvious responses, many of the distinctions made are tenuous at best. This author concludes by saying the instrument is recommended as a research instrument, particularly to explore its

usefulness in various decisions where flexibility and originality might be important.\footnote{Goldine C. Gleser, "Consequences," The Sixth Mental Measurements Yearbook, ed. by Oscar K. Buros (Highland Park, N. J.: The Gryphon Press, 1965), Item 547.}

Estimates of internal consistency reliability have been provided by the authors. The reliability coefficients for a young adult population ($N=200$) was $0.86$ for the obvious scores and $0.82$ for the remote scores indicating a fairly good level of accuracy.\footnote{Ibid.}

The studies undertaken by Guilford and his associates yield information on the construct of this test. The obvious score has an average validity of $0.62$ for ideational fluency on the samples above ($N=200$). The remote score has an average validity of $0.42$ for originality for the same adult population.\footnote{Christensen, Merrifield and Guilford, Consequences Manual for Administration, Scoring, and Interpretation, pp. 4-6.}

**Measurement Procedures**

The anonymously designated answer sheets were scored as indicated in the respective test manuals. The raw test scores were used for analysing data as reported in Table 4 in Chapter V.
TREATMENT OF DATA

The dependent variable data was generated through the pretest-posttest procedure; statistical comparisons of the data were made by means of Wilcoxon's matched pairs signed ranks test.

The relationship of each of the six independent variables other than sex was correlated with the dependent variable. The phi coefficient technique was used to relate sex to the dependent variable. The strength of relationship between two or more of the variables has been determined through the use of the multiple regression technique.

An analysis and interpretation of data are found in the next chapter.
CHAPTER V. AN ANALYSIS AND INTERPRETATION OF THE DATA

The design of this study required that several procedural steps be followed in the analysis and interpretation of data. These steps were based on the answering of important questions in a logical sequence.

The first and most significant question was to discover whether there was directional attitude change of the subjects from pretest to posttest. This question was important for all study hypotheses were confirmed if no significant directional change were found. However, if significant change were established, then several other questions would be raised in determining the predictive quality of the remaining data: Would general observation of the data present clues as to the techniques to be used in relating the several data? Would comparing the performance of those who changed the most in a positive direction with those who changed the least and/or in a negative direction be productive? Would the establishment of relationship between total group change to the scores of each independent variable be productive? And finally,
would combining two or more of the independent variables be productive in determining predictive relationships with the change data?

Each of these questions will be answered in the following analysis of available data. Thus, the answering of these questions established the procedural steps.

THE DEPENDENT VARIABLE OF ATTITUDE CHANGE

The dependent variable in this study is attitude change in a positive or desired direction. Data were collected through pretest and posttest administrations of the semantic differential instrument prior to and following the inservice program.

The subjects taking the semantic differential were mature, educated adults. Since it is assumed that attitudes are stable and dependable characteristics of adults, then the directional change of adult attitudes is an unusual phenomenon. Chance events and normal activities would not be expected to affect stable attitudes of educated adults during a nine-month period.

The difference between each item for each concept of the pretest and the posttest has been used in this
study to establish the measure of directional attitude change for each subject.

The change in attitude scores are presented in Table 3. The subject changing to the greatest extent in a positive direction is identified by the code number of 406 with a change score of 91. At the other end of the range is subject 191 with a negative score of -48; this subject changed, but in the direction away from the desired direction as established in the study procedure. A total of 19 subjects of the 30 in the study did have a positive change score. Ten subjects had a relatively small change score ranging from -10 to +10. Only 5 subjects had a relatively large negative score as compared to 15 subjects having a relatively large positive change score.

To determine whether there was significant directional change of the group, a nonparametric or distribution-free test was used. Most statistical tests commonly employed make some assumptions concerning the shape of the distribution in the population. Since the shape of the distribution is unknown and assumptions of normality cannot be met, a nonparametric statistical test was used.¹

Table 3
RANKING OF PARTICIPANTS AS RELATED TO THE DEPENDENT VARIABLE: POSTTEST LESS PRETEST DIRECTIONAL CHANGE

<table>
<thead>
<tr>
<th>Participant Codes</th>
<th>Attitude Change Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>406</td>
<td>91</td>
</tr>
<tr>
<td>964</td>
<td>82</td>
</tr>
<tr>
<td>735</td>
<td>77</td>
</tr>
<tr>
<td>124</td>
<td>66</td>
</tr>
<tr>
<td>829</td>
<td>65</td>
</tr>
<tr>
<td>402</td>
<td>50</td>
</tr>
<tr>
<td>522</td>
<td>49</td>
</tr>
<tr>
<td>505</td>
<td>48</td>
</tr>
<tr>
<td>919</td>
<td>34</td>
</tr>
<tr>
<td>538</td>
<td>31</td>
</tr>
<tr>
<td>250</td>
<td>27</td>
</tr>
<tr>
<td>892</td>
<td>27</td>
</tr>
<tr>
<td>523</td>
<td>21</td>
</tr>
<tr>
<td>950</td>
<td>21</td>
</tr>
<tr>
<td>527</td>
<td>19</td>
</tr>
<tr>
<td>542</td>
<td>10</td>
</tr>
<tr>
<td>872</td>
<td>7</td>
</tr>
<tr>
<td>712</td>
<td>6</td>
</tr>
<tr>
<td>204</td>
<td>3</td>
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<tr>
<td>714</td>
<td>-2</td>
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<tr>
<td>218</td>
<td>-4</td>
</tr>
<tr>
<td>628</td>
<td>-4</td>
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<tr>
<td>136</td>
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<tr>
<td>133</td>
<td>-47</td>
</tr>
<tr>
<td>191</td>
<td>-48</td>
</tr>
</tbody>
</table>
The matched-pairs signed ranks test as devised by Wilcoxon and illustrated by Cochran and Snedecor\(^2\) determined the significance probabilities for the attitude change or gain of the total sample. In this computation, the standard score was 2.38; when the standard score is greater than 1.96, the null hypothesis is rejected at the .05 level of confidence.

