A comparison of the verbal teaching patterns of two groups of secondary student teachers, Montana State University, 1969-70
by Dennis Larry Martinen

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree \ of DOCTOR OF EDUCATION in Secondary Education
Montana State University

Abstract:
The problem in this study was to investigate the verbal teaching patterns of secondary student teachers and to determine essentially what these teaching patterns were. As a corollary to the problem, the Rokeach Dogmatism Scale and the Teaching Situation Reaction Test were administered to student teachers to determine if these tests could predict successful student teachers prior to their student teaching experience in the secondary schools of Montana.

It was the purpose of this study, then, to record and analyze the verbal behavior patterns of two groups of secondary student teachers. One group, the control group, consisted of students who went through the regular training program. The other group received twenty hours of training in interaction analysis. Selected aspects of the reconstructed Flanders' matrix were compared and analyzed.

Another aspect of the problem dealt with the possible predictive value of the Teaching Situation Reaction Test and the Rokeach Dogmatism Scale as they pertained to superior teaching. A comparison and analysis was made between scores achieved on the two tests and such quantitative elements as grade point average in the major subject area, mean scores on the rating forms used by Montana State University supervisors and the grade given to measure the success in student teaching.

Procedures. The Fall Quarter, 1969, student teacher group was selected on a random basis from among those available teaching English, social studies, history, mathematics, biology. The Winter Quarter group was matched as closely as subject major or minor availability permitted The Teaching Situation Reaction Test and the Dogmatism Scale were administered to all available student teachers. These tests were used as both dependent and independent variables. Data were analyzed using F-tests, and t-tests where applicable. Simple comparisons were also made.

Results. The student teachers trained with Flanders' coding of classroom techniques provided a more open classroom atmosphere.

The student teacher accepted more student ideas and praised them more, partly as a result, they criticized them less. The students talked considerably more and the teacher a little less. The amount of time devoted to content was the same, but it was used differently and the ratio of teacher to student talk was reduced.

The Dogmatism Scale was effective in predicting desirable change as measured by the Teaching Situation Reaction Test. Those people scoring high in flexibility and non-authoritarianism made significant growth while those judged authoritarian made little or no growth. The evaluation system used at Montana State University did not reflect these differences.

A COMPARISON OF THE VERBAL TEACHING PATTERNS OF TWO GROUPS OF SECONDARY STUDENT TEACHERS, MONTANA STATE UNIVERSITY, 1969-70

by

DENNIS LARRY MARTINEN

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree

of

DOCTOR OF EDUCATION

in

Secondary Education

Approved:

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MONTANA STATE UNIVERSITY
Bozeman, Montana

June, 1970

ACKNOWLEDGEMENTS

The writer wishes to express thanks to the many people who helped make this study possible. In particular the writer wishes to thank his major professor, Dr. Robert Van Woert, for his constructive suggestions and assistance. Gratitude is also expressed to the other members of the committee, Dr. Earl Ringo, Dr. Adrien Hess, Dr. Arthur McDonald, Professor Nathaniel Kutzman, and Dr. Max Amberson for their thought provoking questions and their constructive criticisms.

The writer also wishes to express thanks to all the secondary student teachers Fall Quarter, 1969, and Winter Quarter, 1970, for their cooperation. Without their cooperation the data for the study would be unattainable.

Sincere appreciation is also extended to Mrs. Barbara Kapinos and Mrs. Joyce Forsgren for their many instances of secretarial assistance.

Finally, the writer wishes to thank his wife, Kay, for her unswerving faith and loyalty. This support was a never ending source of strength that was extremely important to the writer.

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ABSTRACT

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Chapter 1

INTRODUCTION

Education, today, is a topic that is of vital interest to Montana, as well as the nation. Few people deny that the interactive process of teaching and learning is a complex one that makes scientific research difficult.

There is little doubt that scientific research has lagged in the analysis of the proper procedures for teaching. (Flanders, 1951) This lack of research is due to several reasons.

People concerned with research in education have found it difficult to develop reliable and valid instruments that can stand the test of replication. (Mitzel, 1960) To understand their difficulty, the subject must be understood. People are so highly complex and at times irrational, it is extremely difficult to predict their behavior. Research in science does not have this problem. A subject such as crystal, also highly complex, always reacts in a predictable fashion following the laws of nature.

