

AN ABSTRACT OF THE THESIS OF

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Title: A Comparative Analysis of Three Approaches to In-service
Education Designed to Change the Behavior of Classroom

Teachers in the Social Studies (K-12)

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Dr. Jack Hall _____

Purpose of the Study

The purpose of this study was to determine the effectiveness of an in-service project for teachers of the social studies (K-12). The project was sponsored by the Region II Committee of the Oregon Council for Curriculum and Instruction (O. C. C. I.) during the period from November 1, 1966 to April 1, 1969.

Teachers from three grade levels of the project (K-12) were unavailable, therefore only ten grade levels were represented in the study. Ten teachers from each of the three project teacher groups were selected from the ten grade levels. Ten non-project teachers were identified as a control group using the project's selection procedure.

The Flanders Interaction Analysis System was used to observe the verbal behavior of the forty teachers included in the study. The ten categories of the system are: accepting feelings, praise and encouragement, accepting ideas, asking questions, lecturing, direction-giving, criticism, predictable responses, student-initiated talk, and silence or confusion. Differences in the ten categories of the Flanders system were then statistically analyzed between the project groups and the control group. Differences were also measured between project groups. The chi-square test of differences was used for statistical analysis.

Findings

Project teachers showed a statistically significant difference in the amounts of direct and indirect influence exercised in their classrooms as compared to the control teachers. Control teachers utilized much more time in their classrooms for lecture, more time for giving directions, and equivalent time for criticism as compared to project teachers (direct influence). Project teachers utilized more time for praise, accepting ideas, and asking questions as compared to control teachers (indirect influence).

The category of accepting feelings (indirect influence) was not observed in the control group and used very little by project teachers. Differences could not be statistically tested. Control teachers utilized significantly more time for silence and/or confusion in their

classrooms as compared to project teachers.

The chi-square test of differences revealed very significant differences between project and control teachers in the amounts of student talk in evidence in classroom discussions. Project teachers utilized much more time for student-initiated talk and more time for student responses in their classrooms as compared to control teachers.

Recommendations

In view of the findings of this study, the writer offers the following recommendations to schools of teacher education, public schools and other groups concerned with in-service programs for teachers.

1. Experimentation should be conducted toward development of change agents (curriculum catalysts) for each school facility, capable of identifying and implementing processes of involvement for teachers leading to the use of (1) inductive methods, and (2) teaching strategies that are applicable to the objectives of the social studies.
2. Institutions involved in in-service education should explore vehicles for introducing more of the affective domain into the classroom. Numerous techniques such as the value continuum and materials on controversial issues are available for developing qualities of receiving, responding, and valuing.
3. Institutions involved in in-service education should examine further possibilities for in-service curricular projects that

include vertical representation of teachers from all grade levels (K-12). This experience can be especially valuable for a teacher to understand cognitive expectations of students on all grade levels in the various disciplines.

4. Further research is needed to determine the effects of social studies projects upon the verbal behavior of teachers in terms of the impact of each of the variables (in-service experiences) introduced in the projects.

A Comparative Analysis of Three Approaches to In-service
Education Designed to Change the Behavior of Classroom
Teachers in the Social Studies (K-12)

by

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A COMPARATIVE ANALYSIS OF THREE APPROACHES TO
IN-SERVICE EDUCATION DESIGNED TO CHANGE
THE BEHAVIOR OF CLASSROOM TEACHERS
IN THE SOCIAL STUDIES (K-12)

I. INTRODUCTION

The writer has been involved in numerous curriculum activities that led to the present study. Experiences included (1) state-wide curriculum projects, (2) regional testing programs, (3) vocational proposals and studies, (4) special education programs, and (5) professional service including a five-year term on the state educational policies commission.

In 1965, Region II of the Oregon Council for Curriculum and Instruction (referred to in this study as the O. C. C. I.), appointed the writer chairman of a subcommittee to design a teacher in-service project for the improvement of instruction in the social studies. The project proposal was funded for two years by the United States Office of Education from E. S. E. A., Title III funds. The writer was appointed director of the project, which began January 1, 1967, and was completed March 31, 1969.

The project was directed toward concerns of the O. C. C. I. governing body, which included (1) social studies objectives, (2) in-service processes, (3) teaching strategies, and (4) building an understanding of conceptual approaches to learning with emphasis on inquiry.

Statement of the Problem

The O. C. C. I. social studies in-service project provided the writer with an opportunity to conduct an extensive experiment in grades kindergarten through twelve and investigate the effectiveness of those efforts. The experiment was directed toward changing the verbal behavior of experienced teachers.

Specifically, research will be done to ascertain whether three groups (A, B, C) of selected teachers of the social studies (K-12), after being subjected to three different sets of experiences will (1) use more indirect influence of verbal behavior, (2) encourage more student talk, and (3) maintain less silence or confusion in their classrooms than a selected group (D) of non-participating control teachers will demonstrate in their classrooms.

Additionally, the writer seeks to determine whether there will be differences between the project groups in the amount of direct and indirect influence of verbal behavior exercised in their classrooms. Definitions are on pages 8-11.

By using an interaction analysis system for measurement (see Appendix C), this study seeks to determine by direct classroom observation whether there are differences in verbal classroom behavior between project and control teachers. The same procedure will be followed to determine whether there are differences in verbal

classroom behavior between the project groups.

The writer proposes the following hypotheses:

1. Teachers from the project groups will exercise less direct influence on verbal behavior and more indirect influence on verbal behavior in their classrooms than control teachers will exercise in their classrooms.
2. Teachers from the project groups will utilize less time for lecture and more time for questions in their classrooms than will be utilized by control teachers in their classrooms.
3. Teachers from the project groups will utilize more time for praise and encouragement in comparison to amounts of criticism used in their classrooms than will control teachers in their classrooms.
4. Teachers from the project groups will utilize more time for accepting and using student ideas and less time giving directions in their classrooms than will control teachers in their classrooms.
5. Teachers from the project groups will utilize less time for justification of their authority in comparison to amounts of time utilized for acceptance of student feelings than will control teachers in their classrooms.
6. Teachers from the project groups will utilize more time for student-initiated talk in comparison to predictable responses

in their classrooms than will control teachers in their classrooms.

7. Teachers from the project groups will utilize less time for pauses due to silence or confusion in their classrooms than will control teachers in their classrooms.

Attempts will also be made in this study to ascertain differences in verbal classroom behavior between the project groups as indicated by the following hypotheses:

8. Group A teachers will exercise more direct influence as compared to indirect influence of verbal behavior in their classrooms than Group B teachers will exercise in their classrooms.
9. Group A teachers will exercise less direct influence as compared to indirect influence of verbal behavior in their classrooms than Group C teachers will exercise in their classrooms.
10. Group B teachers will exercise less direct influence as compared to indirect influence of verbal behavior in their classrooms than Group C teachers will exercise in their classrooms.

Significance of the Problem

The possibility that certain in-service experiences could produce extensive changes in the classroom verbal behavior of social studies teachers challenged the writer to conduct the experimentation and do the research for this study.

With financial assistance from Title III, Elementary and Secondary Act of 1965 (E. S. E. A.), a curriculum center was established in Milwaukie, Oregon by the writer in January, 1967. It was sponsored by the O. C. C. I. Region II Committee for the purpose of conducting an experiment in in-service education for teachers of the social studies.

As an initiator and director of the project experiment, the writer had observed numerous changes taking place in the classroom behavior of project teachers that, if verified, could have implications for in-service education.

Bruner (9, p. 79) anticipated need when he said, "It is certainly plain that at the very least there will have to be energy devoted to improving curricula and teaching the humanities and social sciences comparable to what is now being devoted to science and mathematics."

Later, Bruner (8, p. 83) may have identified a major trend and a possible direction for experimentation in the social studies when, in distinguishing between expository and hypothetical modes of teaching,

he stated, "One cannot describe the process in either mode with great precision of detail, but I think it is largely in the hypothetical mode which characterizes the teaching that encourages discovery."

Still later, Fenton (10, p. 2) added a shock of reality when he pointed out that, "Numerous surveys indicate that the status of the social studies in the secondary schools has reached a new low. Tired of memorizing long lists of facts and generalizations from textbooks, students have turned their attention to other disciplines that present more stimulating materials or a more challenging intellectual experience."

The writer (and project director) approached the challenge for classroom behavioral changes in the social studies by giving serious consideration to two of the alternatives for action. They were, (1) the preparation of social studies content material as a vehicle for instituting change, and (2) concentrating on the processes of the social studies. Available information on projects provided by Michaelis and others (23, pp. 275-305) indicated a seeming plethora of projects that were content-oriented. The decision was therefore made to embark upon an inductive process-oriented project.

Once started upon this course of action, further and more specific needs became apparent. The increasing pace of the explosion of knowledge was contributing to more and more teacher frustrations because, as Bruner (8, p. 121) stated, "One cannot 'cover' any subject

in full, not even in a life-time, if coverage means visiting all the facts and events and morsels. "

It was felt by the writer that an overwhelming majority of social studies teachers in the region could be likened to the description by Womack (33, p. 139), "When he (a principal) enters the social studies classroom, he finds the students being exposed to facts, details and content. Rarely does he expect to find a principle or generalization being evolved or a particular skill being introduced or refined, and rarely is he disappointed in his expectation. . . . It is what they are not doing but should be doing which merits and receives attention here." Morse and McCune (25, p. 2) elaborated on the position.

Tyler (32, pp. 2-6), in his four reasons for the inadequacy of social studies called for better preparation and assignment of teachers in the field, blaming "the present sorry condition of the social studies" in part on mis-assignments of teachers and inadequate preparation of teachers. He blamed a general attitude among the profession and the public as a major contributing factor to those delinquencies. To improve the situation, he emphasized the need for selecting "consistent, central purposes," consulting serious scholars and scientists actively involved in the subject for an understanding of what the subject is, giving each discipline the opportunity to "contribute to understanding through inquiry. "

The decision by the writer to accept the challenge of changing

classroom behavior of teachers of the social studies was further supported by Jarolimek (18, p. V) in his comparisons with the importance of organizational structure ". . . what is more important than the organizational structure is the quality of the learning experiences the pupils are having. "

Evidence supporting the contention that the behavior of teachers, especially verbal behavior, in the classroom is critical was stated by Amidon and Hough (3, p. 118). They pointed out that, "Teaching is more than talking, but visits to a randomly selected number of classrooms will confirm the fact that the predominant instructional behavior of the teacher is talk. Indeed, almost 70% of classroom instructional time is spent in talk by either the teacher or the students. "

The problem was further defined by one of our educational institutions (4, p. 160). The Association for Supervision and Curriculum Development decided that one of the major barriers to release of student potential is closed interaction between the teacher and learner.

Definition of Terms

For the purpose of this study, certain terms have been interpreted as follows:

1. Affective Domain: Affective domain refers to educational objectives which emphasize a feeling tone, an emotion, or a

degree of acceptance or rejection.

2. Cell: A cell is a compartment of a double-entry table, formed by the intersection of a column and a row.
3. Classroom Climate: Classroom climate refers to all environmental conditions or qualities that contribute to the nature of classroom activities.
4. Cognitive Domain: Cognitive domain refers to educational objectives which deal with the recall or recognition of knowledge and the development of intellectual abilities and skills.
5. Conceptual Thinking: Conceptual thinking refers to the process of thinking in which abstract concepts are related without reference to concrete situations.
6. Deductive Method: Deductive method refers to the method of study, research, or argument in which specific applications or conclusions are derived from assumed or established general principles.
7. Direct Influence: Direct influence refers to three observation categories of the Flanders Interaction Analysis System: (1) lecturing, (2) giving directions, and (3) criticizing or justifying authority.
8. Discipline: Discipline refers to a branch of knowledge.
9. Generalization: Generalization refers to the process of

forming a general conclusion applicable to a class of data or a total situation on the basis of a number of specific instances, or the statement of a general conclusion so formed.

10. In-depth Experiences: In-depth experiences refer to the experiences of the last half of the O. C. C. I. Region II Project for each group, an intensive focus on a workshop planned by group members.
11. Indirect Influence: Indirect influence refers to the first four observation categories of the Flanders Interaction Analysis System: (1) accepting feelings, (2) praising or encouraging, (3) accepting ideas, and (4) asking questions.
12. Inductive Reasoning: Inductive reasoning refers to reasoning that proceeds from known data to a generalization, such as a theory or hypothesis that will explain the evidence at hand.
13. Inquiry: Inquiry refers to the process of testing and developing new ideas in an open classroom climate wherein acquiring is secondary to the act of inquiring.
14. Interdisciplinary: Interdisciplinary refers to the integration of two or more of the disciplines in the social studies.
15. Module: Module refers to a unique plan for teaching a specific concept or generalization.
16. Matrix: Matrix refers to a rectangular, squared form used to register tallies categorically from classroom observations,

and the form used for transferring tallies for tabulation purposes.

17. Orientation Experiences: Orientation experiences refer to the first half of the O. C. C. I. Region II Project experience for each project group.
18. Social Studies: Social Studies refer to that part of the historical, social and behavioral sciences which are regarded as suitable for study, whether integrated or not, and of which both the subject matter and the aims are predominantly social.
19. Teaching Strategies: Teaching strategies refer to an overall plan for teaching a given idea.
20. Value: Value refers to any characteristic deemed important because of psychological, social, moral, or aesthetic considerations.

Limitations of this Study

This study is an evaluation and interpretation of an experience in in-service education for teachers of the social studies. It is limited to observed verbal behavior in the classrooms of selected O. C. C. I. Region II project teachers as compared to the verbal behavior of teachers within a selected control group.

The project was limited to three, selected small groups of teachers (14, 17, 15), who, in the opinion of their superiors were good,

traditional teachers. A control group of ten teachers was established for the study. It was selected in the same manner the project teachers were selected for the project, with the exception of randomization.