When a null hypothesis is rejected at the .05 level, there are only 5 chances in 100 that the conclusion is wrong and that the null hypothesis is actually true. The .05 level of confidence was considered as an acceptable statistical significance for this study.

The null hypothesis rejected in the computation described above was as follows: the inservice education will not result in a measurable shift of attitudes on the part of the participant in relation to the objectives of the inservice education experience. In fact, there was a measurable shift of attitudes and this shift was in a desired or positive direction. A statistically significant change in teacher attitudes was accomplished during the inservice program.

Since the first question in the analysis of data was answered affirmatively, the remaining data were studied to determine relationship or predictive qualities in terms of the dependent variable, attitude change. In this manner the remaining null hypotheses were tested.

OBSERVATION OF INDEPENDENT VARIABLES IN RELATION TO ATTITUDE CHANGE

The independent variables are presented in Table 4 in relation to the attitude change scores. The subject identified by code number 406 had the highest attitude change score of 91, was female, had 5 years of formal education and 9 years of teaching experience prior to the inservice program; this subject had scores of 61 on critical thinking, 113 on openness to change, 13 on originality and 34 on ideational fluency in the testing done prior to the inservice program. At the other extreme of attitude change scores is subject 191 with a negative change score of -48; the data for this subject is presented in the same manner as the subject above.

In an attempt to identify predictive qualities of the independent variables, the data in Table 4 were studied. It can be seen readily that the subjects
Table 4

CHART OF INDEPENDENT VARIABLES ORDERED TO CORRESPOND WITH ATTITUDE CHANGE SCORES

<table>
<thead>
<tr>
<th>Code</th>
<th>Attitude Change</th>
<th>Sex</th>
<th>Formal Education</th>
<th>Teaching Experience</th>
<th>Critical Thinking</th>
<th>Openness to Change</th>
<th>Originality</th>
<th>Fluency</th>
</tr>
</thead>
<tbody>
<tr>
<td>406</td>
<td>91</td>
<td>F</td>
<td>5</td>
<td>9</td>
<td>61</td>
<td>113</td>
<td>13</td>
<td>34</td>
</tr>
<tr>
<td>964</td>
<td>82</td>
<td>M</td>
<td>5</td>
<td>9</td>
<td>73</td>
<td>117</td>
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<td>29</td>
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<tr>
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<td>F</td>
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<td>F</td>
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<td>61</td>
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<td>F</td>
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<td>53</td>
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<tr>
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<td>F</td>
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<td>5</td>
<td>73</td>
<td>174</td>
<td>17</td>
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<tr>
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<td>M</td>
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<tr>
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<td>14</td>
<td>83</td>
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<tr>
<td>889</td>
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<td>M</td>
<td>5</td>
<td>12</td>
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<tr>
<td>781</td>
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<td>2</td>
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<td>70</td>
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<td>606</td>
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<td>12</td>
<td>74</td>
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<td>49</td>
</tr>
<tr>
<td>320</td>
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<td>M</td>
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<td>0</td>
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<td>28</td>
<td>67</td>
</tr>
<tr>
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<td>F</td>
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<td>79</td>
<td>130</td>
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<td>52</td>
</tr>
<tr>
<td>191</td>
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<td>F</td>
<td>5</td>
<td>15</td>
<td>79</td>
<td>162</td>
<td>26</td>
<td>70</td>
</tr>
</tbody>
</table>
which changed most in a positive direction were predominately females and those which changed least, or in a negative direction, were predominately males. No other observable patterns emerged from this perusal of the Table but more detailed analysis was made to determine whether any relationships, in fact, did exist.

COMPARISON OF SPLIT HALVES

The next procedure was to divide the sample into two groups: (1) the 15 subjects who changed to a relatively high degree in a positive direction and (2) the 15 subjects who changed very little in the positive direction and/or those who changed in a negative direction.

Sex of the subjects was treated separately from the other six independent variables. Data presented in Table 4 show that of the 15 subjects in the High Change Group there were 13 female subjects and 2 male subjects. The Table also shows that there were 7 female subjects and 8 male subjects in the Low Change Group.

A technique known as the phi coefficient\(^3\) was used to provide a correlation since there were data

---

available in a dichotomous form for the two groups. The phi correlation technique for this computation presented a score of 5.43. This score was greater than the score of 5.41 needed to establish statistical significance at the .02 level of confidence; .05 was the level of confidence established in this study for significance.

The null hypothesis that the sex of the participant is not related to measured change in attitudes was rejected through the use of the phi correlation technique. Thus, in this study, sex had an important relationship to attitudinal change. The correlation indicated that women changed in a positive direction significantly more than did the men in this study.

Table 5 presents data for the remaining independent variables in terms of split halves comparisons.

When the ranges of the High Change Group and the Low Change Group are compared, the similarity is rather obvious between the ranges of each variable. The ranges tend to be broad in both groups; e.g., the range for the High Change Group on teaching experience is 0-29 while the range for the Low Change Group on teaching experience is 0-26. The exception to the above statement is the variable of formal education.
Table 5
SUMMARY DATA OF SPLIT HALVES COMPARISONS

<table>
<thead>
<tr>
<th>Independent Variables Other Than Sex</th>
<th>High Change Group</th>
<th>Low Change Group</th>
<th>Differences Between The Means; High Less Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formal Education * i</td>
<td>RANGE : 4-6</td>
<td>MEAN : 4.80</td>
<td>RANGE : 2-6</td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>0-29 : 11.00</td>
<td>0-26 : 7.93</td>
<td>3.07</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>49-86 : 70.80</td>
<td>48-83 : 71.33</td>
<td>-.53</td>
</tr>
<tr>
<td>Originality</td>
<td>11-34 : 20.60</td>
<td>9-31 : 19.00</td>
<td>1.60</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>28-68 : 46.20</td>
<td>27-81 : 48.60</td>
<td>-2.40</td>
</tr>
</tbody>
</table>
For this variable the range in years for the High Change Group was 4-6 as compared with the range of 2-6 for the other group; however, the ranges would have been identical without the inclusion of the one 2-year subject in the study.