Another problem in the analysis of the teaching pattern is the natural suspicion classroom teachers have for any kind of outside influence. This basic resistance to change was noted by such early psychologists as William James and Ivan Pavlov. (Hilgard and Bower, 1966)

Teaching is by nature a very personal process. The inner egos of both students and teachers are constantly exposed. Each party can hurt the other either intentionally or unintentionally. Much of the hurt and consequent withdrawal can be avoided with proper training of the teacher.(Flanders, 1951)

Some speak of the "born teacher" and his natural effectiveness with youngsters. It is wonderful to see such outstanding examples of teaching competency, but unfortunately, they don't seem to be born in sufficient numbers to fill all our classrooms.

For those people who are not born to teach, it is necessary to provide a program where they may attain the highest level of teaching competency possible before they are placed in teaching siutations and then they should be provided with the proper techniques and tools for continued self-analysis. It is only through constant work and vigilance that teachers can achieve and retain a high level of excellence.

Many institutions of higher learning offer teacher training programs. If these programs are to meet the challenges of the ever changing modern day student, the programs must be frequently evaluated an updated. Youngsters are changing and the program that trains their teachers must change with them or become increasingly less effective.

However, before one can look at possible avenues or directions of change, one must first determine a base line of present day performance. This study attempted to gather base line information on the present program, as well as explore areas of training never before offered at Montana State University.

Statement of the Problem

The problem in this study was to investigate the verbal teaching patterns of secondary student teachers and to determine essentially what these teaching patterns were. As a corollary to the problem, the Rokeach Dogmatism Scale and the Teaching Situation Reaction Test were administered to student teachers to determine if these tests could predict successful student teachers prior to their placement in the secondary schools of Montana.

It was the purpose of this study, then, to record and analyze the verbal behavior patterns of two groups of secondary student teachers. One group, the control group, consisted of students who went through the regular training program. The other group received twenty hours of training in interaction analysis. Selected aspects of the reconstructed Flanders' matrix were compared and analyzed. (Flanders, 1965)

Another aspect of the problem dealt with the possible predictive value of the Teaching Situation Reaction Test (Duncan with

Hough, 1966) and the Rokeach Dogmatism Scale (Rokeach, 1960) as they pertain to superior teaching. A comparison and analysis was made between scores achieved on the two tests and such quantitative elements as grade point average in the major and minor, grade point average in professional subjects, mean scores on the rating forms used by Montana State University supervisors and the grade given to measure the success in student teaching.

Need for the Study

A survey of available literature indicated that a relatively quantitative study of verbal teaching patterns of secondary student teachers had never been done at Montana State University, nor had the possible predictive aspects of the Teaching Situation Reaction Test and the Rokeach Dogmatism Scale been explored at this institution. Additional information is available in Chapter Two concerning the use of these instruments at other institutions.

The period of time when student teachers work actively in a classroom under the direction of a classroom teacher is often viewed by them as a culmination of their undergraduate college education. During a personal interview in January, 1970, Mr. G. V. Erickson, former Director of Student Teaching at Montana State University stated, "some student teachers fail because they are unable to master basic teaching competencies." These unfortunate incidents of failure can be reduced if more reliable instruments of selection can be developed.

In order to properly assess the excellence of any program, it must be analyzed in terms of its objectives. Presumably one of the measures of success for prospective teachers is the ability to obtain and hold a teaching job.

In a study by McMurchy (1969), the four-year education graduates of 1966, 1967, and 1968 were polled. Of the fifty-four percent who responded to the questionnaire, seventy-five percent of the 1966 graduates were still teaching and eighty-two percent of the 1967 graduating teachers were currently teaching. (McMurchy, 1969)

The student teachers that are graduates of Montana State University are successful; the records show this. They are able to obtain jobs and hold them, but what is really known about the teaching patterns of these people? Are some of them placed in positions that result in unhappiness for them and their students? The records show that this is also true. McMurchy noted that approximately three percent of those leaving teaching were doing so because of poor health, inability to keep discipline, or dislike for teaching (McMurchy, 1969, p. 60) If more were known about the kinds of teaching patterns student teachers possessed at graduation, some misplacement could be avoided. Not only could misplacement be avoided, but greater efforts could be made to teach the identifiable skills of superior student teachers to the students in training. Presumably the most critical measure of excellence for prospective teachers would be the creation of a classroom climate that would encourage every child to develop his abilities to the fullest extent possible. Studies will be cited in Chapter Three showing the relationship between teaching style and achievement. These studies will also show a relationship between teaching style and student attitudes toward peers and teachers. The time may well come when some teachers will not only be hired on the basis of subject content, but also on the basis of demonstrable skill they possess in direct or indirect teaching proficiencies.