The control teachers are randomly selected. The thirty project teachers included in the study are randomly selected whenever choices are possible, totaling fourteen instances.

The primary data is limited to two classroom visitations per teacher using an interaction analysis system (Appendix C). Observation periods average twenty minutes per visitation. A total of eight hundred readings per teacher is a maximum objective for data collection in the study. A maximum 32,000 tallies is possible for the study.

This study is dependent upon the validity, reliability, and appropriateness of the control process (Scott's Coefficient) used for observer consistency. The quality of the data is dependent upon the skill used (pp. 38, 39) in applying the system and application of the control process for observer consistency that is a part of the system of analysis employed.

Due to the lack of sufficient evidence in the control and project groups of the verbal behavior entitled "acceptance of feelings," hypothesis number five could not be tested.

Although other behaviors were studied in the project, only

verbal behaviors are included in the study.

Chapter II reviews literature related to the study.

II. REVIEW OF RELATED LITERATURE

The review of literature in this chapter is organized into four sections. The purpose of Chapter II is to provide a rationale for the verbal classroom climate of the social studies experience. The literature is related to social studies in-service education, teacher preparation and conceptual approaches to teaching the social studies.

The first section is concerned with the aims of instruction in the social studies. It examines (1) the judgment of selected writers and theorists in the fields of education and psychology, and (2) the implications for objectives and teaching strategies arising from the aims of instruction in the field of social studies.

The second section is concerned with the influence of teacher preparation and in-service programs in the field of social studies. It attempts to reflect significant general concerns of leaders in education and psychology for certain situations of the classroom climate as compared to desired attributes. This section further attempts to establish the importance of one phase of classroom activity, the verbal climate, and its relationship to the total classroom climate.

The third section is concerned with the verbal climate in the social studies classroom. It is an examination of what is considered to be accepted and non-accepted affective and cognitive teacher influences in the social studies classroom, with primary consideration of verbal

activities. Opinions reviewed are those of leaders in the fields of education and psychology.

The fourth section reviews systems of observation for the classroom. It treats the questions of availability, potentiality, and limitations of observation systems that are adaptable for use in the observation of verbal behaviors in the classrooms of social studies teachers.

The Aims of Instruction in the Social Studies

If a continuum were drawn for the theories of learning and instruction, at one end we could place the process-oriented theories and at the other end the content-oriented theories. Many interpretations have been placed on these theories. The ultimate aim of the content-oriented theorist is the acquisition of knowledge. Process-oriented theorists have emphasized the importance of learning how to learn. In order to evaluate current thinking, the writer examined the continuum between those two polarities.

A broad assumption was made by Womack (33, p. 111) that the purpose of instruction is to engage in activities directed toward inducing learning. According to Womack there is and should be a trend away from grade allocation of subject matter and mastery of unrelated content. He posited a focus on teaching methods that provide for student discovery of the principles and generalizations of the social studies. Goodlad (26, p. 146) supported Womack's contention by

pointing out there is little evidence to support the practice of grade placement of subject matter.

The acquisition of knowledge as an end unto itself with the attendant teaching methods has been a target of many leaders in the fields of education and psychology (28, p. 2). The explosion of knowledge has added fuel to this attack (20, p. 19). This is due in part to the increasing difficulty experienced by teachers in covering the subject matter of the social studies (29, p. 24).

Bloom and associates (7, p. 34) believe that the teaching and evaluation of knowledge is relatively simple. They believe that those educational activities are often over-emphasized as an objective. Raths and others (27, p. 20) added another dimension to those beliefs by maintaining that reasons for the trend toward teaching facts is rooted in the rapidly increasing number of public controversies and the tendency for school people to avoid controversy. They feel that the development of moral, ethical, and aesthetic values within the school climate is either avoided or abandoned.

Bruner (8, p. 88) believes that certain teaching methods applied as a result of the thinking derived from certain stimulus-response theories have developed rote abilities in children. He pointed toward pupil tendencies to feed back information to the teacher by developing a skill in seeking cues and conforming to the wishes of the teacher. The student is then rewarded by grades or other extrinsic devices. In

contrast, Bruner would have us consider the intrinsic rewards of self-discovery through use of the modes of inquiry of the discipline being studied.

Somewhere on the continuum there is room for a rationale that combines the beliefs of process and content-oriented theorists (21, p. 120). To achieve this, a major activity developed, that of emphasis on the utilization of teaching strategies appropriate to social studies objectives (10, p. 29; 19, p. 36; 31, p. 1).

Fraser and McCutchen (16, p. 3) believe that the aims of the social studies are (1) desirable social, civic, and personal behavior, (2) emphasis on rational thought in the consideration of the problems of society, and (3) the acquisition of knowledge and skills basic to rational thinking.

If the broad aims of instruction are to induce learning, and, if they are clearly expressed in terms of objectives, Fenton (10, p. 28) posits that such objectives imply the use of teaching strategies. He believes they should vary according to the type of objective. This direct implication for instructional practices in the classroom leads next to the examination of kinds of teacher preparation and in-service programs that have contributed to those practices.

The Influence of Teacher Preparation and In-service
Programs on the Social Studies

Fenton (10, p. 109) referred to college level courses as lecture courses. He maintains there is a lack of effort toward isolating the major concepts of the disciplines taught, whether in the lower division survey courses or upper division specialized courses. He indicates that a mature student is often motivated and able to grasp abstractions, thus lecture is more justifiable in upper division and graduate classes. He states that research supports his contention. He feels that lecture is often successful if based upon extensive reading and scholarly knowledge.

If that condition prevails, it may be one explanation why many teachers in elementary and secondary classrooms tend to use a preponderance of one-way communication plus periodic reflection from the students via examinations. Bruner (8, p. 83) divides teaching into two kinds, that which takes place in the expository mode, and that which takes place in the hypothetical mode. He believes that teaching in the hypothetical mode does much more to encourage discovery.

Barzun (6, p. 24) identifies the challenge of good teaching as that of turning a pupil, a natural imitator, into a self-propelled individual. From his own experience he points out the frustrations of memory work, concluding that principles are the only things worth teaching. His rationale for teaching includes the learning of bare facts which do

not rest on principle only when they are necessary. He believes that facts resting on principle are important if the relationships between them are determined.

The problem of imitation and emulation of the college experience is considered extensive with elementary and secondary social studies teachers. The question of possible solutions is raised. Molnar (24, p. 145) posits that history teaches us that periodically the teaching enterprise is forced to leave the institutions it has founded and establish new institutions. Other critics are willing to examine alternatives for change within existing institutions.

The verbal behavior of teachers in the classroom is heavily influenced by their past experiences, especially during their periods of formal education. If that behavior is to be changed to include an in-depth utilization of more teaching strategies, the implications for teacher preparation and in-service education are important (5, p. 81). If a conceptual approach to teaching the social studies is to be used in the classroom, Mallen (22, p. 10) insists that it has to extend beyond the treatment of fact or descriptive concepts to include process concepts. He explains the reason is to provide the skills of concept transfer to the student, and maintains it is a valuable tool.

A number of terms about learning are used interchangeably by theorists, but whether they refer to the process of learning as discovery, inquiry or the conceptual approach, the concerns are similar.

Mallen (22, p. 8) posits that most teachers of the social studies are aware of the need to relate skills and concepts but their resistance is due to failure to translate theory into practice.

Fenton (10, p. 109) suggests that many students pass through college without ever seeing an audio-visual aid, a program or a simulation. Added to his list are experiences of role play, creative drama, games and the application of teaching strategies involving categories of questioning. Not all the experiences named are applicable to all learning situations, but they are desirable as a rich pool of resource tools for the teacher of the social studies.

Fenton (10, p. 110) also believes that the implications of undergraduate courses in the social studies and in general education are dysfunctional for teachers of the social studies. He calls for corrective measures such as (1) a decreasing emphasis on expository techniques, (2) fitting teaching strategies to objectives, (3) using a systems approach involving many audio-visual aids as opposed to primary reliance on a single textbook, and (4) a variety of discussion as opposed to lecture.

Another position taken by Fenton (10, p. 111) is that the teacher needs to know the psychological principles underlying teaching strategies. Fenton (10, p. 113) sees the lecture-oriented college professor, the traditionalist cooperating teacher, and the self-contained classroom as major obstacles to change. He considers the cooperating

teacher a traditionalist who emphasizes recitation, lecture, content objectives, and expository textbooks.

Fenton (10, p. 112) describes the absence in social studies programs of discussions of (1) structure, (2) concepts, (3) modes of inquiry, (4) resolution of value conflicts, and (5) relationships between objectives and methods. Fox and others (15, p. 9) support an argument for building those relationships.

In the past, the preparation of teachers and classroom emphasis in the social studies has been primarily limited to history (17, p. 136). The importance of sociology, political science, anthropology, geography, economics and social psychology to the contemporary scene is reflected in recent curriculum programs (16, p. 5). Fenton (10, p. 107) suggests that the future high school teacher receive a third to a fourth of undergraduate work in carefully planned courses from all the disciplines via a conceptual approach taught by inquiry.

The preparation of elementary teachers has been much more limited in the social studies than the preparation of high school teachers, since many elementary teachers teach all subjects. Fenton (10, p. 107) suggests the use of specialist teachers working as a team in order to obtain a sufficient cognitive background in the disciplines to grasp the conceptual approach and communicate it to others. This requires careful counseling of future teachers. A single discipline taught in depth thus provides the desired membership on the team.

A synthesizing course entitled "Structure of the Social Studies" is suggested by Fenton (10, p. 109) for the college senior year. He advocates directed classroom discussion in order to provide a model for future teaching.

In-service programs are still restricted in many school systems to an institute day which is often limited to an exercise in telling and at best an inspirational effort (10, p. 116). Pre-school and in-school workshops are frequently held but are often criticized for their limitations and repetition of current practices. Where in-service programs are concerned, Fenton (10, p. 116) suggests that an individual school or school system concentrate on an in-depth program conducted throughout the year. He advocates a focus on discussions and demonstrations of new materials from projects and publishers. More specifically, he suggests the introduction of an experimental unit from a project, trying it in the classroom with intermittent professional discussions and following up with evaluation.

Extension courses in the graduate programs of the universities and colleges provide classes that are concerned with teaching strategies. Although very important, Fenton (10, p. 117) maintains that the new social studies materials and methods needed to use them are lacking in most of their classrooms.

Federally funded institutes held in the summer time and, in some instances, during the school year, are credited (10, p. 117) with many

contributions to the social studies. However, by following the experiences of a typical teacher in those programs, gross inadequacies are revealed. Fenton says that the Experienced Teacher Fellowship Program of the United States Office of Education offers the best opportunities for developing leadership for change. He advocates expansion of the program.

The Verbal Climate in the Social Studies Classroom

Research by Flanders (3, p. 188) indicates that in the average classroom verbal activity consumes two-thirds of the time and that the teacher talks two-thirds of the time used in verbal activity. He also found that two-thirds of the teacher talk in the average classroom is direct (lecture, criticism, direction-giving).

The above research relates pupil achievement to teacher verbal behavior patterns in a large scale study and the results indicate that verbal behavior patterns of superior teachers can be identified and that they differ significantly from those of other teachers.

Further results from the Flanders research indicate that teachers of low-achieving groups talk approximately 80% of the time, while teachers from high-achieving groups talk approximately 55% of the time. Similarly, teachers of low-achievers used direct influence approximately 80% of the time compared to 50% for teachers of high-achievers.

Amidon and Giammatteo (3, p. 187) conducted similar research

with elementary teachers using the Flanders system. The results indicated that the verbal behavior patterns of superior teachers (as chosen by administrators and supervisors) did differ substantially from those of average teachers. The talk time of superior teachers approximated 40% of the total class time compared to 52% for average teachers. Superior teachers were more receptive of student-initiated ideas, more indirect in their behavior, less dominative, and used fewer directions and criticism. Questions from superior teachers were of a broader nature and they were interrupted more frequently by student questions. Superior teachers experienced about 12% more student participation.

Using a modification of the Flanders system, Pankratz (3, p. 189) conducted similar research to the above with high school physics teachers. Two groups of teachers were rated, one a high group, one a low group, using (1) ratings of their principal, (2) student opinion, and (3) a teaching situation reaction test. The five highest (of thirty) and the five lowest teachers of that group were chosen for the research. Observer reliability was established and maintained by using the Scott formula (12, p. 10).

Statistical analysis for the Pankratz study included the t-test to compare percentages of time the high and low samples spent in each category and a chi-square test was used for comparison of the total interaction pattern between the two groups.

An acceptable level of significance for differences between the

groups was reached by Pankratz in five categories of the system, (1) praise, (2) clarification, (3) commands, (4) criticism, and (5) confusion. There was no significant difference between the direct and indirect groups of categories, but the revised direct/indirect ratio was significantly different by a ratio of 9 to 1. The ratio of direct influence to student talk was not significant. Teachers in the high sample used significantly more extended clarification and extended answers to student questions. The total interaction pattern was significantly different between the two groups.

The results of the Pankratz study (3, p. 205) are supported by the research of Flanders (11, 13) and of Amidon and Giammatteo (2). The purpose of referring to the various research studies was to (1) examine research on both the elementary and secondary levels, (2) compare the results of related research, and (3) develop a rationale that the verbal behavior patterns of a select group of teachers can be identified by their superiors and that the behaviors differ significantly from behaviors of other teachers.

Systems of Observation for the Classroom

Among the more widely known systems devised for observation of the classroom climate are those developed by Withall, H. H. Anderson, Lewin, Lippitt, White, Bales and Strodtbeck, Amidon and Hunter, Fox, Schmuck, and Luszki, and the Flanders System of

Interaction Analysis.