The comparison of the means of the split half groups provided some differences. Three of the variables presented differences of the means which were tested for statistical significance. The means of the variables, teaching experience, originality and ideational fluency, were tested through the use of the t ratio or Student's t test. The t value is a deviation divided by a standard deviation; the difference between the means is the deviation and the standard error of the difference between the means is the standard deviation.4

None of the t values generated were adequate to establish statistical significance of .05 as required in this study.

The broad range within each group and the similarity of the ranges may have contributed to a relatively high standard error.

Thus, the split halves comparisons established statistical significance only for the relationship between sex and attitude change. No significant relationship was established for the remaining six independent variables and the dependent variable of attitude change.

FURTHER COMPARISON OF DATA

A next step in the analysis of the data was the establishment of relationship between each independent variable and the dependent variable for the total group of subjects in the study. Each of the six independent variables other than sex was related to the dependent variable to establish a correlation coefficient and $t$ value. The correlation and $t$ value scores are presented in Table 6.

Sex of participants are not included in this computation since the nominal presentation of data does not mix with the ordinal presentation of data of the remaining six independent variables in the regression routine used for this study. However, the matched-pairs signed ranks test, although a less powerful test for relationship, has already established a statistically significant relationship of sex to attitude change, the dependent variable.
**Table 6**

**CORRELATION OF EACH INDEPENDENT VARIABLE WITH THE DEPENDENT VARIABLE**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal Education</td>
<td>4.73</td>
<td>.78</td>
<td>.12</td>
<td>9.75</td>
<td>10.46</td>
<td>.93</td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>9.47</td>
<td>7.83</td>
<td>.03</td>
<td>-.05</td>
<td>1.00</td>
<td>-.05</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>71.07</td>
<td>10.18</td>
<td>-.09</td>
<td>-.10</td>
<td>.76</td>
<td>-.12</td>
</tr>
<tr>
<td>Openness to Change</td>
<td>138.60</td>
<td>18.67</td>
<td>-.10</td>
<td>.29</td>
<td>.47</td>
<td>.61</td>
</tr>
<tr>
<td>Originality</td>
<td>19.80</td>
<td>6.93</td>
<td>-.03</td>
<td>.00</td>
<td>1.11</td>
<td>.00</td>
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<tr>
<td>Ideational Fluency</td>
<td>47.40</td>
<td>15.52</td>
<td>-.28</td>
<td>-.89</td>
<td>.57</td>
<td>-1.58</td>
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</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
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</tbody>
</table>
In Table 6 data were provided for the following purposes: The mean to describe the central tendency of each distribution of scores; the standard deviation to establish the variability of each distribution of scores; the correlation coefficient to show relationship between two means; and the \( t \) value to provide the significance of the differences between two means.

Each of the correlation coefficients indicated for the six independent or predictor variables was low. Two of the independent variables, formal education and teaching experience, had low and positive correlations. The remaining four independent variables, critical thinking, openness to change, originality and ideational fluency, were low and had negative correlations. The correlations were low when compared to perfect correlation which is 1.0.

A \( t \) value greater than 1.96 is necessary to provide statistical significance for the relationship between the mean of each independent variable and the mean of the dependent variable. Two of the \( t \) values were substantially closer to the required 1.96; the \( t \) value for formal education was \( .93 \) and the \( t \) value for ideational fluency was \( -1.58 \).

The following hypotheses of this study were confirmed:
(2) the critical thinking ability of the participant is not related to measured change in participant attitudes; (3) the openness to change score of the participant is not related to measured change in participant attitudes; (4) the originality score of the participant is not related to measured change in participant attitudes; (5) the ideational fluency score of the participant is not related to measured change in participant attitudes; (6) the relative length of formal education of the participant is not related to measured change in participant attitudes; and (7) the relative length of teaching experience of the participant is not related to measured change in participant attitudes.

MULTIPLE CORRELATIONS OF INDEPENDENT VARIABLES WITH THE DEPENDENT VARIABLE

When the above evidence indicated that there was no statistically significant correlation between each independent variable other than sex and the dependent variable, the possibility remained that the combination of two or more independent variables might establish statistically significant correlation and thereby present a predictor relationship. The multiple regression technique was used to determine the
multiple correlation of several combinations of independent or predictor variables to the dependent or criterion variable. Six combinations were selected as representative of possible combinations; these are listed as follows:

Combination I

- Formal Education
- Teaching Experience
- Critical Thinking
- Openness to Change
- Originality
- Ideational Fluency

Combination II

- Formal Education
- Teaching Experience

Combination III

- Critical Thinking
- Openness to Change
- Originality
- Ideational Fluency

Combination IV

- Critical Thinking
- Openness to Change

Combination V

- Openness to Change
- Originality

Combination VI

- Critical Thinking
- Ideational Fluency
The multiple correlation, the standard error of estimate, and the analysis of variance are presented in table form for each of the above combinations in this chapter. The multiple correlation is presented to indicate the relationship of the combination of independent variables to the dependent variable; the standard error of estimate is presented as a means of determining the accuracy of the multiple correlation prediction. The \( F \) ratio was used to determine whether there was a statistically significant difference between the means in each combination.

**Six-Predictor Multiple Correlation - Combination I**

All of the independent or predictor variables other than sex were included in the first multiple correlation study. The multiple correlation of these predictor variables with the dependent or criterion variable was .35 with a standard error of estimate of 38.11 (see Table 7). This is a low correlation and has limited significance. This figure did provide a larger multiple correlation than the correlation of any single predictor variable with the dependent variable.