As a result of this study, the College of Education at Montana State University will have on record the relatively quantitative teaching patterns exhibited by the twenty-two student teachers who were closely observed. The basic teaching pattern of each can be accurately re-constructed and evaluated, and decisions can be reached as to whether these patterns are desirable. This study should result in a greater understanding of the techniques our student teachers use.

Limitations of the Study

It is recognized that this study contains a number of variables that are impossible to control and yet could be a determining factor in the style of verbal interaction present in the classroom. Fortunately class size remained relatively constant, near an average of twenty-five students per class. However, such factors as the effects of the different cooperating teachers, ethnic and geographic location remain unassessed. In spite of the factors noted plus other equally potent variables, it was felt that information gained from a random sample of student teachers over a two-quarter period of time would be a valuable piece of data.

Another rather severe limitation was imposed on the study by the relatively short period of time (thirty teaching days) that the secondary student teachers spent in the classroom. During the Fall Quarter, two days of the thirty were school holidays. Of the remaining twenty-eight, the writer spent fifteen days with fourteen student teachers. Unfortunately, three of the fifteen days produced no usable information as the lessons presented were unsuitable to code.

Virtually all interaction presented on those observation days was coded. The matrices, later presented, are a fairly comprehensive version of one day's teaching.

The study is limited to those secondary student teachers selected at random Fall Quarter, 1969, and matched as closely as possible Winter Quarter, 1970, by those with appropriate majors and minors. The majors and minors considered were English, social studies, history, mathematics and biology since it was assumed that there would be more continual teacher-student interaction in these subject matter areas than in such subjects as physical education or industrial arts.

Definition of Terms

Secondary student teacher--Student enrolled in Education 410 and Education 411 at Montana State University and teaching in one or more of the grades seven through twelve in public schools of Montana.

Flanders' matrix--Ten by ten array of unit cells grouped according to rectangular coordinate system used in elementary mathematics systems. A more complete description of the categories, and cells, as well as the matrix is offered in Chapter Three.

Example

		1	2	3	4	5	6	7	8	9	10
Accepts Feeling	1										
Praises or Encourages	2										
Accepts or Uses Ideas of Students	3										
Asks Questions	4										
Lecturing	5										
Giving Directions	6										
Criticizing or Justifying Authority	7										
Student Talk - Response	8										
Student Talk - Initiation	9										
Silence of Confusion	10										

I/D ratio--Total of columns 1, 2, 3, 4 divided by the total of columns 5, 6, 7. (Amidon and Flanders, 1967, p. 131) This ratio compares the time spent praising or asking questions to the time spent lecturing, giving directions or offering criticism.

Revised I/D ratio (RID)--Total of columns 1, 2, 3, (kinds of praise) divided by the total of columns 6 and 7 (direction and criticism).

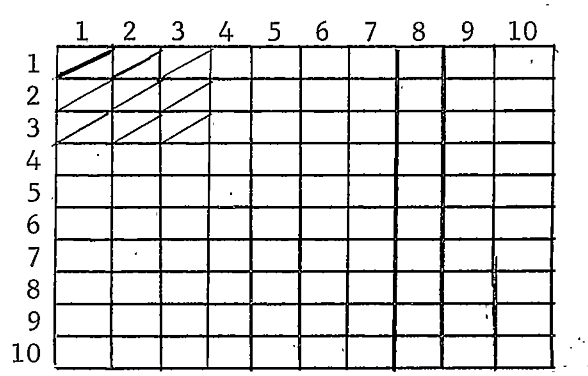
Teacher-talk--Total of columns 1, 2, 3, 4, 5, 6, 7.

Student-talk--Total of columns 8, 9.

T/S--Total of columns 8 and 9 divided into the total of columns 1, 2, 3, 4, 5, 6, 7.

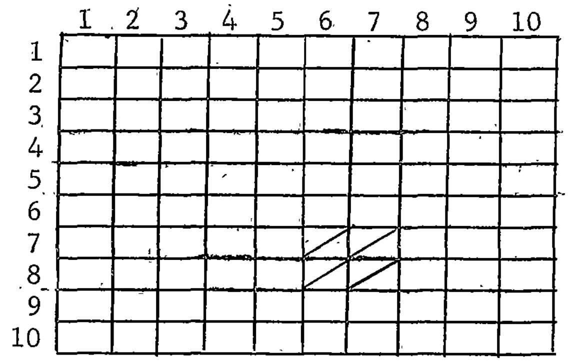
Extended indirect influence--Total of cells (1,1), (1,2), (1,3), (2,1), (2,2), (2,3), (3,1), (3,3), (3,3). These cells reflect the amount of time spent in different categories of praising the students.