The system of interaction analysis developed by Flanders was chosen for use in the study for the following reasons:

1. It is comparatively simple, with enough categories (12, p. 5) to be comprehensive, but few enough to memorize readily.
2. It has been widely used for approximately ten years for research and teacher preparation, and was considered one of the most valuable research tools by leaders in the fields of social studies and psychology (3, p. 125; 10, p. 55; 15, p. 58; 1, pp. 1-18).
3. It is readily adaptable to modification of categories if needed for re-directing its purposes toward different objectives.
4. It has a system for training observers. The system establishes and periodically re-establishes observer reliability on a standardized scale with a required minimum level of performance.

By comparison, most systems are lacking in one or more of the needed characteristics. The system by Amidon and Hunter is an adaptation of the Flanders system using several more categories, which, although more definitive, may have presented memorization problems to the observer which in turn could negate the desired comprehensiveness.

Summary

This chapter indicates that contemporary research, the explosion of knowledge, and the influence of current theorists in education and psychology have major implications for change in the fields of social studies teacher preparation and in-service education in the social studies.

The objectives in the social studies are veering away from the acquisition of unrelated knowledge toward a conceptual approach to learning with emphasis on the use of inquiry, and with direct implications for teaching strategies. Limited attention in the past toward disciplines other than history is giving way to an interdisciplinary and multidisciplinary emphasis on all the disciplines in the social studies.

Additions to the pool of teaching strategies which are needed for application to the objectives of the social studies require changes in the existing teacher preparation and in-service education programs.

Research indicates that a large part of classroom time is devoted to some kind of talk and that teachers monopolize a major portion of that time. Research also indicates that the verbal behavior patterns of selected teachers considered to be superior by their administrators proved to be significantly different from the verbal behavior patterns of other teachers. Numerous research studies have utilized the Flanders Interaction Analysis System to ascertain those differences.

A comparable study of several groups of teachers (K-12) who, in the estimation of their superiors were good, traditional teachers, should exhibit significant differences in verbal classroom behaviors if the objectives of their in-service experiences were achieved. Comparison with a control group selected similarly from the same population of good, traditional teachers should reveal the behavior differences.

Chapter III describes the design of the research study which investigates the effectiveness of an in-service project in the social studies.

III. DESIGN OF THE PROJECT AND THE STUDY

The regional project directed by the writer differed from other teacher in-service projects of the social studies reported in the literature in at least six ways:

1. It was process-oriented toward conceptual approaches to learning using inquiry.
2. It was inductive in that the participants determined project objectives by examining the alternatives.
3. The roles of and relationships between the disciplines of the social studies were investigated with leaders from each of the disciplines.
4. Every known teaching strategy was studied in terms of application to general and specific objectives with emphasis on behavioral objectives.
5. Emphasis was given to two-way communication in the classroom extending to categories of thinking beyond recall, with special attention to categories of questioning.
6. Various social studies curricular experiences were chosen by the project participants for their in-depth intensive workshops.

Project Locale

The project took place in Region II of the Oregon Council for Curriculum and Instruction, referred to in this study as the O. C. C. I. Region II is comprised of four counties: Clackamas, Columbia, Multnomah, and Washington. This area includes the city of Portland, it's suburbs, and rural areas in each county. During the period of the project, from ninety to one hundred school districts existed in Region II, a number which slowly decreased as Union High School Districts were unified under state reorganization statutes.

The principal industries of Clackamas County are lumbering, agriculture, manufacturing, and warehousing. The principal industries of Columbia County are agriculture, lumbering, mining, and fishing. The principal industries of Multnomah County are manufacturing, lumbering, and transportation. The principal industries of Washington County are agriculture, lumbering, manufacturing, food processing, and electronics.

Project Procedures

The project was carried out during the period extending from November 1, 1966 to March 31, 1969 (this study was extracted from the project). Three groups of social studies teachers were involved in the project in an effort to improve instruction in their classrooms

during the period of the project. The first two groups (A, B) were selected from nominations of "good, traditional social studies teachers" made by administrators of local school districts in Region II, O. C. C. I. To select the teachers for the project, a decision was made by the writer as project director to have administrative superiors of the teachers in the various school districts in the region make the nominations. The use of this procedure is supported by the research of Robbins (3, p. 119), who found that educational superiors can with accuracy characterize the teaching patterns of their faculty. To establish the control group for the study, similar procedures were followed.

Grade levels included in the project for all three groups were kindergarten through twelfth grade. Selection of teachers for the first two groups (A, B) was based upon geographic representation, grade level representation and the degree of dissatisfaction with the existing social studies programs as expressed by nominated members. Nominations for all groups were screened by the writer as project director in cooperation with the professional committees.

The third group (C) was developed as a supplementary addition to the project. Five teacher-administrator teams were selected from five school districts representing the four counties in the region. Two teams represented Clackamas County. Each team was represented by two administrators and three "good, traditional teachers." An attempt

was made by the district superintendent of each of the five districts to choose team members from (1) curriculum directors, (2) building principals, (3) elementary teachers, (4) junior high or upper grade school teachers, and (5) senior high school teachers. This effort was accomplished with two exceptions on the administrative level. Only teachers were chosen from Group C for the study.

Experiences of the first two groups (A, B) were divided into two major time periods of twenty days each. The first major period (orientation) was made up of four phases. Phase I involved listening to the experts about the role and modes of inquiry of each discipline in the social studies. They were representatives from each discipline drawn from local, regional, and national sources. Their responsibility was to examine with project teachers the unique role of their discipline and the concepts of the discipline that are related to the concepts of other disciplines. Modes of inquiry were also examined.

Phase II gave project teachers the opportunity to listen to the views of neighboring school districts about experimental projects in their schools. Representatives from school districts who were developing new social studies programs were invited to group sessions to review their experiences with their experiments. Eugene, Portland, Lake Oswego, and Beaverton were among those who reported their experiences in the social studies.

Phase III involved critical self-analysis of classroom behavior.

Various techniques, including typescripts (Appendix A), video-tapes, audio-tapes, simulation, games, and role playing were studied and applied to classroom activities of each teacher. Selected results were reviewed in small groups and the entire group, assisted by two general consultants in the field of social studies. Informal sensitivity activities were interwoven into this phase of the project.

All of the first three phases were begun in the order mentioned and conducted concurrently. Phase IV, which began during the last half of the orientation period, involved planning sessions wherein the teachers were a major factor in the decision-making for the second period of the project, a four-week in-depth workshop.

The first group (A) chose as the vehicle for in-depth workshop experiences a study of urbanization. As a result of the experience a teaching model of urbanization was developed, tried out during the period from September to December 31, 1967, and then used for classroom demonstrations by Group A teachers.

In developing the model of urbanization, Group A members first agreed upon and then defined a list of terms as a common frame of reference. They then chose a major concept from each discipline of the social studies that could, and perhaps should be, taught on each of the grade levels (K-12). Utilizing small-group and large-group organization, both vertical and horizontal, they developed sets of generalizations of increasing depth from kindergarten through the

twelfth grade.

Modules were then produced for experimentation in the classroom. After January 1, 1968, follow up sessions were held regularly to refine and perfect instructional practices in the social studies introduced in the experiment.

The second group of the project (B) chose as a vehicle for the in-depth summer workshop a curriculum analysis of a selected new project and/or newly published materials in the social studies. They utilized an instrument developed by the Social Science Consortium located in Boulder, Colorado. Representatives of the Consortium assisted with initial orientation experiences and with follow up evaluation activities. The group divided into five sub-groups consisting of K-1, 2-3, 4-5-6, 7-8-9, and 10-11-12 grade level representation.

The Consortium instrument was first revised extensively to supply additional information for working purposes that the group felt was needed. The groups averaged completion of two analyses each, and, in addition, two groups developed their own simplified revisions of the instrument. Their efforts were later made available for public purchase by the Consortium.

Orientation experiences were much more limited for Group C since that group was an addition not originally planned and introduced during the last year of the project. The orientation period, April 1, 1968, to June 10, 1968, included extensive planning sessions for the

Group C experiences involving the five team leaders, the general consultants for the project, and the project director. Six days of intensive activity were scheduled within the orientation period, plus voluntary inclusion in the activities of Groups A and B. In-depth activities were planned by each team during the orientation period, then the complete responsibility for execution of the plans was left to the sponsoring school districts.

Group C was extended the privileges of using project materials and consultant services and attending Group A and B follow up and in-depth sessions. One district developed a set of idea books (K-6) for the social studies, serving as a vehicle for in-depth experiences. One district developed a guide for the social studies (K-12) during their in-depth experience. The remaining districts directed their efforts toward new program development and teacher improvement in the social studies. Much of this effort continued through the following school year and was intended to be on-going.

Equivalence of Groups

In preparing for the study, the control and experimental groups were equated by using the following procedures:

- (1) Administrators from O. C. C. I. Region II were asked to nominate "good, traditional" teachers.

- (2) Horizontal comparisons within grade levels were included in the project. A governing factor for the study was the availability of those teachers for classroom observation.
- (3) Teachers were selected from the project by lot for the study in fourteen of thirty instances. Control group selections were drawn by lot from the nominations.
- (4) Instructions given to each teacher preliminary to observation visits were exactly the same, "a discussion lesson of twenty minutes or more."

Cogan (3, p. 69) considers as one of the valid frames of reference for measuring the competence of teachers the perception of administrators. Robbins (3, p. 119) presents evidence that school principals can, with accuracy, characterize the teaching style of members of their faculty.

A study of teacher behavior by Amidon and Giammatteo (3, p. 186) was made of a group of 153 elementary teachers from 11 school districts. They asked administrators and supervisors to nominate 33 of the teachers as superior or master teachers. The study produced marked differences in the behavior of the superior or master group from that of the control group of teachers who were chosen at random.

Special efforts were made by the writer as project director and

the professional committees to obtain three independent samples for the project from the population of representative "good, traditional teachers" practicing in the O. C. C. I. Region II. The non-project control group was selected in the same manner as the project groups from the same population of teachers.

Study Procedures

Thirty teachers were selected for this study from those teachers involved in the project. It was possible to include ten of the thirteen grade levels of the project in this study. An effort was successfully made in the study to ensure that teachers were available from each of the four groups for the ten grade levels selected. An effort was also made to develop balanced representation between elementary, junior high school, and senior high school levels. Ten names of teachers for each of the three project groups were drawn by lot when possible (fourteen of thirty) for inclusion in the study.

A control group was established for comparative purposes by asking administrators to nominate teachers in the same way project teachers were nominated; then ten names were drawn by lot for the ten grade levels chosen for the study.

The classes of each of the forty teachers in the study were visited at least two times by an observer, who was trained in the use of the Flanders system and who trains teachers in it's use. The writer

accompanied the observer on approximately 25% of the visits and made independent observations, to develop understanding of the process.

At least a week elapsed between the visits to a given teacher. Previous to each visit, the teachers were asked to schedule the observer for a discussion lesson. A few additional visits were necessary due to unforeseen changes in classroom activities and due to various emergencies that arose because of the vagaries of time schedules. The writer scheduled daily visitations regionally to minimize travel requirements. The observer was unaware of teacher placement in the four groups due to random scheduling of all the groups.

The Flanders Interaction Analysis System was used for all observations made in collecting the basic data for the study. None of the teachers in the project or control group had previous experience with the Flanders system, nor was it used or referred to in the project experience. An average of twenty minutes was used for each observation period, thus accumulating an average of four hundred tallies per session for each teacher, or a total average of eight hundred tallies for each teacher. This totaled approximately thirty-two thousand tallies for the study.

In determining the reliability of the classroom observer in the study, the Scott method of calculating reliability was employed (Appendix B). This technique was selected rather than that of Bales (Appendix B) or others because Scott's Coefficient is (1) unaffected by

low frequencies, (2) can be translated into percentage figures, (3) can be estimated in the field, and (4) is more sensitive at higher levels of reliability.

One observer is used in the study instead of a team for several reasons; (1) the cost of the team approach is prohibitive and time consuming, (2) experience indicates lack of early agreement among team members and subsequent loss of data, (3) the availability of observers is limited, and (4) the scheduling problems for teams observing forty teachers in four geographically large counties is tremendous.

In calculating reliability for one observer, selected video-tapes were used. They had been taken by the project director of classroom discussions of project teachers in action at the beginning of their project experience. In this way several observations of the same verbal behavior was recorded, thus estimates of reliability were acquired.

To reduce the influence of pre-exposure in the second viewing, five selected videotapes were randomly viewed over the period of observation for the study. Three of the videotapes were viewed more than once. In estimating reliability, it was found that Pi (Scott's Coefficient) was above .90 and approached .95. This level of reliability was well within the research limits of .80+.

In addition to the use of the Scott technique, the observer used for the study has several impressive qualifications. They are:

(1) college experience in teaching interaction analysis, (2) author of a manual for the training of research observers in interaction analysis, (3) experience that included observations in over 500 classrooms using interaction analysis, and (4) the development of training materials for teaching interaction analysis (seven classroom films with coded scripts). The observer's estimate of reliability in the use of the scripts and films exceeded the .90 level.

The procedure used with the Scott technique is described in detail in Appendix B. The observations for the study were made within a period of slightly more than two months extending from April to June, 1969.

Hereafter, in this study, indirect influence refers to the first four categories of the Flanders system; accepts feelings, praise and encouragement, accepts ideas, and questioning. Direct influence refers to the next three categories; lecture, direction giving, and authority justification. Student talk refers to predictable responses and initiated talk.

Description of Recording Instruments and their Uses in this Study

The tabulation matrix is a form used to record observations of verbal behavior in the classrooms of the project and control teachers included in the study. A copy is in Appendix B. The form is entitled

"Content Analysis Worksheet" and is designed for a maximum of 400 observations within a twenty-minute period of observation.