An analysis of variance was computed for the six-predictor multiple correlation; Table 8 presents the
Table 7
SIX-PREDICTOR MULTIPLE CORRELATION - COMBINATION I

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
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<td>Formal Education</td>
<td>4.73</td>
<td>.78</td>
<td>.12</td>
<td>9.75</td>
<td>10.46</td>
<td>.93</td>
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<td>Teaching Experience</td>
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<tr>
<td>Originality</td>
<td>19.80</td>
<td>6.93</td>
<td>-.03</td>
<td>.00</td>
<td>1.11</td>
<td>.00</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>47.40</td>
<td>15.52</td>
<td>-.28</td>
<td>-.89</td>
<td>.57</td>
<td>-1.58</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .35
Standard Error of Estimate: 38.11
sources of variation, degrees of freedom, sum of squares, mean squares and the $F$ value. The .05 level of confidence was selected as the limit of statistical significance for this study. The $F$ value of .53 showed that the level of confidence was not significant since the minimum statistical requirement of significance at the .05 level is 2.53.

Table 8
SIX-PREDICTOR MULTIPLE CORRELATION - COMBINATION I
ANALYSIS OF VARIANCE FOR THE REGRESSION

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>6</td>
<td>4591.42</td>
<td>765.24</td>
<td>.53</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>23</td>
<td>33411.28</td>
<td>1452.66</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two-Predictor Multiple Correlation - Combination II
The multiple correlation of formal education and teaching experience with the dependent variable is seen in Table 9. The multiple correlation is very low at .12 and there is a standard error of estimate of 37.25.
Table 9
TWO-PREDICTOR MULTIPLE CORRELATION - COMBINATION II

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal Education</td>
<td>4.73</td>
<td>.78</td>
<td>.12</td>
<td>5.86</td>
<td>9.68</td>
<td>.61</td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>9.47</td>
<td>7.83</td>
<td>.03</td>
<td>-.09</td>
<td>.97</td>
<td>-.10</td>
</tr>
<tr>
<td>Dependent Variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .12
Standard Error of Estimate: 37.25
Table 10 provides the analysis of variance relating to the above computation. The $F$ value is .20; and $F$ value of 3.35 would be needed to meet the minimal statistical requirement of significance at the .05 level.

Table 10

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>$F$ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>2</td>
<td>548.46</td>
<td>274.23</td>
<td>.20</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>27</td>
<td>37454.24</td>
<td>1387.19</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Four-Predictor Multiple Correlation - Combination III

Table 11 indicates that the multiple correlation was .29 for the following four predictors in relation to the dependent variable: critical thinking, openness to change, originality, and ideational fluency. This correlation was relatively low; the standard error of estimate was 37.31.

Table 12 provides the analysis of variance relating to the above statement of correlation. The $F$ value of
Table 11
FOUR-PREDICTOR MULTIPLE CORRELATION - COMBINATION III

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>71.07</td>
<td>10.18</td>
<td>-.09</td>
<td>-.16</td>
<td>.74</td>
<td>-.22</td>
</tr>
<tr>
<td>Openness to Change</td>
<td>138.60</td>
<td>18.67</td>
<td>-.10</td>
<td>.13</td>
<td>.43</td>
<td>.31</td>
</tr>
<tr>
<td>Originality</td>
<td>19.80</td>
<td>6.93</td>
<td>-.03</td>
<td>.12</td>
<td>1.08</td>
<td>.11</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>47.40</td>
<td>15.52</td>
<td>-.28</td>
<td>-.72</td>
<td>.53</td>
<td>-1.37</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .29
Standard Error of Estimate: 37.31
.58 is not significant statistically since a minimum of 2.76 is needed at the .05 level.

Table 12
FOUR-PREDICTOR MULTIPLE CORRELATION - COMBINATION III
ANALYSIS OF VARIANCE FOR THE REGRESSION

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>4</td>
<td>3202.18</td>
<td>800.55</td>
<td>.58</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>25</td>
<td>34800.51</td>
<td>1392.02</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two-Predictor Multiple Correlation - Combination IV

Table 13 shows that the multiple correlation was .12 with a standard error of estimate of 37.23 when critical thinking and openness to change were related to the dependent variable.

The F value as seen in Table 14 derived from analysis of variance for the variables listed above was .21. A value of 3.35 would be needed as an F value to establish statistical significance at the .05 level.
Table 13
TWO-PREDICTOR MULTIPLE CORRELATION - COMBINATION IV

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>71.07</td>
<td>10.18</td>
<td>-.09</td>
<td>-.28</td>
<td>.70</td>
<td>-.40</td>
</tr>
<tr>
<td>Openness to Change</td>
<td>138.60</td>
<td>18.67</td>
<td>-.10</td>
<td>-.16</td>
<td>.38</td>
<td>-.42</td>
</tr>
<tr>
<td><strong>Dependent Variables</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .12
Standard Error of Estimate: 37.23
Two-Predictor Multiple Correlation - Combination IV

Analysis of Variance for the Regression

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>2</td>
<td>574.59</td>
<td>287.30</td>
<td>.21</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>27</td>
<td>37428.11</td>
<td>1386.23</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two-Predictor Multiple Correlation - Combination V

When the predictors of openness to change and originality were related to the dependent variable, a multiple correlation of .10 was established; there was a standard error of estimate of 37.33 (see Table 15).

The $F$ value derived from analysis of variance for the variables listed was .13 (see Table 16). An $F$ value of 3.35 is needed to establish statistical significance at the .05 level.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Openness to Change</td>
<td>138.60</td>
<td>18.67</td>
<td>-.10</td>
<td>-.18</td>
<td>.37</td>
<td>-.49</td>
</tr>
<tr>
<td>Originality</td>
<td>19.80</td>
<td>6.93</td>
<td>-.03</td>
<td>-.12</td>
<td>1.01</td>
<td>-.12</td>
</tr>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .10
Standard Error of Estimate: 37.33
Table 16

TWO-PREDICTOR MULTIPLE CORRELATION - COMBINATION V
ANALYSIS OF VARIANCE FOR THE REGRESSION

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>2</td>
<td>374.03</td>
<td>187.02</td>
<td>.13</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>27</td>
<td>37828.67</td>
<td>1393.65</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two-Predictor Multiple Correlation - Combination VI

The multiple correlation of critical thinking and ideational fluency with the dependent variable is given in Table 17. A relatively low correlation of .28 was established with a standard error of estimate of 35.98.