Example



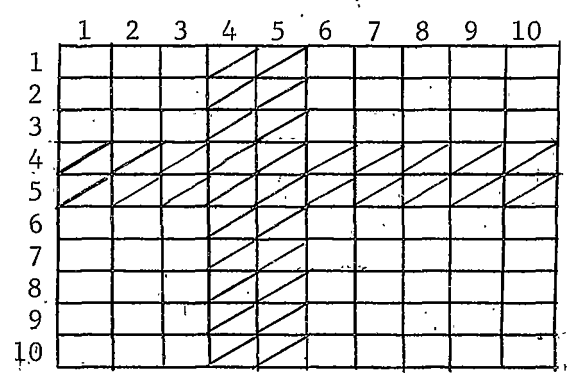
Extended direct influence--Total of cells (6,6), (6,7), (7,6), (7,7). These cells reflect the amount of time spent giving directions and criticism.

Example



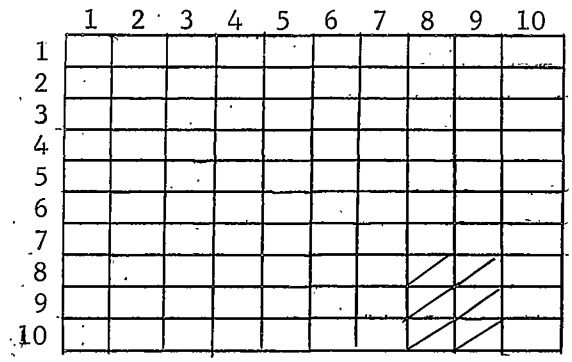
The "content cross"--Total of cells (1,4), (1,5), (2,4), (2,5), (3,4), (3,5), (4,1), (4,2), (4,3), (4,4), (4,5), (4,6), (4,7), (4,8), (4,9), (4,10), (5,1), (5,2), (5,3), (5,4), (5,5), (5,6), (5,7), (5,8), (5,9), (5,10), (6,4), (6,5), (7,4), (7,5), (8,4), (8,5), (9,4), (9,5), (10,4), (10,5). These cells carry the content covered in the teaching period.

Example



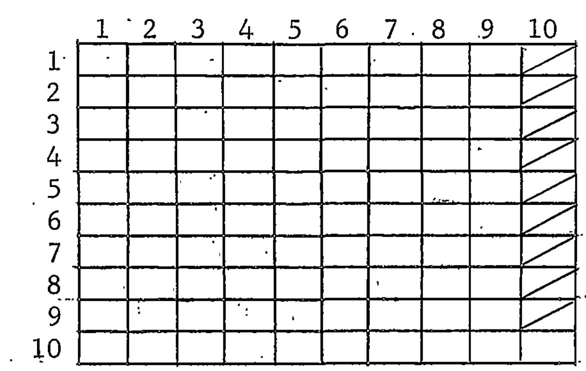
Student-talk following student-talk--Total of cells (8,8), (8,9), (9,9), (10,8), (10,9).

Example



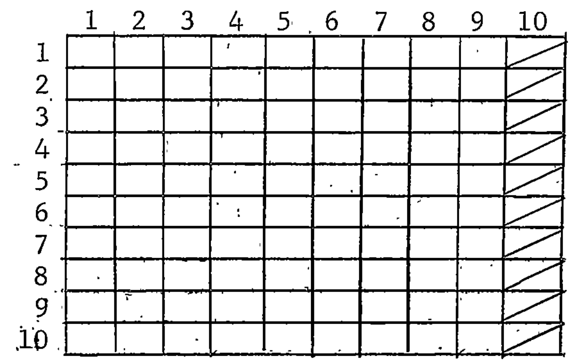
Silence or confusion following teacher-talk or student-talk--Total of cells (1,10). (2,10). (3,10), (4,10). (5,10), (6,10), (7,10), (8,10), (9,10).