The interpretation matrix is a form used to categorize the observations from the tabulation matrix for the study. A copy of the form is in Appendix B. The form is entitled "Content Analysis Matrix" and consists of a grid with fourteen rows and twelve columns. The ten categories of the Flanders system are provided for in the form. There is also a provision for totals and percentages in the form.

Description of Testing Instruments and their Uses in this Study

In order to interpret data for the study, the statistics are tabulated into contingency tables and analyzed by applying the chi-square test. A brief description of the instruments and their use in this study follows.

Contingency tables (30, p. 238) are used for comparing amounts of verbal behavior demonstrated by project teachers categorically with the non-project control teachers. The writer determines the effectiveness of the project by measuring and comparing amounts of verbal behavior demonstrated in actual classroom discussions. Multiple classification is required for making horizontal comparisons between categories of the Flanders system. The 2 x 2 and 2 x C contingency tables developed for the statistical analysis from interpretation

matrices for this study are presented in Appendix D.

The chi-square test is the instrument chosen for the statistical analysis because; (1) the statistics are non-parametric, (2) a normality assumption cannot be satisfied, and (3) it is a technique for measuring suspected relationships. To determine the truth of the null hypotheses, the significance of comparative amounts of verbal behavior must be determined.

The chi-square test is applied to the ratios of the independent samples (observations of verbal classroom behavior) taken within the classrooms of the teachers of the four groups involved in the study. The chi-square test is also applied to the ratios of the samples of the various categories of verbal behavior observed while using the interaction analysis system.

Since the measurement of sampling is the observation tally, an interval of three seconds, the relative sizes of the samples used are indicated by the number of observations (800) averaged for each teacher and the number of observations (8000) averaged for each of the four groups. Comparisons are made using the chi-square test collectively and individually between the experimental and control groups to determine if any statistical difference in amounts of demonstrated verbal behavior existed.

The .01 level of significance is selected by the writer for the study. The type of in-service activities provided for social studies

teachers is considered critical to the challenge of changing verbal behavior in the classroom.

Summary

This chapter identifies the geographical setting in which the project took place, the uniqueness of the project, and the procedures used in conducting the experiment in social studies in-service education. The details of how the study was organized are described, and the recording and testing instruments and their particular uses in investigating the hypotheses of the study are described. Chapter IV presents the findings of the data collected with these instruments.

IV. PRESENTATION OF THE DATA

This study is conducted for the purpose of investigating the effectiveness of a teacher in-service program in the social studies. It specifically seeks to determine whether teachers from the project groups, as a result of the experiment, would demonstrate significantly different verbal behavior in their classroom as compared to a control group. Differences in verbal behavior between project groups are also investigated.

The Data for Hypotheses One through Seven

Hypotheses one through seven in this study are concerned with the verbal behavior of thirty teachers in the classrooms of project teachers as compared to the verbal behavior of ten teachers in the classrooms of control group teachers. Chi-square tests were applied to the results obtained from observations taken in the classrooms of the forty teachers included in the study. The results of this comparative analysis are as follows:

Hypothesis Number One

Teachers from the project groups exercised at the .01 level significantly less direct influence and significantly more indirect influence in their classrooms than exercised by control teachers in

their classrooms. The chi-square test of differences, shown in contingency Table 8 of Appendix D, indicates that differences in direct and indirect influence used between the groups are statistically very significant. Table 7 of Appendix D reveals that the three project groups considered as one group averaged more classroom time (159 tallies) using indirect influence, and averaged much less classroom time (1748 tallies) using direct influence than utilized by control teachers in their classrooms.

The categories of the Flanders system are shown in Table 6 of Appendix C.

These results reject the null hypothesis that significant differences between the amounts of direct and indirect influence exercised in the classroom by project teachers as compared to control teachers are due to chance. Therefore, hypothesis number one is accepted.

Hypothesis Number Two

Teachers from the project groups utilized at the .01 level significantly less time for lecture and more time for questions in their classrooms than utilized by control teachers in their classrooms. The chi-square test of differences, shown in Table 10 of Appendix D, indicates that the differences between the ratios are statistically very significant. Table 9 of Appendix D reveals that project teachers

averaged much less time (1653 tallies) comparatively for lecture and more time (75 tallies) for questions than control teachers in their classrooms.

These results reject the null hypothesis that significant differences between the amounts of lecture and questioning time utilized in the classroom by project teachers as compared to control teachers are due to chance. Therefore, hypothesis number two is accepted.

Hypothesis Number Three

Teachers from the project groups utilized at the .01 level significantly more time for praise and encouragement as compared to criticism in their classrooms than control teachers utilized in their classrooms. A chi-square test of differences, shown in Table 12 of Appendix D, indicates that the differences between the ratios are statistically very significant.

Table 11 of Appendix D reveals that project teachers utilized more time comparatively for praise and encouragement (31 tallies) but virtually the same time comparatively for criticism (1 tally) as the control teachers. These two categories were utilized a very small proportion of classroom time in all four groups studied as evidenced by the small number of observation tallies.

These results reject the null hypothesis that significant differences between the amounts of praise and criticism utilized in the

classroom by project teachers as compared to control teachers are due to chance. Therefore, hypothesis number three is accepted.

Hypothesis Number Four

Teachers from the project groups utilized at the .01 level significantly more time for accepting and using student ideas and less time giving directions in their classrooms than control teachers utilized in their classrooms. A chi-square test of differences, shown in Table 14 of Appendix D, indicates that the differences between the ratios are statistically very significant.

Table 13 of Appendix D reveals that project teachers averaged comparatively more time for accepting and using ideas (50 tallies) than control teachers. The table also reveals that project teachers averaged comparatively less time for direction-giving (97 tallies) than control teachers.

These results reject the null hypothesis that significant differences between the amounts of idea-acceptance and the amounts of direction-giving utilized in the classroom by project teachers as compared to control teachers are due to chance. Therefore, hypothesis number four is accepted.

Hypothesis Number Five

Teachers from the project groups utilized more time in their classrooms for justification of their authority and more time for acceptance of student feelings than control teachers utilized in their classrooms. Table 15 of Appendix D reveals that project teachers averaged more time for category of criticism and justification of authority (1 tally) in their classrooms. However, the difference was only 1 tally or 3 seconds of time, thus the comparative times were virtually the same.

Tables 15 and 16 of Appendix D reveal that there were only seven tallies in the project groups for the category entitled acceptance of student feelings. There were no tallies made from the control group in that category.

It was impossible to analyze the statistics due to insufficient tabulations in one cell (acceptance of feelings). Therefore, hypothesis number five cannot be tested.

Hypothesis Number Six

Teachers from the project groups utilized at the .01 level significantly more time for student talk in their classrooms than control teachers utilized in their classrooms. A chi-square test of differences, shown in Table 18 of Appendix D, indicates that the differences between

the ratios of student categories are very significant statistically.

Table 17 of Appendix D reveals that project teachers averaged more time in their classrooms comparatively for both categories of student talk with a much greater difference (1428 tallies) in student-initiated talk than in predictable responses (343 tallies).

These results reject the null hypothesis that differences between the comparative amounts of student talk present in the classrooms of project teachers compared with the classrooms of control teachers are due to chance. Therefore, hypothesis number six is accepted.

Hypothesis Number Seven

Teachers from the project groups utilized at the .01 level significantly less time for pauses due to silence or confusion in their classrooms than control teachers utilized in their classrooms. A chi-square test of differences, shown in Table 20 of Appendix D, indicates that the difference is statistically very significant in the ratios of student talk and silence or confusion between the project and control groups.

Table 19 of Appendix D reveals that project teachers averaged less time in their classrooms comparatively for silence or confusion than the control teachers by a difference of 75 tallies. The table also reveals that the project teachers averaged more time in their classrooms comparatively for the two categories of student talk with a

difference of 1771 tallies.

These results reject the null hypothesis that significant differences between the comparative amounts of silence of confusion present in the classrooms of project teachers as compared to the classrooms of control teachers are due to chance. Therefore, hypothesis number seven is accepted.

The Data for Hypotheses Eight through Ten

Hypotheses eight, nine, and ten are concerned with comparisons of amounts of direct and indirect influence exercised in the classrooms of each project group in contrast with the classrooms of the other two project groups. Chi-square tests were applied to the data, comparing each group of ten teachers to the other two project groups for the two kinds of influence. The results of this comparative analysis are as follows.

Hypothesis Number Eight

Group A teachers utilized more time for direct influence as compared to indirect influence in their classrooms than Group B teachers utilized in their classrooms. A chi-square test of differences, as shown in Table 22 of Appendix D, indicates that the difference is statistically significant at the .01 level.

Table 21 of Appendix D reveals that Group A teachers utilized

more time using direct influence (188 tallies) than Group B teachers utilized in their classrooms. Group A teachers also utilized less time using indirect influence (226 tallies) than Group B teachers.

These results reject the null hypothesis that differences between the amounts of direct and indirect influence exercised by Group A teachers compared to Group B teachers are due to chance. Therefore, hypothesis number eight is accepted.

Hypothesis Number Nine

Group A teachers utilized less time for direct influence as compared to indirect influence in their classrooms than Group C teachers utilized in their classrooms. A chi-square test of differences, as shown in Table 24 of Appendix D, indicates that the difference is not statistically significant at the .01 level.

Table 23 of Appendix D reveals that Group A teachers utilized less time using direct influence (373 tallies) than Group C teachers utilized in their classrooms. Group A teachers also utilized less time exercising indirect influence (195 tallies) than Group C utilized in their classrooms.

These results accept the null hypothesis that differences between the amounts of direct and indirect influence exercised by Group A teachers as compared to the amounts utilized by Group C teachers in their classrooms are due to chance. Therefore, hypothesis number

nine is rejected.

Hypothesis Number Ten

Group B teachers utilized at the .01 level significantly less direct influence as compared to indirect influence in their classrooms than Group C teachers utilized in their classrooms. A chi-square test of differences, as shown in Table 26 of Appendix D, indicates that the difference is statistically very significant.

Table 25 of Appendix D reveals that Group B teachers utilized less time using direct influence (561 tallies) than Group C utilized in their classrooms. Group B also utilized more time using indirect influence (31 tallies) than Group C utilized in their classrooms.

These results reject the null hypothesis that significant differences between the amounts of direct and indirect influence exercised by Group B teachers as compared to Group C teachers in their classrooms are due to chance. Therefore, hypothesis number ten is accepted.

Verbal Behavior Influence Data Summary

Specifically, chi-squares of the four analyses are:

Between project and control groups (direct to indirect influence - verbal)	411.69
Between Group A and Group B (direct to indirect influence - verbal)	27.00

Between Group A and Group C (direct to indirect influence - verbal)	5.52
Between Group B and Group C (direct to indirect influence - verbal)	59.85

With one degree of freedom, the probability of differences due to factors other than chance requires a chi-square of 6.63 or greater to achieve the .01 level of significance.

Of the total classroom discussion time observed in the study, the project groups used 53% of their time for teacher talk and the control group used 70% of their time for teacher talk (Table 27, Appendix D).

Chapter Summary

In this chapter, the data and findings for this study are presented. The major purpose of this study, to determine the effectiveness of an in-service project for social studies teachers (K-12) is realized. Three groups (A, B, C) of selected social studies teachers (K-12), after being subjected to three different sets of experiences, did (1) use more indirect and less direct verbal influence than the control group, (2) encourage more student talk via predictable responses and initiated talk than the control group, and (3) maintain less silence or confusion in their classrooms than the selected group (D) of non-project control teachers demonstrated in their classrooms.

An additional purpose of this study, to determine whether there

there would be differences between the project groups in the amounts of direct and indirect verbal influence exercised in their classrooms, is also realized. Group A teachers did exercise more direct influence than Group B and Group B did exercise less direct influence than Group C and the differences are significant. Group A teachers did exercise less direct influence than Group C and the differences are not significant.

Direct influence refers to a combination of the Flanders categories of (1) accepting feelings, (2) praising or encouraging, (3) accepting ideas, and (4) asking questions. Indirect influence refers to a combination of the Flanders categories of (5) lecturing, (6) giving directions, and (7) criticizing. Student talk combines (8) predictable responses, and (9) student-initiated talk. Silence or confusion is the final category.

Hypotheses one, two, three, four, six, and seven are accepted as a result of the findings. Hypothesis five cannot be tested. Hypotheses one through seven are concerned with combined and specific categories of teacher influence, student talk, and non-activity as defined by the Flanders system.

Hypothesis nine is rejected and hypotheses eight and ten are accepted. Hypotheses eight, nine, and ten are concerned with comparisons of amounts of direct and indirect verbal influence exercised by teachers from the project groups, by comparing the groups with

each other.

Chapter V, which follows, will analyze the findings reported in Chapter IV, summarize the study, and make recommendations for further study.

V. SUMMARY, ANALYSIS OF FINDINGS, AND RECOMMENDATIONS

Summary

In recent years, numerous experiments with school curricula have resulted in revolutionary school programs referred to as the "new social studies." These experiments had far-reaching implications for teacher in-service education. The purpose of this study is to investigate the effectiveness of an in-service project in the social studies that attempted to cope with the challenge of change by attempting to change the behavior of selected teachers in the classroom.

The in-service project directed by the writer differed from in-service experiments most frequently reported in the literature in six significant ways: (1) process-orientation, (2) inductive development of objectives, (3) role examination of the disciplines, (4) association of teaching strategies with objectives, (5) categories of thinking and questioning through two-way communication, and (6) vehicles used for in-depth experiences.