The F value derived from analysis of variance for the variables above was 1.18. The F value of 3.35 is needed to establish statistical significance at the .05 level (see Table 18).
Table 17
TWO-PREDICTOR MULTIPLE CORRELATION - COMBINATION VI

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Correlation with the Dependent Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error of Regression Coefficient</th>
<th>Computed T Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>71.07</td>
<td>10.18</td>
<td>-.09</td>
<td>-.12</td>
<td>.67</td>
<td>-1.17</td>
</tr>
<tr>
<td>Ideational Fluency</td>
<td>47.40</td>
<td>15.52</td>
<td>-.28</td>
<td>-.64</td>
<td>.44</td>
<td>-1.45</td>
</tr>
<tr>
<td>Dependent Variable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude Change</td>
<td>18.10</td>
<td>36.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Correlation: .28
Standard Error of Estimate: 35.98
Table 18

TWO-PREDICTOR MULTIPLE CORRELATION - COMBINATION VI
ANALYSIS OF VARIANCE FOR THE REGRESSION

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Squares</th>
<th>F Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributable to Regression</td>
<td>2</td>
<td>3050.98</td>
<td>1525.49</td>
<td>1.18</td>
</tr>
<tr>
<td>Deviation from Regression</td>
<td>27</td>
<td>34951.71</td>
<td>1294.51</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>29</td>
<td>38002.70</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Findings obtained by the multiple regression technique indicated that extremely low correlations were determined when related to the dependent variable. The consistently low multiple correlation was maintained throughout the six tests involving various combinations of predictors. The one best correlation was when all six predictor variables were used as seen in Table 7.

No $F$ value in the several analyses of variance provided significance close to the required .05 level of confidence.

The conclusion must be made that no combination of the six independent variables used in this study provided prediction qualities approaching statistical significance. The following null hypothesis was
confirmed: (9) the six independent variables other than sex do not intercorrelate when related to measured change in participant attitudes.

Summary, conclusions, and implications based on the findings of this study will be presented in Chapter VI.
CHAPTER VI. SUMMARY, CONCLUSIONS AND IMPLICATIONS OF THE STUDY

SUMMARY

Purpose and Nature of the Study

The purpose of this study was to determine the relative attitudinal change of participants following a nine-month inservice educational experience and to relate these changes to the participants' scores on scales measuring critical thinking, openness to change, originality and ideational fluency and to the factors of formal education, teaching experience and sex.

Nine null hypotheses were used as a basis for the study as follows:

1. The inservice education program will not result in a measurable shift of attitudes on the part of the participant in relation to the objectives of the inservice education experience.
2. The critical thinking ability of the participant is not related to measured change in participant attitudes.
3. The openness to change score of the participant is not related to measured change in participant attitudes.

4. The originality score of the participant is not related to measured change in participant attitudes.

5. The ideational fluency score of the participant is not related to measured change in participant attitudes.

6. The relative length of formal education of the participant is not related to measured change in participant attitudes.

7. The relative length of teaching experience of the participant is not related to measured change in participant attitudes.

8. The sex of the participant is not related to measured change in participant attitudes.

9. The six independent variables other than sex do not intercorrelate when related to measured change in participant attitudes.

The participants in the study were 30 teachers who had requested to be on the staff of an experimental school and had agreed to participate in the inservice program. The inservice program objectives have been outlined in Chapter II; of these, four major concepts
were developed throughout the inservice program as being of major importance to the teachers as they planned for the new school. The four concepts are listed as follows:

1. Self-direction on the part of pupils
2. Small group interaction on the part of pupils
3. Large group instruction for pupils
4. Team teaching organization for teaching staff

In moving from older concepts of school curriculum and organization to a different form of secondary school, teachers were required to develop a new orientation and at the same time develop positive attitudes regarding this orientation. Through a lengthy process of re-education, the majority of the teachers were helped to achieve new insights and new attitudes in a positive direction in terms of program objectives.

A measurement instrument was developed to measure this change of attitude from the beginning to the end of the nine-month inservice program. The theoretical construct for a semantic differential instrument to measure attitudinal change was presented in Chapter III. Evidence was presented indicating that attitudes can change, that the direction of change can be determined and that attitude change can be assessed in quantitative terms.
Chapter IV presented the design of this study and discussed the nature of the experience provided for the subjects. The teachers in the inservice program were involved in activities which reflected the objectives of the project and were encouraged to use these activities with pupils in their classes during the inservice program. The role of the director of the inservice program was characterized by a concern for helping teachers better understand the values of teaching-learning activities which promoted pupil self-direction, small group interaction, large group instruction and team teaching organization.

By measuring the attitudes of teachers in reference to the four concepts prior to the program and again following the program, it was possible to formulate an experimental design to test the nine hypotheses. The data for attitude change constituted the dependent variable. The data for four independent variables or predictor variables were collected by testing prior to the inservice program; the remaining data were secured through the use of an information request sheet at the beginning of the inservice program.

All measurement data were submitted to the researcher with a three-digit code selected by each participant as his individual reference; in this manner
each participant retained a high degree of anonymity throughout the testing activities.

It was thought that findings from a study of this nature could (1) assist educators in selecting people who are more likely to benefit from educational experiences in which the learner accepts major responsibility for learning and in which teachers plan and teach cooperatively; and (2) assist in the predication of the kinds of teachers most likely to provide the attitudes which seem both necessary and sufficient for comprehensive change in secondary education.

Summary of Findings

Findings from this study are presented in four parts. Each part will be related to the procedure used to test the hypotheses.

Attitude Change of the Subjects

The comparison of semantic differential scores secured through pretest and posttest indicates that the participants changed attitudes in a positive direction. This change was significant at the .05 level of confidence.