Example



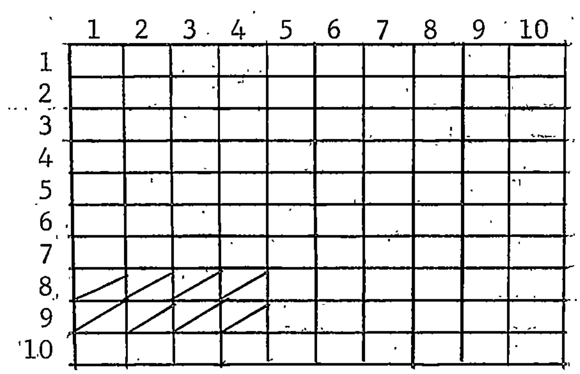
Total silence or confusion--Total of cells (1,10), (2,10), (3,10), (4,10), (5,10), (6,10), (7,10), (8,10), (9,10). (10,10).

Example



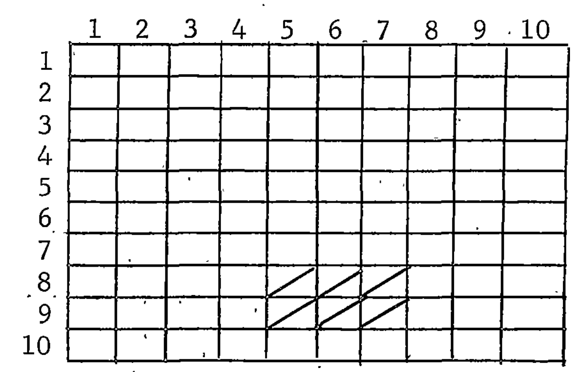
Indirect teacher response to student comments--Total of cells (8,1), (8,2), (8,3), (8,4), (9,1), (9,2), (9,3), (9,4).

Example



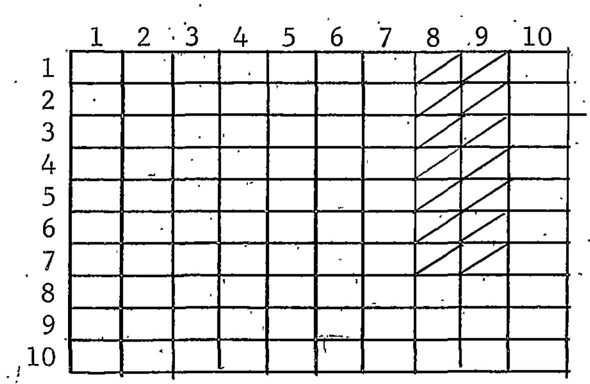
Direct teacher response as a result of student comments--Total of cells (8,5), (8,6), (8,7), (9,5), (9,6), (9,7).

Example



Student-talk following teacher-talk--Total of cells (1,8), (1,9), (2,8), (2,9), (3,8), (3,9), (4,8), (4,9), (5,8), (5,9), (6,8), (6,9), (7,8), (7,9).

Example



Summary

The availability of research information about the verbal teaching patterns of the secondary student teachers at Montana State University was explored and its lack was noted. It was the problem of this study, then, to investigate the verbal teaching patterns of selected secondary student teachers and to determine essentially what these teaching patterns were. As a corollary to the problem, the <u>Rokeach Dogmatism Scale</u> and the <u>Teaching Situation Reaction Test</u> were administered to student teachers to determine if these tests could predict successful student teachers prior to their student teaching experience in the secondary schools of Montana. The Flanders' system of recording and analysis was used to investigate the verbal teaching patterns of the student teachers.

Chapter 2

REVIEW OF LITERATURE

In reviewing the literature, two basic categories were covered: (1) literature pertaining to interaction analysis, and (2) literature pertaining to the information gathering instruments. The information gathering instruments included: (1) Flanders' system of coding classroom behavior; (2) Teaching Situation Reaction Test; and (3) Rokeach Dogmatism Scale.

Early Studies of Teacher-Student Interaction

Some of the earliest studies regarding a type of interaction of students and teachers stems from the work of H. H. Anderson and his associates, Joseph and Helen Brewer and Mary Frances Reed. (Anderson, 1939) These studies and later ones tended to polarize human contacts as either "dominative" or "integrative" contacts. Since most research on classroom climate tends to dwell in these areas it is essential that they be understood.

Early researchers thought of these two kinds of behavior in this way.

> A preliminary study showed that it was possible to devise reliable measures of behavior of young children. Behavior was recorded as "contacts" divided into two groups of categories. If a child snatched a toy, struck a playmate, or commanded him, or if he attempted to force him in some way, such contacts were included under the term "domination". By such behavior he ignored the rights of the companion; he tended to reduce the

interplay of differences and to lead toward resistance or conformity in responding or adapting to another.