Related literature presents evidence of change in in-service social studies programs for teachers to a limited degree, yet no single program or direction taken previous to this experiment appears to have major support of the leadership in the social studies field. During the past decade a large number of programs were started in the field of

social studies for curriculum development via new materials, but the challenge to translate theory into practice, to utilize the new materials effectively was a unique effort of the in-service project that this study evaluates in terms of effectiveness.

Ten hypotheses that anticipate the effectiveness of the in-service project are tested in this study. Three groups of project teachers are compared with a non-project control group. The study also compares the project groups with each other. The specific verbal behaviors observed and analyzed in the study are feelings, ideas, praise and encouragement, questioning, lecture, direction-giving, authority justification, predictable responses (student), student-initiated talk, silence or confusion, a combination of the first four entitled indirect influence, and a combination of the next three entitled direct influence.

Ten teachers were selected from each of the project groups for inclusion in the study. Three of the thirteen grade levels represented in the project are not included in the study due to unavailability of project teachers to represent all three groups on those grade levels. The control group, which did not participate in the in-service project or in similar projects, was composed of ten teachers from the same grade levels chosen for the study.

A system of interaction analysis was chosen from those available to accumulate data for the study by observing verbal behavior in the classroom. The Flanders system was chosen as the most valid and

reliable instrument because of more extensive research findings available utilizing the system. It has been used in numerous doctoral studies and other types of experimentation. It was chosen also because of the method used within the system for establishing and maintaining observer reliability.

None of the teachers in the project and control groups had previous experience with the Flanders system. It had not been used or referred to in the project. A major focus of the study was on the comparison of amounts of direct and indirect influence exercised in the classrooms of project teachers as compared to the classrooms of control teachers.

Two or more visits were made to the classroom of each teacher included in the study for a sample of slightly less than 32,000 tallies. All teachers were asked to schedule the observer into a social studies discussion lesson according to the teacher's interpretation of discussion lesson.

Of the ten hypotheses in this study, eight are accepted, one is rejected, and one cannot be tested. Hypothesis one is accepted since the project groups utilized a significantly larger amount of time for indirect influence and significantly less time for direct influence than the control group. Hypotheses two, three, four, six, and seven are accepted since the differences found between the project groups and the control group in categories two, three, four, five, six, eight, nine,

and ten of the Flanders system are significant. Hypothesis nine is rejected since the differences found between Project Groups A and C are not significant in amounts of direct and indirect influence exercised in their classrooms. Hypotheses eight and ten are accepted since differences found between Project Groups A and B and between Groups B and C are significant in amounts of direct and indirect influence exercised in their classrooms. Hypothesis five cannot be tested due to insufficient data in one cell of the Flanders system.

Analysis of Findings

Research cited in Chapter II of this study, indicating neglect of the affective domain in the social studies, is supported in the findings of this study in the category of "accepts feelings," in which the teacher accepts and clarifies the feeling tone of the students. The complete absence of this category in the control group and the very limited evidence of this category in the classrooms of the project groups supports the research that shows an overwhelming emphasis on the cognitive domain in the elementary and secondary classrooms of social studies teachers (2, p. 284).

Flavel (14, p. 81) revealed a theory advanced by Piaget that separation of affect and cognition for discussion purposes is possible but that in life they are dissociable. Very little evidence (Table 15 p. 99) was found in the class discussions observed in this study to

indicate "in life" classroom climates if such a theory is accepted.

Krathwohl and others (21, p. 18) explained the phenomenon of such findings by positing that the general concept of education is overwhelmingly restricted to cognitive activities. They maintained that teaching in the affective domain is viewed by our society as indoctrination, not education.

The findings of this study imply that the experimental project group activities significantly influenced the verbal behavior of the teachers that were included in the project in-service experiences. The verbal behavior of project teachers as compared to control teachers included significantly more time for student-initiated talk and predictable responses. The project teachers utilized significantly less time than control teachers for lecture in the classroom.

Evidence obtained from the classrooms of the experimental project groups supports the research of Flanders (3, p. 188) which reports that in the average classroom the teacher talks two-thirds of the time used in verbal activity. The percentage of total time observed utilized by the control group was 70% while the project groups utilized 53% of the total time observed.

The research of Robbins (3, p. 119), who found that educational superiors can with accuracy characterize the teaching patterns of their faculty, is supported by the findings of this study in the area of verbal behavior patterns (Table 27, Appendix D). The verbal behavior

patterns of control teachers in their classrooms compare closely to the average classroom identified by Flanders (3, p. 188).

Project teachers averaged 9% more time than control teachers exercising indirect influence (categories 1-4, accepting feelings, praise, accepting ideas, questions). Project teachers averaged 54% less time than control teachers exercising direct influence (categories 5-7, lecture, directions, criticism). Project teachers averaged 43% more student talk in their classrooms (categories 8-9, predictable responses, initiated talk) than control teachers. Project teachers averaged 17% less time with silence or confusion (category 10) in their classrooms than control teachers. Table 32 in Appendix D summarizes the amounts of time that reveal the above percentages.

The findings that significant differences existed in the verbal behavior of project teachers as compared to control teachers, and that the behaviors were substantially cognitive, are attributed in part by the writer to the combination of experiences in the project. The lack of evidence in the affective domain in all groups indicates a fundamental weakness that presents a challenge for future in-service efforts.

The informal sensitivity activities of the O. C. C. I. Region II project were directed toward developing teacher trust relationships within the project. The findings of the study indicate very little carryover into their classrooms in terms of teacher acceptance and

clarification of student feelings. Hough and Ober (3, p. 119) found that treatment which combined human relations training with instruction in interaction analysis produced significantly more accepting and clarifying behavior of teachers in simulated teaching situations. This study found no evidence of acceptance and clarification of student feelings in the control group.

Specific causes of change produced by single variables are not an objective of this study. The writer anticipated significant changes in the verbal behavior of teachers as a result of the collective introduction of many independent variables in the project. Differences between each project group were also anticipated. Differences between Groups A and B, and between Groups B and C are very significant at the .01 level. These hypotheses are based on the belief that the difference in the in-depth experiences of the groups would produce significant verbal behavior.

Group A teachers exercised more direct influence than Group B teachers by 188 tallies, which was not significant. Group A exercised less indirect influence than Group B by 226 tallies. The orientation programs for Groups A and B included a similar set of in-service experiences that were both extensive and intensive. The in-depth workshops that followed were quite different for the two groups. The verbal behavior demonstrated by teachers from each group is significantly different in the study. The experiences were therefore

sufficiently different to produce results that were significantly different.

Group A teachers exercised less direct influence than Group C teachers by 373 tallies, which was not significant. Group A exercised less indirect influence than Group C by 195 tallies. Group C teachers received much more abbreviated orientation experiences than Groups A and B. They also had different in-depth experiences for each of the five teams in the group. The difference in direct influence between Group A and Group C, although greater than differences between Groups A and B, was not significant. The Group C experience was much briefer and more inexpensive, yet the results obtained are not significantly different from Group A in one area.

Group B teachers exercised less direct influence than Group C teachers by 561 tallies, which was very significant. Group B exercised more indirect influence than Group C by 31 tallies. Group C utilized much more time than Group B (561) and more time than Group A (373) for direct influence. Group C also utilized more time for lecture (1104 tallies) as shown in Table 27, Appendix D than Group A (761 tallies) or Group B (601 tallies). From the same table, statistics show that Group C utilized less time for categories of student talk than utilized by the other two groups.

Major attention had been given in the project to the reduction of the amounts of time utilized for lecture and increasing the amount of

student participation in the classroom. The findings of this study reflect that effort, and indicate that the degree of success varied by descending order with Groups B, A, and C. Group C compared much more favorably with Groups A and B in the amounts of indirect influence than in the amounts of direct influence used. The findings further reveal the effectiveness of the project in that Group D (Table 27, Appendix D) utilized much more time (2475 tallies) for lecture than the three project groups (761, 601, 1104 tallies). Control Group D also utilized less time for student talk (2360 tallies) than the project groups (4274, 4496, 3625 tallies).

The results of this study indicate that in-depth experiences may be varied in nature. The results also indicate that project experiences were more effective for Groups A and B than Group C in reducing direct influence and increasing student participation. In comparison with the control group, the results show that the project experiences were effective in changing the verbal classroom behavior of selected teachers.

Recommendations

In view of the findings of this study, the writer offers the following recommendations to schools of teacher education, public schools and other groups concerned with in-service programs for teachers.

1. Experimentation should be conducted toward development of

change agents (curriculum catalysts) for each school facility, capable of identifying and implementing processes of involvement for teachers leading to the use of (1) inductive methods, and (2) teaching strategies that are applicable to the objectives of the social studies.

2. Institutions involved in in-service education should explore vehicles for introducing more of the affective domain into the classroom. Numerous techniques such as the value continuum and materials on controversial issues are available for developing qualities of receiving, responding, and valuing.
3. Institutions involved in in-service education should examine further possibilities for in-service curricular projects that include vertical representation of teachers from all grade levels (K-12). This experience can be especially valuable for a teacher to understand cognitive expectations of students on all grade levels in the various disciplines.
4. Further research is needed to determine the effects of social studies projects upon the verbal behavior of teachers in terms of the impact of each of the variables (in-service experiences) introduced in the projects.

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APPENDICES

APPENDIX A

Project Forms and Cover Letters

TO: O.C.C.I. Region II Local and Intermediate Education District Administrators and Curriculum Directors

FROM: Metropolitan Area Curriculum Center - January, 1967

SUBJECT: M.A.C.C. Social Studies Project (Title III E.S.E.A.)

PURPOSE AND PROCEDURE

The purpose of the M.A.C.C. Project is to improve Social Studies instruction.

The procedure will be to bring together approximately fifteen Social Studies teachers four days per month (two week days and two Saturdays) to explore new ideas and techniques for the teaching of Social Studies and to analyze critically what is currently happening in the Social Studies classrooms with regard to inter-relationships of behavior, and plan a summer workshop in which the "project group" plus consultants will develop skills in the teaching process so that they may be used as resource people for demonstrating to other teachers in the classroom.

The "project group" may be composed of representatives of classroom teachers from each of the grade levels K-12 plus two selected additionally from the K-4 level.

THE PROJECT TEACHER

The selection process for the project teacher is initially important because of the type of person needed. It is felt that the person chosen should be an exemplar in the profession, one who is doing a good job teaching a traditional Social Studies program, willing to submit to critical self-analysis and to share what is learned with others.

Since the project group is limited to a representative group of fifteen, we will solicit nominations from you and examine them critically within the time we have.

FINANCING THE PROJECT

The project was initiated as a cooperative venture between the Federal Government and the school districts. The project teacher will be expected to spend on the average of two scheduled school days per month on the project, time to be furnished by the school district represented. Additionally, the project teacher will be expected to spend two non-scheduled days per month, to be paid from project funds. Funds are also provided for local, regional and national consultants as well as the acquisition and dissemination of information.

The first phase of the project just described will continue through the remainder of the school year. The second phase will be a summer workshop in depth. The third phase involves followup experiences with project-devised materials under clinical supervision before attempting general demonstrations.

NOMINATIONS

Enclosed are nomination forms which we urge you to fill out and return immediately if interested. There is no limit to the number of nominations.

NOMINATION FORM

M.A.C.C. SOCIAL STUDIES PROJECT
TITLE III, E. S. E. A.

Groups A and B

I hereby place in nomination the name of _____

_____, a teacher of _____ in the

(grade or subject)

_____ school in _____ of

(school district)

_____ County. I understand and agree to the release of this teacher for an average of two teaching days per month or an estimated maximum of sixteen days for the remainder of the 1967-68 school year.

Signed _____

(Administrator or authorized representative)

I hereby agree to participate in the M. A. C. C. Social Studies Project with the understanding that it will involve an average of two school days (released time) and two Saturdays per month, remuneration for school days being the responsibility of my school district and remuneration for non-school effort coming from project funds. I am satisfied, dissatisfied with the present Social Studies program because:

(circle one)

Signed _____

(Nominee)

APPLICATION

M. A. C. C. SOCIAL STUDIES PILOT PROJECT

Group C

M. A. C. C. Commitments

- 1. The portion of funds necessary for teacher stipends for organized out-of-school time, sessions planned by M. A. C. C.
- 2. Sharing of consultants and resource people when possible to integrate with other project groups.
- 3. Sharing of facility, services and resources as available.
- 4. Act as a catalyst for the development of projects.

School District Commitments

- 1. The district (and individuals who apply) will be responsible for at least 2 days of scheduled school time per month, assuming the responsibility for substitutes.
- 2. Project members must commit a minimum of two Saturdays per month.
- 3. High priority assigned to the project as manifested by consistent attendance and participation.
- 4. Early initiation of planning for involvement of an entire school staff in a total commitment plan.
- 5. Provision of a team composed of a curriculum director and/or superintendent, a building principal and three teachers.

Any significant changes in federal funding will automatically necessitate reconsideration of commitments.

The above terms are acceptable to us and we therefore wish to participate.

(School District and Number)

by _____
(Chairman)

by _____
(Superintendent)

O. C. C. I. Region II

(County)

Metropolitan Area Curriculum Center

Social Studies Project

General Goal: The Improvement of Instruction

Objectives

(Designed to achieve the general goal)

1. To evaluate the teaching processes of the social studies program.
2. Articulation between grade levels.
3. To acquaint school personnel and the public of the explosion of knowledge and its impact on the social studies teaching process.
4. To acquaint school personnel and the public of the availability of recent materials which integrate the social studies disciplines.
5. Determining where we go from here.

Activities

(Designed to achieve objectives)

Objective No. 1 - To evaluate the teaching processes of the social studies program.

Possible Activities:

1. Films of planned classroom activities.
2. Typescripts (verbatim transcripts).
3. Audio tapes.
4. Video tapes.
5. Experience charts.
6. Cooperative unit planning and/or unit planning.
7. Resource people and materials.
8. Oral study.
9. Visitation.
10. Demonstrations.