The hypothesis (1) that the inservice program would not result in a measurable shift of attitudes
on the part of the participant in relation to the objectives of the inservice education experience was rejected.

Since the changes made were in a positive direction, there is evidence to indicate that conditions for such changes were prevalent in the inservice program.

This change in attitudes in a positive direction was especially important when it is remembered that each of the participants could be characterized as being interested in instructional improvement and were generally supportive of the objectives of the project as reflected on the pretest of the semantic differential. There was a certain aura of excitement and anticipation in reacting to the program objectives for the first time. On the other hand, at the end of the nine-month program, a realism had developed which removed much of the excitement and left the reality of hard work and the complexity of translating objectives into procedures in the teaching-learning arena.

Comparison of Split Halves

The sex of participants was found to be a significant independent variable in relation to attitude change. The female participants outnumbered the men in the High Change Group 13 to 2. The phi correlation
technique presented evidence that this relationship was statistically significant at the .02 level of confidence; .05 was the level of confidence established in this study for significance.

Thus, hypothesis (8) that the sex of the participant is not related to measured change in participant attitudes was rejected.

None of the remaining variables provided evidence sufficient to reject other relationship hypotheses.

Comparison of Total Group (30) Attitude Scores with the Independent Variables

Each of the six independent variables other than sex was related to the dependent variable to establish a correlation coefficient and a \( t \) value. Each correlation coefficient was low and no \( t \) value approached statistical significance at the .05 level of confidence.

The following hypotheses were confirmed: (2) the critical thinking ability of the participant is not related to measured change in participant attitudes; (3) the openness to change score of the participant is not related to measured change in participant attitudes; (4) the originality score of the participant is not related to measured change in participant attitudes;
(5) the ideational fluency score of the participant is not related to measured change in participant attitudes; (6) the relative length of formal education of the participant is not related to measured change in participant attitudes; and (7) the relative length of teaching experience of the participant is not related to measured change in participant attitudes.

Multiple Correlations of Independent Variables other than Sex to the Dependent Variable

Six combinations of independent variables were related to the dependent variable to provide a multiple correlation and an $F$ value. The multiple correlations were low and no $F$ value proved to be sufficient for statistical significance at the .05 level of confidence.

Hypothesis (9) that the six independent variables other than sex do not intercorrelate when related to measured change in participant attitudes was confirmed.

CONCLUSIONS

The following conclusions were judged to be supported by the findings of this investigation:

1. The nine-month inservice program apparently provided the necessary and sufficient conditions for positive attitude change to occur.
2. The amount of positive directional attitude change of participants was significant.

3. The women in this study changed in a positive direction to a significantly greater degree than did the men in the study.

4. The remaining six predictor variables appeared to have little or no predictive value in terms of attitude change.

5. Multiple correlations of various combinations of the remaining six predictor variables have little or no predictive value in terms of attitude change.

IMPLICATIONS

Implications for Education

The investigation of attitudinal change of teachers has relevance for education because of current demands upon the schools and upon teachers to provide a different educational environment. Many educational objectives of the last decade are derived from concerns for helping all educable youth to participate in their own learning process in school and throughout their lifetime and be a productive member of small and large groups in school and in adult life. In addition,
teachers are learning to work cooperatively with fellow professionals in planning and executing activities for and with young people.

Attitude change in teachers is essential if education is to be responsive to the dynamic needs of society. Teacher training programs should consider seriously the heavy hand of tradition and establish learning opportunities for pre-teaching young people to break from the teaching-learning processes which they have experienced throughout their school years. The desire to improve educational processes could be an important aspect of any teacher-training program.

The evidence of this study appear to support a tenable case for the need to provide laboratory experiences which demonstrate and exemplify the objectives of a program. Thereby, written objectives are translated into recognizable procedures and activities.

From the review of available literature, there has been limited effort to develop inservice training programs or staff development programs with a systematic evaluative procedure within the program. The origin of this study was the belief that such a program plan with evaluation would be highly desirable and worthwhile. A conclusion of this study is that the
evaluation provides evidence of the value of an in-service experience. This procedure also provides impetus for inservice program improvement.

Perhaps similar educational experiences and evaluation procedures would be of benefit when used in the following: (1) other staff development programs, (2) administrative-teacher relationships, (3) school-community relationships and (4) teacher-pupil relationships.

Implications for Research

This study has produced some significant findings in looking more closely at characteristics of the teacher that permit him to be capable of making positive change when confronted with new data. Variables in this study represent only a few of a large number of variables that should be investigated if researchers wish to manage situations to provide conditions conducive to attitude change. To this extent this study is a beginning which brings to mind many questions that can only be answered through additional research.

Unanswered questions seem to fall into five groups of variables which are listed as follows: (1) the characteristics of the instructor, (2) the amount and kind of interactions between instructor and learners
and among learners, (3) the characteristics of the learner such as mental development and the level of social-emotional development, (4) the physical characteristics of the setting such as space, supplies, instructional materials and equipment and (5) the outside forces acting upon the instructor and learners.

The matter of selecting individuals for teaching is one of the most persistent and perplexing problems in education. This study may stimulate research on characteristics of prospective teachers as to the ability to change or to grow on the job and thereby stress the importance of long-term inservice training for educational change.
APPENDIX
As you know, concepts play an important role in an in-service program. We should like your help in finding out what some of these concepts mean to you. We shall use rating scales such as this:

**IN-SERVICE PROGRAM**

Simple: ___: ___: ___: ___: ___: ___: Complex

If you placed an "X" in a space between two colons, you would show the direction and intensity of your association of "In-service Program" with respect to the polar adjectives, "simple" and "complex."