Other contacts were recorded which tended to increase the interplay of differences. Offering a companion a choice or soliciting an expression of his desires were gestures of flexibility and adaptation. These tended in the direction of discovering common purposes among differences. Such contacts were grouped under the term "socially integrative behavior". (Anderson and Reed, 1946, p. 5)

Anderson's work was based primarily on youngsters in the pre-school and elementary stage of development. It involved five different teachers over a period of several years. Over a period of time, certain consistent findings appeared. One of the most significant findings related to the behavior of the teacher as it set the climate for the class. Dominative contacts by the teacher spread further dominative contacts throughout the room, while integrative contacts cited further integrative contacts. This tendency persisted when the teacher no longer was present in the room. A second significant finding concerned those teachers with a high proportion of integrative contacts. Pupils in this setting were more spontaneous, showed more initiative and exhibited more acts of problem solving. (Anderson, 1939)

A third finding by Anderson and Reed (1946) showed that students with a high proportion of dominative contacts were easily distracted and showed greater rejection of teacher domination.

A second early study done by Lippitt and White (1943) made an independent analysis of the effect of adult leaders on boys' groups. This study was done under more closely controlled laboratory conditions. The role of the adult leaders was made more consistent as a result of careful training and role playing. The basic differences evolving from different personalities were minimized by rotation of leaders among the groups. To intensify the effect of the adult leaders, the groups were kept at five boys. The experiments of Lippitt and White contained some slight variations when compared to the work of Anderson. Essentially though, Lippitt and White used "authoritarian leadership" as the integrative contact; and "laissez-faire" as a pattern of infrequent integrative contacts mixed with an element of indifference to the rest of the group. This latter pattern is seldom found in the classroom and Anderson and others did not consider it in their studies.

A most interesting aspect of this second independent study concerns its relationship to the work by Anderson. With some changes in semantics, but with virtually no changes in behavioral actions the two studies are mutually supportive. One interesting facet of Lippitt and White involved a conceptual extension of Anderson's "conforming to teacher domination." Under the more intensive social climate of the laboratory it was readily seen that extensive compliance by youngsters occurred if a generalized condition of dependence was maintained. (Lippitt, 1940)

These two supportive studies resulted in several other studies concerning the social climate of the classroom. In a study by Withall (1949) a seven category system of integrative-dominative behavior gave results similar to Anderson's. In an early study by Flanders (1951) youngsters were exposed to contrasting patterns of teacher behavior one pupil at a time. Flanders noted that the dominative pattern was consistently disliked by the youngsters. The dislike was measured in terms of inability to recall information; anxiety as measured by the galvanic skin response and changes in the heart beat. All three indicators showed positive gains when integrative contacts were used.

A study by Perkins (1951) supported the general theme of greater learning brought about by an integrative type of leader. Cogan (1956), in a large cross-sectional study involving 987 eighth grade students in 33 classrooms had a similar finding. Cogan did not use a system of spontaneous observations as did Perkins and Withall, but a pencil and paper type instrument that assessed (a) student perceptions of the teacher; (b) how often they did required homework; and (c) how often they did non-required homework. Cogan found that they did more required and non-required homework when they, the students, perceived the teacher as an integrative type rather than a dominant type.

These research projects cited all support the notion of the importance of classroom climate. A summarization of the two types of teaching patterns follows:

The Integrative or Indirect Pattern

(a) Accepts, clarifies, and supports the ideas and feelings of pupils.

(b) Praises and encourages.

(c) Asks questions to stimulate pupil participation in decision-making.

(d) Asks questions to orient pupils to school work.

The Dominative or Direct Pattern

(a) Expresses or lectures about own ideas or knowledge.

(b) Gives directions or orders.

(c) Criticizes or deprecates pupil behavior with intent to change it.

(d) Justifies own position or authority. (Flanders, 1965, p. 6)

Recent Studies of Teacher-Student Interaction

The year 1956-57 is taken as an arbitrary point to distinguish studies of two periods. It was at this point that Flanders first used the notion of a matrix in his analysis of data.