Objective No. 2 - Articulation between grade levels.

Possible Activities:

1. Developing generalizations and identifying expectations by grade level.
2. Comparative treatment of given subject.
3. Grade level chairmen share in intergrade level council curriculum problems, ideas, achievements and report back.
4. Provide time and plans for visitations.

5. Exchange classes occasionally.
6. Develop a professional library of materials within a building.
7. Area grade level meetings.
8. In-service activities - intergrade subject area permanent committees.

Objective No. 3 - To acquaint school personnel and the public. Explosion of knowledge and its impact.

Possible Activities:

1. Television - commercial.
2. Films or video tapes.
3. P. T. A. programs.
4. In-service - meetings and/or classes.
5. Visitations to classes of project members.
6. Presentations to staffs, administrators and school boards by individuals and/or teams.
7. Reproduction and distribution of materials.

Objective No. 4 - To acquaint school personnel and the public. Availability of materials.

Possible Activities:

1. Lists of materials and descriptions.
2. Mailing lists for materials.
3. Lists of representatives for educational materials.
4. Encourage development of an evaluation committee in every school district.
5. Be a good, effective medium of interchange of ideas.
6. Impress upon school districts the critical need for investment in curriculum materials.
7. Encourage audio-visual directors and librarians to set up planned visits to their centers by their teachers.
8. Encourage provision of open houses and similar activities for public information.

Objective No. 5 - Determining where we go from here.

Possible Activities:

1. Plan and develop video tapes to illustrate use of selected materials and identify teaching processes needed. (Develop a set of generalizations for a major concept, K-12).
2. Organize teams to present video tapes, teams for each level.
3. Develop position paper for reinforcement.
4. Bring in experts and share them in general meetings.
5. Newsletter for sharing ideas.

Planning Video Tapes:

1. Develop generalizations for concepts on all grade levels.
2. Identify the materials needed.
3. Identify the teaching strategies to be used.
4. Prepare script outline, then the script.
5. Roleplay as a preliminary trial run.
6. Record by video tape in the classroom.

GENERAL THEME - URBANIZATION
(Worksheet)

Subtheme for grade levels _____
(List grade levels)

Major generalizations for grade levels _____
by disciplines. (List grade levels)

Sociology _____

Economics _____

Geography _____

History _____

Political
Science _____

Anthropology _____

Other _____

(A sample module) Theme - URBANIZATION
Sociology Concept - CULTURAL CHANGE

OBJECTIVES	DATA PRESENTED	DATA SOURCES	STRATEGIES	EVALUATION
To realize that the rapid development of technology forces the individual to make alternative behavioral choices.	Portland Metropolitan Area.	Slides:	Show slides.	Small Group Discussion and Report
	Selected cities of the world.	Portland Metropolitan Area - urban renewal.	What would be your reaction if you had to move because of progress?	Use inquiry to obtain generalizations about choices, change.
Teacher Objective: To teach the concept of cultural change.		Filmstrip: Problems of the city. -E. B.	List choices open to you on board. If you move, what happens to social group?	<hr/>
		Magazine: Scientific American- September, 1965 issue, pp. 91-100	Where will you go to school? to church? Questions on social adjustment, here and elsewhere in world. Examples, discuss. Distribute pages of Scientific American to read. Break into small groups next day to discuss ideas of magazine.	

Typescript taken by Mrs. Shirley Petery
for Mrs. Maude Barrett - 5th Grade
Margaret Scott School - Reynolds

T: You will need your social studies books (pupils get books en masse) Turn to map of N. Central States - much to cover

P: (questions)

T: (answers)

P: (question regarding day's work)

T: (answers regarding day's work) Explains guest's presence

T: When we started studying social studies we tried to find out why people live where they do. Let's remember reasons

P: jobs (teacher writes on board)

T: Who can think of word?

P: handicraft

P: manufacturing

P: industries

T: (writes on board) Another reason?

P: Land and stuff

T: kinds of land - what can we call that

P: property

resources

soil

T: I think resources is good - what else?

P: natural resources

T: What else?

S: (discusses natural resources)

P: climate

P: (and teacher discuss climate)

P: Land formation

T: Think of another word

P: (much discussion)

T: (writes surface areas on board) Any more reasons?

P: Food - game - water - fishing

T: Does anything on board cover that?

P: Natural resources

P: (discussion, discussion, discussion)

T: Shall we put transportation down - other reasons

P: (much discussion)

T: Anything else?

T: Why do some people stay in one state and others move

T: Where would we go to find desc. of Brone, Smith

P: (comment)

T: Don't some people like to stay where they are? family & friends Can we think of a heading?

p: ancestors, etc, etc.

T: What about history, e. g., history of the family. Shall we put that up?

T: Can you think of any other reasons?

T: Let's see what we can put under these. Which shall we take

P: Manufacturing

T: Look at maps

P: people - money - machines - power - transportation - raw materials - markets

T: Let's look at map - how can we tell where people are?

P: (much comment)

T: Look at legend

T: Greg, where would be many people

P: Detroit, Michigan

T: Why there

P:

T: Another please

P: Chicago, Cleveland, Cincinnati, etc. etc.

T: Look to see if cities are in any special place

P: Near water

P: Lakes and rivers

P: for transportation and power

T: Located near water - so they'll have. . . . (points and names various items on board list)

T: How about raw materials - Look at map - What kind of raw materials there? Bruce, what do you think? Scott?

P: Lumber

T: Very well could be

T: What would be the main industry? points to sect. on wall map. Tanya? What work would people do if not manufacturing.

- P: Farming - fruit farm - canneries (much general comment about farming)
- P: Corn belt
- T: Explain
- P: Gives states names
- T: What industries connected?
- P: Canning
- P: Feed for cattle
- T: What else
- P: (comments)
- T: meat packing, plants
- T: other farm products for industry
- P: flour mills
- T: summarizes - from map where manufacturing is prominent - where agri. is.
- T: asks students to recapitulate
- P: much comment esp. about farming

EVALUATION FORM

M. A. C. C. Social Studies Project

To the teachers: Evaluation is important to anything we do. Early in the project we worked hard to develop the trust relationship so that we could expose the results of our efforts without fear of recriminations. Your frank and positive evaluation of the project to date is needed at this time to help us ascertain future needed efforts. Use the points for comment below if you wish, or write us a letter.

- I. Evaluate the general design for the project.

- II. Adequacy of professional assistance and guidance.

- III. Did you or do you feel challenged? Pressured? If so, in what way?

- IV. Would you like to see your district provide this identical opportunity for your building staff? Or with some variations? If so, what variations?

- V. In reference to our project goal, remember the objectives you spelled out and the activities you identified and engaged in to achieve these objectives! Do you anticipate accomplishing these objectives? If not, your suggestions please!

APPENDIX B

Observer Reliability

Estimating reliability:--A method of estimating reliability should be as simple and quick to calculate as possible. Bales (5, p. 104) proposes an adaptation of Chi-square which was found to be less appropriate for our purposes than was Scott's (10) coefficient. Scott's method is unaffected by low frequencies, can be adapted to percent figures, can be estimated more rapidly in the field, and is more sensitive at higher levels of reliability.

Scott calls his coefficient "pi" and it is determined by the two formulae below.

$$\pi = \frac{p_o - p_e}{1 - p_e} \quad (1)$$

p_o is the proportion of agreement, and p_e is the proportion of agreement expected by chance which is found by squaring the proportion of tallies in each category and summing these over all categories.

$$p_e = \sum_{i=1}^k p_i^2 \quad (2)$$

In formula two there are k categories and p_i is the proportion of tallies falling into each category. π , in formula one, can be expressed in words as the amount that two observers exceeded chance agreement divided by the amount that perfect agreement exceeds chance.

In estimating reliability during training, problems of tempo or the speed of tallying are less important than the proportional distribution within the categories. Sooner or later in the training cycle observers settle down to the required tempo of 20 to 25 tallies per minute. Effective training, however, requires immediate feedback regarding category discriminations, so we chose to modify Scott's method by converting tallies into percent figures and developing a graphical method for estimating p_e from the size of the two largest categories. The resulting short-cut method can be quickly estimated

in the field by the use of a pocket slide rule.

The procedure we now use is as follows. Step One: the original tallies are recorded as "hash marks" (~~||||~~, ||||, etc.) for quick summing on a sheet containing ten columns, one for each category.

Step Two: add column totals, divide each by the grand total, and multiply by 100 to convert to percent.

Step Three: while one observer finds the total percent disagreement by subtracting the percent figures corresponding to each category--summed over all categories, the other observer estimates p_e by entering Figure 1 with the largest and second largest categories as determined by either distribution or averaged from both.

Step Four: p_o is determined by subtracting the total percent disagreement from 100.

Step Five: π is found by entering Figure 2 with p_o and P_e .

The tallies of two trainees after about ten hours of training are shown in Table 1, columns two and three. The proportion of tallies in each category is expressed as a percent in columns four and five. The differences between columns four and five are shown in column six and the sum of this column is the percent disagreement. Column seven, consisting of the average percent falling in each category squared, is not normally calculated by observer trainees, but it is included here as the most accurate estimate of p_e ; in this case $p_e = 23.7$ and is shown as the sum of column seven. This number can be compared with two estimates of p_e that the observer trainees would obtain by using Figure 1.

First, if Trainee A entered Figure 1 with his two highest categories, 41% and 21%, he would estimate p_e as 25+%. Second, if Trainee B made the same estimate with his highest, 38% and 23%, his estimate would be 24%.

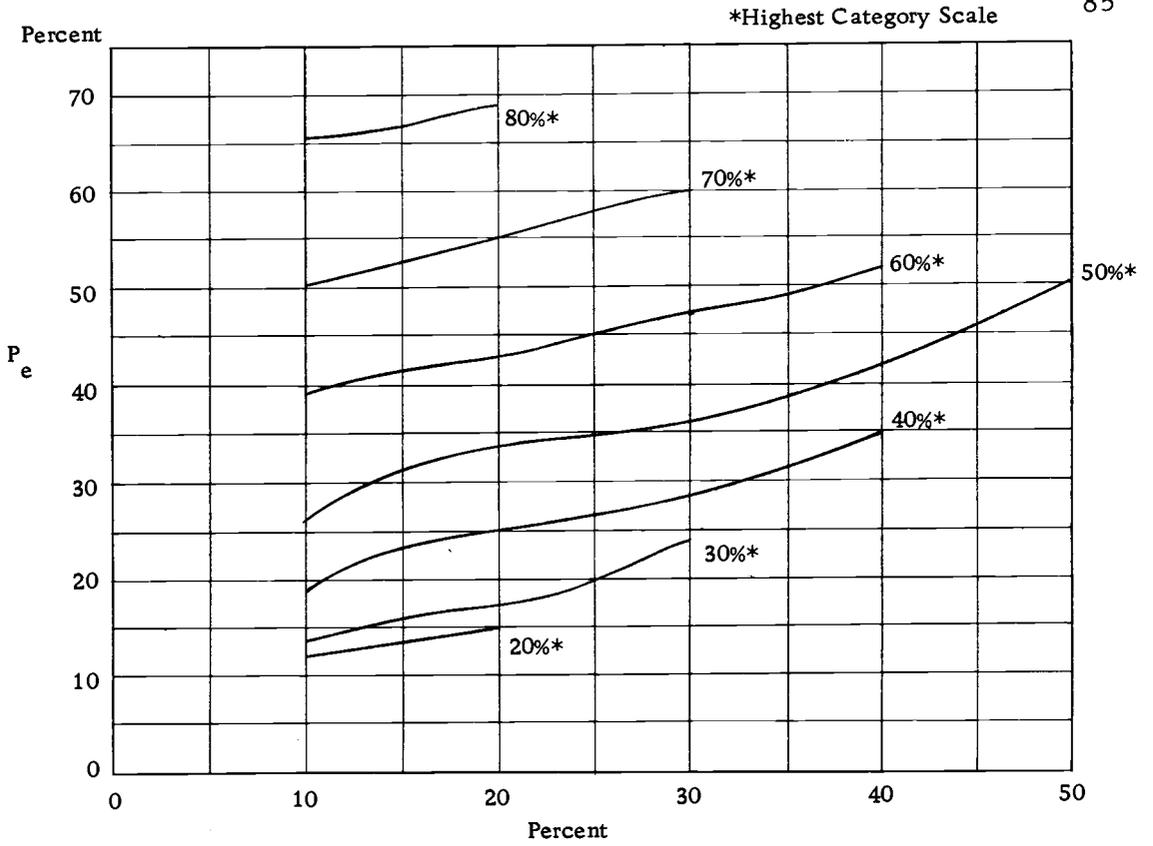


Figure 1. Second Highest Category Scale

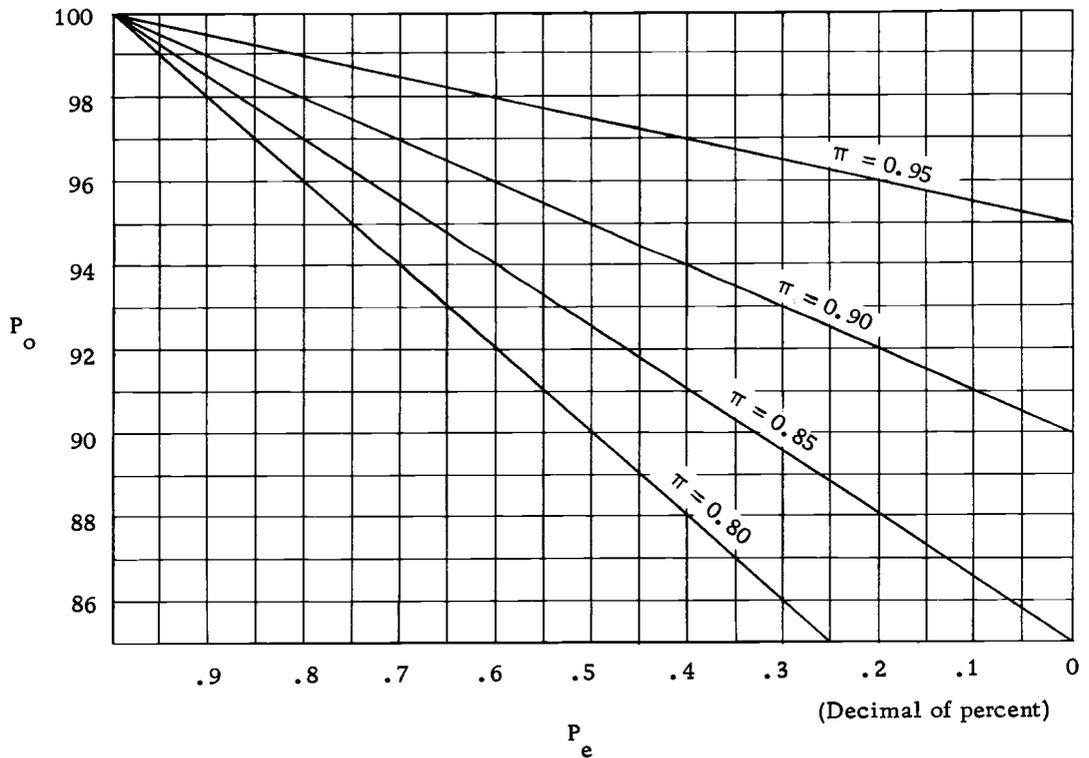


Figure 2.