For example, if you felt that "In-service Program" was neither "simple" nor "complex," you would place your "X" in the middle space as follows:

Simple: ___: ___: ___: X: ___: ___: ___: Complex

Suppose that you felt that the "In-service Program" was "simple". You would then mark the scale as shown below:

**IN-SERVICE PROGRAM**

Simple: ___: X: ___: ___: ___: ___: ___: Complex

Similarly, suppose that you felt that "In-service Program" was very "complex." You would then mark the scale like the example below:

**IN-SERVICE PROGRAM**

Simple: ___: ___: ___: ___: ___: ___: ___: X: Complex

On the pages which follow, please enter your reaction to the concept in question by placing an "X" at the appropriate point on each of the scales. Please work as quickly as you can. Complete your responses to one concept before going on to the next. Be sure to mark every scale.

Thank you.
EXAMPLE:

IN-SERVICE PROGRAM

Simple: ___: X: ___: ___: ___: ___: Complex
Idealistic: ___: ___: ___: X: ___: ___: ___: Realistic
Fair: ___: ___: X: ___: ___: ___: ___: Unfair
Unpleasant: ___: ___: ___: ___: X: ___: ___: Pleasant, Etc.
TEACHING TEAM ORGANIZATION

Simple: ______: ______: ______: ______: ______: ______: ______: ______: ______: Complex
Idealistic: ______: ______: ______: ______: ______: ______: ______: ______: ______: Realistic
Fair: ______: ______: ______: ______: ______: ______: ______: ______: ______: Unfair
Unpleasant: ______: ______: ______: ______: ______: ______: ______: ______: ______: Pleasant
Valuable: ______: ______: ______: ______: ______: ______: ______: ______: ______: Worthless
Weak: ______: ______: ______: ______: ______: ______: ______: ______: ______: Strong
Fresh: ______: ______: ______: ______: ______: ______: ______: ______: ______: Stale
Passive: ______: ______: ______: ______: ______: ______: ______: ______: ______: Active
Tense: ______: ______: ______: ______: ______: ______: ______: ______: ______: Relaxed
Stable: ______: ______: ______: ______: ______: ______: ______: ______: ______: Changeable

COOPERATIVE PLANNING

Simple: ______: ______: ______: ______: ______: ______: ______: ______: ______: Complex
Idealistic: ______: ______: ______: ______: ______: ______: ______: ______: ______: Realistic
Fair: ______: ______: ______: ______: ______: ______: ______: ______: ______: Unfair
Unpleasant: ______: ______: ______: ______: ______: ______: ______: ______: ______: Pleasant
Valuable: ______: ______: ______: ______: ______: ______: ______: ______: ______: Worthless
Weak: ______: ______: ______: ______: ______: ______: ______: ______: ______: Strong
Fresh: ______: ______: ______: ______: ______: ______: ______: ______: ______: Stale
Passive: ______: ______: ______: ______: ______: ______: ______: ______: ______: Active
Tense: ______: ______: ______: ______: ______: ______: ______: ______: ______: Relaxed
Stable: ______: ______: ______: ______: ______: ______: ______: ______: ______: Changeable
VARYING CLASS SIZE

Simple: __:__:__:__:__:__:__:__ : Complex
Idealistic: __:__:__:__:__:__:__ : Realistic
Fair: __:__:__:__:__:__:__ : Unfair
Unpleasant: __:__:__:__:__:__:__ : Pleasant
Valuable: __:__:__:__:__:__:__ : Worthless
Weak: __:__:__:__:__:__:__ : Strong
Fresh: __:__:__:__:__:__:__ : Stale
Passive: __:__:__:__:__:__:__ : Active
Tense: __:__:__:__:__:__:__ : Relaxed
Stable: __:__:__:__:__:__:__ : Changeable

FLEXIBLE SCHEDULING

Simple: __:__:__:__:__:__:__ : Complex
Idealistic: __:__:__:__:__:__:__ : Realistic
Fair: __:__:__:__:__:__:__ : Unfair
Unpleasant: __:__:__:__:__:__:__ : Pleasant
Valuable: __:__:__:__:__:__:__ : Worthless
Weak: __:__:__:__:__:__:__ : Strong
Fresh: __:__:__:__:__:__:__ : Stale
Passive: __:__:__:__:__:__:__ : Active
Tense: __:__:__:__:__:__:__ : Relaxed
Stable: __:__:__:__:__:__:__ : Changeable
NON-CERTIFICATED TEAM MEMBERS

Idealistic: Simple: Simple: Simple: Simple: Realistic
Fair: Simple: Simple: Simple: Unfair
Unpleasant: Simple: Simple: Pleasant
Valuable: Simple: Simple: Worthless
Weak: Simple: Simple: Strong
Fresh: Simple: Simple: Stale
Passive: Simple: Simple: Active
Tense: Simple: Simple: Relaxed
Stable: Simple: Simple: Changeable

MODERN COMMUNICATION MEDIA

Simple: Simple: Simple: Simple: Simple: Complex
Idealistic: Simple: Simple: Simple: Realistic
Fair: Simple: Simple: Simple: Unfair
Unpleasant: Simple: Simple: Pleasant
Valuable: Simple: Simple: Worthless
Weak: Simple: Simple: Strong
Fresh: Simple: Simple: Stale
Passive: Simple: Simple: Active
Tense: Simple: Simple: Relaxed
Stable: Simple: Simple: Changeable
STUDENT SELF-DIRECTION

Simple: __: __: __: __: __: __: __: __: Complex
Idealistic: __: __: __: __: __: __: __: __: Realistic
Fair: __: __: __: __: __: __: __: __: Unfair
Unpleasant: __: __: __: __: __: __: __: __: Pleasant
Valuable: __: __: __: __: __: __: __: __: Worthless
Weak: __: __: __: __: __: __: __: __: Strong
Fresh: __: __: __: __: __: __: __: __: Stale
Passive: __: __: __: __: __: __: __: __: Active
Tense: __: __: __: __: __: __: __: __: Relaxed
Stable: __: __: __: __: __: __: __: __: Changeable