In a study done in New Zealand in 1956-57, Flanders (1965) found a significant relationship between attitudes of elementary youngsters and teaching style exhibited by the teacher. It was shown that:

> ....classes that scored high on liking the teacher, motivation, fair rewards and punishments, lack of anxiety, and independence used more indirect influence, while teachers of classes that scored low used less indirect influence. (Flanders, 1965, p. 64)

A concurrent study done in Minnesota also confirms this. (Flanders, 1965)

Table 1 gives the interaction analysis data for the five high and low scoring attitude classes in New Zealand. The subjects were standard 4 youngsters, 10 to 12 years old. (Flanders, 1965, p. 57)

TABLE 1

INTERACTION ANALYSIS DATA FOR NEW ZEALAND STUDENTS

		Category in Percent Type of Class	
		Highest	Lowest
Accepts and clarifies feelings	1	0.41	0.05
Praises and encourages	2	2.28	0.09
Accepts and clarifies student ideas	3	6.28	2.89
Asks questions	4	8.71	5.85
Routine administration or statements unrelated to learning	5	0.40	0.67
Gives information or lectures	6	24.15	25.40
Gives direction	7	9.58	16.50
Gives criticism	8	2.58	6.31
Justifies own authority	9	31.52	20.35
Pupil talks	10		
Silence, pauses or confusion	11	13.71	19.99
Total Tallies		10,769	29,054

A third study in Minnesota involved seventh grade social studies and eighth grade mathematics classes. The general results are consistent with those studies cited previously, i.e., those teachers using indirect teaching patterns stimulated greater achievement than those who were more direct. In fact, it was found that "direct teacher influence restricts learning when a student's perception of the goal is ambiguous."(Flanders, 1965, p. 108)

In an intensive study conducted by Norma Furst and Edmund Amidon at the elementary level, variation in verbal communication was noted in grade level and subject taught. The schools involved were divided by economic level; low, medium or high. At least twenty-five classrooms were involved at each level. Table 2 is a description of talk by grade level.

TABLE 2

TALK BY GRADE LEVEL

Grade	Teacher Talk Percentage	Student Talk Percentage	Silence Percentage
1	47	32	21
2	41	42	17
3	42	40	18
4	49	39	12
5	47	29	14
6	47	35	16

(Furst and Amidon, 1965)

The results of the study show that primary teachers used a large amount of time in question and answer sessions while the intermediate teachers appeared to feel that more extensive lecture was conducive to learning. In the upper grades more time was given to independent work by the student.

In Table 2 the column under silence is fairly constant, but an analysis of the matrix reflects different kinds of silence. In the lower grades silence was recorded as a result of changing seats, opening books or a general change of activity. In the upper grades large blocks of silence reflected more extensive seat work.

Praise is used rather extensively at the elementary level and it is interesting to note in this study that it was used most persistently by the first and fifth grade teachers. Variation in techniques of subjects was also apparent. Either by design or accident teaching of social studies was more indirect than teaching of reading or arithmetic. The amount of talk initiated by the students was at its lowest level in grade one, but in grade six it had increased by a factor of ten.

It is apparent from this examination of the material cited that different teaching styles can be identified by grade level, but underlying the grade level differences one still finds the consistent results first noted by H. H. Anderson thirty years ago.

No one in education today believes that all students are alike. Some would argue that it is folly to expect that any single method would be effective with all students, and rightly so. Certainly, thought and research need to be done in the area of pupil personality as it meshes with teacher methods and goals.

A study by Amidon and Flanders explores this area. The study revolved about four treatments done to four different groups of students by a single teacher. The treatments included:

(1) Direct teacher influence: clear goals, 35 dependent-prone students.
(2) Direct teacher influence: unclear goals, 35 dependent-prone students.
(3) Indirect teacher influence: clear goals, 35 dependent-prone students.
(4) Indirect teacher influence: unclear goals, 35 depen-dependent-prone students. (Amidon and Flanders, 1961)

The 140 students were selected on the basis of scores of a dependence proneness test developed by Flanders, Anderson and Amidon. They consisted of the top 25 percent of a larger group of 540 students selected at random.

An examination of Table 3 shows that the single teacher was able to alter his behavior effectively. This was noted in the amount of the category represented under the various treatments.

The results of the study are especially interesting. First, no significant difference was found in achievement whether the groups understood the goals or not. Second, it was found that those students in the indirect group scored significantly higher than those in a direct group upon a post examination. This second conclusion has many meaningful connotations. This is especially true when further study shows that as youngsters show more independence these differences of indirect versus direct become less significant.