Table 1. Calculating Reliability by Scott's Method Using Percent*

Category (1)	Observer		%A (4)	% B (5)	% Diff. (6)	(Ave. %) (7)
	A (2)	B (3)				
1	12	9	3.3	2.1	1.2	.072
2	3	4	0.8	0.9	0.1	.008
3	24	34	6.5	8.1	1.6	.403
4	25	25	6.8	5.9	0.9	.530
5	76	97	20.7	23.1	2.4	4.840
6	3	7	0.8	1.8	1.0	.017
7	3	4	0.8	0.9	0.1	.007
8	151	160	41.2	38.0	3.2	15.500
9	51	59	13.9	14.1	0.3	1.960
10	19	22	5.4	5.2	0.2	.280
Totals	361	421	100.2	100.1	11.0	23.617

*The figures in columns 4, 5, & 7 were found by using a pocket slide rule.

Below are three calculations of π using these three estimates p_e .

$$\pi = \frac{P_o - p_e}{100 - p_e} = \frac{[100 - 11] - 23.6}{100 - 23.6} = \frac{65.4}{76.4} = 0.855 \quad p_e \text{ estimated from Column 7.}$$

$$\pi = \frac{P_o - p_e}{100 - p_e} = \frac{[100 - 11] - 24}{100 - 25} = \frac{64}{75} = 0.853 \quad p_e \text{ estimated by Trainee A.}$$

$$\pi = \frac{P_o - p_e}{100 - p_e} = \frac{[100 - 11] - 24}{100 - 24} = \frac{65}{76} = 0.854 \quad p_e \text{ estimated by Trainee B.}$$

These three estimates are quite close and show that a graphical-slide rule method of estimation is quite adequate for training purposes.

(Reading a pocket slide rule to three significant figures is part of the "art" of observing.)

Scott's reliability coefficient as we use it, is quite arbitrary.

It is legitimate to ask about the approximate error involved when observers maintain a coefficient of 0.85 or higher. One way to illustrate all errors¹ is shown in Table 2.

In rows one through seven the errors are shown separately for each category in the numerator and the total judgments are shown in the denominator. Row eight shows the percent error of the fraction just above in row seven. The percent of total judgments falling in each category is shown in row nine, based on the grand total, 10,735. Row ten is a crude estimate of the limits of error for each category.

The limits are estimated as follows: for category one, two-thirds (approximately 63.7%) of 0.10 (row nine) is 0.06 which can be expressed as ± 0.03 ; for category two, 14.4% of 1.17 is about 0.18, expressed as ± 0.09 and so on.

An inspection of row eight indicates that error decreases with increasing frequency of a category. The especially high error of category seven is caused by the poor performance of April 10th when one observer used a tape recording without the benefit of seeing the original interaction. Table 2 gives ample evidence that this system of interaction analysis is far from a precision instrument, but when the combined error limits of any two categories is small compared with the difference between the two categories, it is proper to proceed with statistical tests of significance.

A continuous estimate of observer error could be obtained if two observers were always present at each observation. Such duplication is costly in both time and money; with proper training and control, observer teams can maintain reliability with weekly discussions and bi-monthly reliability checks. A Scott coefficient of 0.85 or higher is a reasonable level of performance.

¹There are many different types of error: (a) omission; (b) heard it, but misclassified it; (c) failed to record it--dropped pencil; etc.

Table 2. Errors for Two Observers during a Four Month Period

Row	Date of Observation	Category*									Total	π
		1	2	3	4	5	6	7	8&9	10		
1	January 6	<u>1</u> 1	<u>6</u> 30	<u>1</u> 33	<u>11</u> 105	<u>26</u> 816	<u>6</u> 28	<u>3</u> 15	<u>12</u> 154	<u>6</u> 30	<u>72</u> 1,212	.88
2	January 12	<u>1</u> 1	<u>4</u> 40	<u>4</u> 36	<u>1</u> 187	<u>50</u> 884	<u>1</u> 13	<u>1</u> 3	<u>3</u> 361	<u>9</u> 76	<u>74</u> 1,601	.92
3	April 2	<u>4</u> 8	<u>3</u> 11	<u>7</u> 67	<u>3</u> 107	<u>4</u> 516	<u>0</u> 12	<u>1</u> 5	<u>2</u> 367	<u>5</u> 23	<u>29</u> 1,116	.96
4	April 10**	<u>0</u> 0	<u>0</u> 10	<u>4</u> 26	<u>5</u> 291	<u>86</u> 906	<u>24</u> 294	<u>26</u> 82	<u>24</u> 566	<u>12</u> 42	<u>181</u> 2,217	.88
5	May 1	<u>0</u> 0	<u>3</u> 13	<u>0</u> 18	<u>7</u> 243	<u>33</u> 1209	<u>5</u> 283	<u>3</u> 13	<u>7</u> 405	<u>5</u> 62	<u>63</u> 2,246	.96
6	May 29	<u>1</u> 1	<u>2</u> 21	<u>8</u> 8	<u>33</u> 273	<u>11</u> 727	<u>12</u> 62	<u>0</u> 2	<u>3</u> 1168	<u>9</u> 81	<u>79</u> 2,343	.94
7	Total Errors Tallies	<u>7</u> 11	<u>18</u> 125	<u>24</u> 188	<u>60</u> 1206	<u>210</u> 5058	<u>48</u> 692	<u>34</u> 120	<u>51</u> 3021	<u>46</u> 314	<u>498</u> 10,735	
8	% Error	63.7	14.4	12.8	5.0	4.1	6.9	28.3	1.7	14.6	4.66	
9	% Category	0.10	1.17	1.75	11.24	47.20	6.45	1.12	28.17	2.32		
10	Category Limits	<u>+0.03</u>	<u>+0.09</u>	<u>+0.11</u>	<u>+0.23</u>	<u>+0.97</u>	<u>+0.22</u>	<u>+0.16</u>	<u>+0.24</u>	<u>+0.21</u>		

*Categories 8 and 9 were not separated in 1956, all student talk appeared in one category.

**Reliability check "live" vs. tape recording.

Reliability and Observer Performance: -- One question often asked is how much training with this set of categories is required by professional educators in order to achieve a satisfactory level of reliability. Two factors enter into this discussion: first, what is meant by satisfactory? and second, how talented are the professional educators?

A satisfactory level of performance for research might be set at "that level which produces errors in observation which are very small compared with the differences among the data being compared." For example, if two groups of teachers are being compared, then we would like the percent error of observation to be very small compared with the differences found to exist between the two groups. As was shown in Table 2, the percent error will be different for each category and, for that matter, each cell of the matrix described in the next section.

A satisfactory level of performance for inservice training might be set much lower. Suppose two teachers work together, each observing the other, but their errors of observation are rather large due to lack of skill and training. As one teacher reports his observation to another, discussion or even argument may develop concerning the classification of verbal statements. Such discussions may not only benefit the observer, they are equally helpful to the teacher who was observed. He may gain new insights into his own behavior by discovering how others perceive his actions. Progress toward the goal of improving classing behavior may occur even though observations were inaccurate.

Two simple statistics used for informal observation are the i/d and I/D ratios. In these ratios: i = total tallies in categories 1+2+3 and d = the total for categories 6+7; while I = 1+2+3+4 and D = 5+6+7. These two ratios help teachers visualize changes in the proportion of

indirect to direct influence when one episode is compared to another. Table 3 illustrates the error which can occur in i/d and I/D ratios at different levels of the Scott coefficient. Notice that the errors are much smaller as the total number of tallies increases. However the error in shorter episodes may not be so large as to preclude utility. For example, the two observers whose tallies were used in Table 1, both show what are relatively above average ratios, in spite of only 20 minutes of observing. The i/d ratio for observer A's data is 6.33 and for observer B's data, 4.27. Turning to the I/D ratio, A = 0.78 and B = 0.67. If asked to interpret their ratios, each observer could report results above normative expectations (i. e., the normative expectation for I/D is below 0.4 and for i/e is below 0.75.) Less error in observation would be required for making smaller distinctions.

Table 3. Error in I/D and i/d Ratios at Different Scott Reliability Coefficients

Row	Scott Index	Observer A		Observer B		Total Tallies ^b
		I/D	i/d	I/D	i/d	
(a)	0.83	0.870	a	0.670	a	300
(b)	0.88	0.197	1.490	0.210	1.380	1,212
(c)	0.96	0.182	0.105	0.184	0.112	2,246
(d)	0.96	0.362	5.040	0.391	5.550	1,116

^aNo data in categories 6 and 7 for either observer.

^bAverage for both observers.

Typical progress in observer training is shown in Figure 3. The individual progress of 21 principals and supervisors is shown by plotting Scott coefficients during early attempts to classify the statements heard on tape recordings. Each training session consisted of about

two hours and the reliability checks occurred at the end of the first four sessions. The individuals in the top half of this group probably have the potential of reaching performance levels required by research projects with additional training. One would expect these reliability levels to increase as soon as live classroom situations were observed compared with tape recordings. The additional cues and usually more simple interaction patterns that occur in the classroom, compared with the training tapes, result in higher reliability.

To return to the original question; given an average group of educators, a minimum of four hours for observer training seems necessary in an inservice training project and a minimum of twelve hours will probably be necessary in a research project. The required level of performance, for either type of project, will probably not be attained by some people in the group.

Table 4. Calculating Reliability by Scott's Method Using Percent

Category	% for Key	% for Student	% of Difference
1	0	0	0
2	1%	1%	0
3	18%	17%	1%
4	20%	23%	3%
5	28%	22%	6%
6	4%	6%	2%
7	0	0	0
8	21%	20%	1%
9	2%	4%	2%
10	1%	2%	1%
Total			16%

$$100 - 16 = 84\%$$

$$P_i = \frac{P_o^* - P_e^*}{100 - P_e} = \frac{84 - 24}{76} = \frac{60}{76} = \underline{\underline{.81}}$$

* P_o is 100 minus the total for % of difference

* P_e is 24 for this matrix

Observer T. Haines

APPENDIX C

Sample Matrices

Flanders Categories

Table 5. Content Analysis Worksheet (Tabulation Matrix)

Students 18 Students talk 10 Teacher Barry Roberts - Reynolds

Class Social Studies Topic Russian Influence in South American

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	10	9	9	9	3	3	5	9	9	4	9	4	9	9	8	9	4	9	9	9
2	5	9	9	9	3	4	5	9	9	8	9	4	9	1	8	9	9	9	9	9
3	4	5	9	9	3	10	5	9	9	9	2	1	9	1	8	9	9	9	9	9
4	8	8	9	9	8	10	5	9	9	9	8	8	9	1	8	9	2	9	9	9
5	9	9	4	9	9	10	5	4	9	9	9	1	9	8	8	9	5	9	3	9
6	9	9	9	9	9	4	5	10	9	9	9	9	3	10	8	9	4	9	3	3
7	9	9	9	9	9	9	5	4	9	5	9	9	3	5	8	9	9	9	3	4
8	9	9	9	9	9	9	4	4	9	4	9	9	3	1	8	9	9	9	3	3
9	9	9	9	9	9	9	9	10	9	4	9	9	3	1	4	9	2	9	3	3
10	9	9	9	9	9	3	9	9	9	4	9	9	3	9	4	9	2	9	3	4
11	9	9	9	9	9	3	9	9	9	8	9	4	4	9	4	9	4	9	3	4
12	9	9	9	9	5	4	9	9	9	8	9	9	8	9	8	9	1	9	3	4
13	9	9	9	3	4	9	9	9	9	5	9	4	8	9	4	9	1	2	4	8
14	9	9	9	3	3	5	9	9	9	5	9	9	8	4	8	4	1	4	4	8
15	9	9	9	9	4	5	2	9	9	5	9	9	9	4	4	9	3	8	4	9
16	9	9	9	3	4	5	3	9	9	5	9	9	9	4	8	9	4	8	4	3
17	9	9	9	4	9	5	5	9	9	8	9	9	9	4	9	5	8	9	8	3
18	9	9	9	4	9	5	5	9	9	5	9	9	9	8	9	5	8	9	4	6
19	9	9	9	8	9	5	4	9	9	9	4	9	9	8	9	5	8	9	8	4
20	10	9	9	8	9	5	9	9	9	9	4	9	9	8	9	5	8	9	9	4

Categories For Interaction Analysis

Teacher Talk Indirect Influence	<p>1.* ACCEPTS FEELING: accepts and clarifies the feeling tone of the students in a non-threatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.</p> <p>2.* PRAISES OR ENCOURAGES: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying, "um hm?" or "go on" are included.</p> <p>3.* ACCEPTS OR USES IDEAS OF STUDENTS: clarifying, building, or developing ideas suggested by a student. As a teacher brings more of his own ideas into play, shift to category five.</p> <p>4.* ASKS QUESTIONS: asking a question about content or procedure with the intent that a student answer.</p>
<hr/>	
Direct Influence	<p>5.* LECTURING: giving facts or opinions about content or procedure; expressing his own ideas, asking rhetorical questions.</p> <p>6.* GIVING DIRECTIONS: directions, commands, or orders to which a student is expected to reply.</p> <p>7.* CRITICIZING OR JUSTIFYING AUTHORITY: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.</p>
<hr/>	
Student Talk	<p>8.* STUDENT TALK--RESPONSE: a student makes a predictable response to teacher. Teacher initiates the contact or solicits student statement and sets limits to what the student says.</p> <p>9.* STUDENT TALK--INITIATION: talk by students which they initiate. Unpredictable statements in response to teacher. Shift from 8 to 9 as student introduces own ideas.</p>
<hr/>	
	<p>10.* SILENCE OR CONFUSION: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.</p>
<hr/>	

* There is no scale implied by these numbers. Each number is classificatory, it designates a particular kind of communication event. To write these numbers down during observations is to enumerate, not to judge a position on a scale.