STUDENT SELF-APPRAISAL

Simple: __: __: __: __: __: __: __: Complex
Idealistic: __: __: __: __: __: __: __: Realistic
Fair: __: __: __: __: __: __: __: Unfair
Unpleasant: __: __: __: __: __: __: __: Pleasant
Valuable: __: __: __: __: __: __: __: Worthless
Weak: __: __: __: __: __: __: __: Strong
Fresh: __: __: __: __: __: __: __: Stale
Passive: __: __: __: __: __: __: __: Active
Tense: __: __: __: __: __: __: __: Relaxed
Stable: __: __: __: __: __: __: __: Changeable
INDEPENDENT STUDY

Simple: __ __ __ __ __ __ __ __: Complex
Idealistic: __ __ __ __ __ __ __ __: Realistic
Fair: __ __ __ __ __ __ __ __: Unfair
Unpleasant: __ __ __ __ __ __ __ __: Pleasant
Valuable: __ __ __ __ __ __ __ __: Worthless
Weak: __ __ __ __ __ __ __ __: Strong
Fresh: __ __ __ __ __ __ __ __: Stale
Passive: __ __ __ __ __ __ __ __: Active
Tense: __ __ __ __ __ __ __ __: Relaxed
Stable: __ __ __ __ __ __ __ __: Changeable

PROGRAMED LEARNING

Simple: __ __ __ __ __ __ __ __: Complex
Idealistic: __ __ __ __ __ __ __ __: Realistic
Fair: __ __ __ __ __ __ __ __: Unfair
Unpleasant: __ __ __ __ __ __ __ __: Pleasant
Valuable: __ __ __ __ __ __ __ __: Worthless
Weak: __ __ __ __ __ __ __ __: Strong
Fresh: __ __ __ __ __ __ __ __: Stale
Passive: __ __ __ __ __ __ __ __: Active
Tense: __ __ __ __ __ __ __ __: Relaxed
Stable: __ __ __ __ __ __ __ __: Changeable
### SMALL COOPERATIVE PLANNING GROUPS

<table>
<thead>
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<td>Tense</td>
<td>Relaxed</td>
</tr>
<tr>
<td>Stable</td>
<td>Changeable</td>
</tr>
</tbody>
</table>

### GROUP INTERACTION

<table>
<thead>
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<td>Fair</td>
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<tr>
<td>Unpleasant</td>
<td>Pleasant</td>
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<tr>
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<td>Relaxed</td>
</tr>
<tr>
<td>Stable</td>
<td>Changeable</td>
</tr>
</tbody>
</table>
SOCIAL RELATIONSHIP LEARNINGS

Simple: ___: ___: ___: ___: ___: ___: ___: ___: Complex
Idealistic: ___: ___: ___: ___: ___: ___: ___: ___: Realistic
Fair: ___: ___: ___: ___: ___: ___: ___: ___: Unfair
Unpleasant: ___: ___: ___: ___: ___: ___: ___: ___: Pleasant
Valuable: ___: ___: ___: ___: ___: ___: ___: ___: Worthless
Weak: ___: ___: ___: ___: ___: ___: ___: ___: Strong
Fresh: ___: ___: ___: ___: ___: ___: ___: ___: Stale
Passive: ___: ___: ___: ___: ___: ___: ___: ___: Active
Tense: ___: ___: ___: ___: ___: ___: ___: ___: Relaxed
Stable: ___: ___: ___: ___: ___: ___: ___: ___: Changeable

GUIDANCE

Simple: ___: ___: ___: ___: ___: ___: ___: ___: Complex
Idealistic: ___: ___: ___: ___: ___: ___: ___: ___: Realistic
Fair: ___: ___: ___: ___: ___: ___: ___: ___: Unfair
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Passive: ___: ___: ___: ___: ___: ___: ___: ___: Active
Tense: ___: ___: ___: ___: ___: ___: ___: ___: Relaxed
Stable: ___: ___: ___: ___: ___: ___: ___: ___: Changeable
LARGE GROUPS (LESTURE-DEMONSTRATION)

Simple:__:__:__:__:__:__:__:__:Complex
Idealistic:__:__:__:__:__:__:__:__:Realistic
Fair:__:__:__:__:__:__:__:__:Unfair
Unpleasant:__:__:__:__:__:__:__:__:Pleasant
Valuable:__:__:__:__:__:__:__:__:Worthless
Weak:__:__:__:__:__:__:__:__:Strong
Fresh:__:__:__:__:__:__:__:__:Stale
Passive:__:__:__:__:__:__:__:__:Active
Tense:__:__:__:__:__:__:__:__:Relaxed
Stable:__:__:__:__:__:__:__:__:Changeable

SUBJECT MATTER LEARNINGS

Simple:__:__:__:__:__:__:__:__:Complex
Idealistic:__:__:__:__:__:__:__:__:Realistic
Fair:__:__:__:__:__:__:__:__:Unfair
Unpleasant:__:__:__:__:__:__:__:__:Pleasant
Valuable:__:__:__:__:__:__:__:__:Worthless
Weak:__:__:__:__:__:__:__:__:Strong
Fresh:__:__:__:__:__:__:__:__:Stale
Passive:__:__:__:__:__:__:__:__:Active
Tense:__:__:__:__:__:__:__:__:Relaxed
Stable:__:__:__:__:__:__:__:__:Changeable
AUDIO-VISUAL MATERIALS


INNOVATIONS IN EDUCATION

UNIFIED LEARNING EXPERIENCES

Simple: __: __: __: __: __: __: __: __: __: Complex
Idealistic: __: __: __: __: __: __: __: __: __: Realistic
Fair: __: __: __: __: __: __: __: __: __: Unfair
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Fresh: __: __: __: __: __: __: __: __: __: Stale
Passive: __: __: __: __: __: __: __: __: __: Active
Tense: __: __: __: __: __: __: __: __: __: Relaxed
Stable: __: __: __: __: __: __: __: __: __: Changeable

EVALUATION

Simple: __: __: __: __: __: __: __: __: __: Complex
Idealistic: __: __: __: __: __: __: __: __: __: Realistic
Fair: __: __: __: __: __: __: __: __: __: Unfair
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Stable: __: __: __: __: __: __: __: __: __: Changeable
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