Table 6. Interpretation Matrix

Grade <u>7</u> Group <u>B</u> Name <u>Ronald Witzel</u> Date <u>4/69</u>											
Students <u>30</u> Students Responded <u>21</u> Observation No. <u>2</u>											
*C	1	2	3	4	5	6	7	8	9	10	Total
1			1						1		2
2		5	3		3	2		1	5		19
3		4	31	3	4	4		2	6		54
4				4		1		11		1	17
5	1	3	2	3	18	3			1		31
6			1	1	2	3		1	15		23
7											0
8		3	5	2	1	1		15	3		30
9	1	4	11	3	2	9			189	1	220
10				1	1						2
T	2	19	54	17	31	23	0	30	220	2	398
%	0	5	14	4	8	6	0	8	55	0	100
	23% (indirect)			14% (direct)			63% (student) (silence)				
	37%										

APPENDIX D

Tables

Table 7. Observation Tallies for Direct and Indirect Influence used by Project Groups A, B, C and Group D

Influence	1	2	3	Col. 2, 3 Difference
	Total A+B+C	Average A+B+C	Group D	
Direct	4583	1527.6	3276	1748.4
Indirect	5362	1787.32	1628	159.32

Table 8. Chi-square Test of Differences in Direct and Indirect Influence used by Teachers in Project Groups A+B+C as compared to the Control Group D

Influence	Groups A+B+C	Group D	Total
Direct	4583	3276	7859
(Expected)	(5263.5)	(2595.5)	
Indirect	5362	1628	6990
(Expected)	(4681.5)	(2308.5)	
Total	9945	4904	14849
Deviation = 680.5		Chi-square = 411.69	
Degree of Freedom = 1			

Table 9. Observation Tallies of Time utilized for Lecture and Questions by Project and Control Groups

Category	1	2	3	Col. 2, 3 Difference
	Total A+B+C	Average A+B+C	Group D	
Lecture	2466	822	2475	1653
Questions	2636	878.66	803	75.66

Table 10. Chi-square Test of Differences between the Amount of Questions and Lecture-time utilized by Project and Control Groups

Category	Groups A+B+C	Group D	Total
Questions (Expected)	2636 (2093.76)	803 (1345.24)	3439
Lecture (Expected)	2466 (3008.24)	2475 (1932.76)	4941
Total	5102	3278	8380
Deviation = 542.24		Chi-square = 608.86	
Degree of Freedom = 1			

Table 11. Observation Tallies of Time utilized for Praise and Criticism by Project and Control Groups

Category	1 Total A+B+C	2 Average A, B, C	3 Group D	2, 3 Difference
Praise	429	143	112	31
Criticism	128	42.6	41	1.6

Table 12. Chi-square Test of Differences between Praise and Criticism utilized by Project and Control Groups

Category	Groups A+B+C	Group D	Total
Praise (Expected)	429 (412.22)	112 (128.78)	541
Criticism (Expected)	128 (144.78)	41 (24.22)	169
Total	557	153	710
Deviation = 16.78		Chi-square = 16.44	
Degree of Freedom = 1			

Table 13. Observation Tallies of Time utilized for idea-acceptance and direction-giving by project and control groups

Category	1	2	3	Col. 2, 3 Difference
	Total A+B+C	Average A+B+C	Group D	
Idea-acceptance	2290	763.33	713	50.33
Direction-giving	1989	663	760	97

Table 14. Chi-square Test of Differences between the Amount of Idea-acceptance and Direction-giving utilized by Project and Control Groups

Category	Groups A+B+C	Group D	Total
Idea-acceptance (Expected)	2290 (2233.97)	713 (769.03)	3003
Direction-giving (Expected)	1989 (2045.03)	760 (703.97)	2749
Total	4279	1473	5752
Deviation = 56.03		Chi-square = 11.48	
Degree of Freedom = 1			

Table 15. Observation Tallies of Time utilized for Authority Justification and Feelings Acceptance by Project and Control Groups

Category	1	2	3	Col. 2, 3 Difference
	Total A+B+C	Average A+B+C	Group D	
Authority	128	42.6	41	1.6
Feelings	7	2.33	0	2.33

Table 16. Chi-square Test of Differences between the Amount of Authority and Feelings-acceptance utilized by Project and Control Groups

Category	Groups A+B+C	Group D	Total
Authority (Expected)	128 (129.63)	41 (39.37)	169
Feelings (Expected)	7 (5.37)	0* (1.63)	7*
Total	135	41	176

* Insufficient Data

Table 17. Observation Tallies of Time utilized for Initiated Talk and Predictable Responses by Project and Control Teachers

Category	1	2	3	Col. 2, 3 Difference
	Total A+B+C	Average A+B+C	Group D	
Predictable	5788	1929.3	1586	343.3
Initiated	6607	2202.3	774	1428.3

Table 18. Chi-square Test of Differences between the Amount of Predictable and Initiated Student Talk utilized by Project and Control Groups

Category	Groups A+B+C	Group D	Total
Predictable (Expected)	5788 (6194.55)	1586 (1179.45)	7374
Initiated (Expected)	6607 (6200.45)	774 (1180.55)	7381
Total	12395	2360	14755

Deviation = 406.55
Degree of Freedom = 1

Chi-square = 333.46

Table 19. Observation Tallies of Time utilized for Silence, Lecture, and Student Talk by Project and Control Teachers

Category	1 Total A+B+C	2 Average A+B+C	3 Group D	Col. 2, 3 Difference
Silence	1131	377	452	75
Lecture	2466	822	2475	1653
Student Talk	12395	4131.6	2360	1771.6

Table 20. Chi-square Test of Differences between the Amounts of Silence, Lecture and Student Talk utilized by Project and Control Groups

Groups	Silence	Lecture	Student Talk	Total
A+B+C (Expected)	128 (127.52)	2466 (3728.14)	12395 (11133.29)	14989
D (Expected)	41 (41.48)	2475 (1212.81)	2360 (3621.71)	4876
Total	169	4941	14755	19865
Deviations	+ .48 - .48	-1262.19 +1262.19	+1261.71 -1261.71	0 0
Degree of Freedom = 2	Chi-square = 2323.51			

Table 21. Observation Tallies for Direct and Indirect Influence exercised in Classrooms of Groups A and B

Influence	Group A	Group B	Difference
Direct	1466	1278	188
Indirect	1647	1873	226

Table 22. Chi-square Test of Differences in Direct and Indirect Influence of Groups A and B

Influence	Group A	Group B	Total
Direct (Expected)	1466 (1363.7)	1278 (1380.3)	2744
Indirect (Expected)	1647 (1749.3)	1873 (1770.7)	3520
Total	3113	3151	6264

Deviation = 102.3
Degree of Freedom = 1

Chi-square = 27.00

Table 23. Observation Tallies for Direct and Indirect Influence exercised in Classrooms of Groups A and C

Influence	Group A	Group B	Difference
Direct	1464	1839	373
Indirect	1647	1842	195

Table 24. Chi-square Test of Differences in Direct and Indirect Influence of Teachers in Groups A and C

Influence	Group A	Group B	Total
Direct (Expected)	1466 (1514.3)	1839 (1790.7)	3305
Indirect (Expected)	1647 (1598.7)	1842 (1890.3)	3489
Total	3113	3681	6794

Deviation = 48.3
Degree of Freedom = 1

Chi-square = 5.52

Table 25. Observation Tallies for Direct and Indirect Influence exercised in Classrooms of Groups B and C

Influence	Group B	Group C	Difference
Direct	1278	1839	561
Indirect	1873	1842	31

Table 26. Chi-square Test of Differences in Direct and Indirect Influence of Teachers in Groups B and C

Influence	Group B	Group C	Total
Direct	1278	1839	3117
(Expected)	(1437.6)	(1679.4)	
Indirect	1873	1842	3715
(Expected)	(1713.4)	(2001.6)	
Total	3151	3681	6832

Deviation = 159.6
Degree of Freedom = 1

Chi-square = 59.85

Table 27. Total Observation Tallies

Category	Totals A+B+C	Group A	Group B	Group C	Average A+B+C	Group D
1	7	1	2	4	2.33	0
2	429	157	167	105	143.00	112
3	2290	634	756	900	763.33	713
4	2636	855	948	833	878.66	803
5	2466	761	601	1104	822.00	2475
6	1989	681	620	688	663.00	760
7	128	24	57	47	42.60	41
8	5788	1916	2136	1736	1929.30	1586
9	6607	2358	2360	1889	2202.30	774
10	1131	390	222	519	377.00	452

Categories	Totals A+B+C	Average A+B+C	-	Group D	=	Difference
Indirect Influence (1 + 2 + 3 + 4)	5362	1787.32	-	1628	=	159.32
Direct Influence (5 + 6 + 7)	4583	1527.6	-	3276	=	1748.4

Total observation tallies for the study 31,187

% Project Teacher Talk = 53%

% Control Teacher Talk = 70%

Table 28. Group A - Total Tallies

	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	1	0	0	0	0	1
2	0	24	18	25	13	33	0	14	24	6	157
3	0	23	211	156	53	59	1	23	91	17	634
4	0	3	0	243	16	5	1	539	16	32	855
5	1	9	10	78	523	73	0	5	52	10	761
6	0	1	2	37	26	258	7	191	130	29	681
7	0	0	0	1	0	10	4	4	2	3	24
8	0	48	232	196	40	126	2	1126	114	32	1916
9	0	46	156	93	47	81	8	3	1897	27	2358
10	0	3	5	26	43	35	1	11	32	234	390
Total	1	157	634	855	761	681	24	1916	2358	390	7798

Table 29. Group B - Total Tallies

	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	1	0	0	0	0	0	1	0	2
2	0	26	17	21	17	30	0	9	44	3	167
3	0	28	285	139	35	53	3	42	167	4	756
4	0	1	0	280	12	9	3	602	15	26	948
5	1	7	7	74	403	45	2	6	49	7	601
6	0	3	8	49	29	242	7	128	133	21	620
7	0	0	4	8	1	11	18	10	5	0	57
8	0	51	225	196	27	90	14	1307	198	28	2136
9	1	51	208	148	56	116	10	18	1734	18	2360
10	0	0	1	33	21	24	0	14	14	115	222
Total	2	167	756	948	601	620	57	2136	2360	222	7869

Table 30. Group C - Total Tallies

	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	1	0	0	0	3	0	4
2	0	17	16	21	11	19	0	2	15	4	105
3	0	29	409	150	66	65	0	29	131	21	900
4	0	1	3	224	12	15	2	536	17	23	833
5	1	6	5	94	833	79	1	1	58	26	1104
6	0	1	2	30	33	287	10	109	159	57	688
7	0	0	0	3	3	14	14	4	3	6	47
8	0	23	251	167	25	74	6	1030	130	30	1736
9	3	28	211	115	76	81	10	2	1344	19	1889
10	0	0	3	29	44	54	4	23	29	333	519
Total	4	105	900	833	1104	688	47	1736	1889	519	7825

Table 31. Group D - Total Tallies

	1	2	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	10	17	20	22	22	0	7	7	7	112
3	0	25	248	141	131	67	0	42	42	17	713
4	0	2	2	186	28	9	1	521	8	46	803
5	0	6	9	147	2064	107	3	16	86	37	2475
6	0	1	4	32	44	368	5	179	89	38	760
7	0	0	2	5	4	3	15	6	4	2	41
8	0	44	314	186	50	93	11	786	54	48	1586
9	0	20	111	42	69	45	3	1	474	9	774
10	0	4	6	44	63	46	3	28	10	248	452
Total	0	112	713	803	2475	760	41	1586	774	452	7716

Table 32. Percentage Comparisons - Verbal Influence, Student Talk, Silence or Confusion

	Project Average Tallies	Total Control Tallies	Percentage Difference
Direct Influence	1527	3276	54%
Indirect Influence	1787	1628	9%
Student Talk	4131	2360	43%
Silence, Confusion	377	452	17%