TABLE 3

PERCENTAGE OF TALLIES OF INTERACTION CATEGORIES

Category Definition	Treatment 1	2	3	4
Teacher Talk: Praise and encouragement	1.35	1.61	27.04	24.90
Clarification and development of ideas suggested by students	2.48	0.92	15.78	16.10
Asks questions	2.58	1.73	28.07	30.04
Gives own opinion and facts (lectures)	63.10	61.40	13.52	15.97
Gives directions	8.67	10.36	0.28	0.27
Criticizes students	13.03	15.54	1.27	0.94
Student talk	5.07	5.29	16.47	17.17
No one talking	3.49	3.45	7.75	4.69
Total tallies on which the percentage figures are based	889	869	711	746

When youngsters scoring in the top 25 percent of independence are used, no significant difference results. When compared to the total sample of students the more dependent prone student is more influenced by the teaching pattern.

Studies have been done at various levels and content areas comparing the verbal behavior patterns of superior teachers with those judged not as proficient. One study done by Amidon and Giammateo (Amidon and Hough, ed., 1967) involved 153 elementary teachers from eleven districts. This group included thirty-three teachers identified as superior by their administrators or supervisors and 120 for the normative group selected at random.

The results of analyzing the Flanders Matrix indicate that

> ....the superior teachers talked approximately 40% of their total class time while the normative group talked approximately 52% of the time. The superior teachers were more accepting of student-initiated ideas, tended to encourage these ideas more and also made more of an effort to build on these ideas than did the average group of teachers. The superior teachers dominated their classrooms less, used indirect verbal behavior more, and used direction-giving and criticism less than the normative group of teachers. The superior teachers asked questions which were broader in nature than the normative group, and their lectures were interrupted more by questions from the students. There was about 12% more participation in the classes of the superior teachers. (Amidon and Hough, ed., 1967, p. 187-188)

One might tend to dismiss this study on the basis that it simply shows that administrators and supervisors tend to pick certain kinds of teachers as superior. The concept of a superior teacher and teaching must be identified in more objective terms. If superior teaching is linked with greater achievement by students on standardized achievement tests and more positive attitudes towards others in their peer groups, then studies are available to supply relatively objective information about superior teaching. Several examples will be cited.

Nelson (1966) did a study on the elementary level. She found a positive or favorable relationship between indirect teacher influence and inhibition of students development of written language skills.

Furst (1965) also identified certain relationships between teacher influence patterns and student achievement at the elementary level. She also concluded that there was a positive relationship between amount of talk and student achievement.

La Shier (1966) found that students working with indirect student teachers achieved more than students working with direct student teachers. This study covered a six week unit in biological science.

Soar (1966) found similar conclusions at the elementary level in a reading comparison. A particularly interesting facet of Soar's study concerned reading growth in the summer period. Those students who had direct teachers during the regular year advanced three months in reading comprehension while those who experienced the indirect influence made a five and one-half month advance in reading comprehension. This seems to indicate that the indirect teacher has an influence after the formal learning situation ceases.

The whole problem of achievement can be related to the student's sensitivity to the teacher as an authority figure. If the teacher is directive the student finds increasing satisfaction in compliance to authority and his understanding of the subject can decrease as the course progresses. Only if a climate of reassurance, freedom and respect for human dignity is maintained does such a youngster do as well as he is able.

> One implication of this study is that closer supervision through the use of direct influence, an all too common antidote to lower achievement, may be more harmful than helpful for dependent-prone students.(Amdion and Flanders, 1969, p. 291)

This last statement is especially important because it implies that a youngster's development is being retarded while it is supposedly being stimulated. Those who already may have a weak desire for education may find it further extinguished by remedial programs.(Amidon and Flanders, 1961)

The above quotation also has implications for grouping and teacher selection. The time appears to be past when grouping of youngsters can take place on the basis of age, sex, or I.Q. and the teacher selected solely on the basis of subject content. Now it becomes increasingly apparent that personality factors in students and verbal teaching patterns of teachers must also be matched to bring about the desired behavioral change in youngsters. (Amidon and Flanders, 1964)

At the present time no national averages are available which represent hard and fast rules as to what is "desirable" or "undesirable" in the classroom. Probably the person most able to make the final decision is the individual teacher. It is possible, in a general way, to discuss the implications of the reconstructed matrix.

Some data are cited below to give the reader some insight into average percentages available on experienced junior high teachers. These figures represent current practices and not necessarily the best practices. The actual number of teachers involved in this part of the study was not available, but these figures were a result of early research at the University of Minnesota and later research at Temple University.

Statements that belong to category one, accepts feeling, are seldom used, but due to the nature of what they portray, are considered valuable indicators of the nature of the climate in the classroom. The average amount of time spent in this category is less than .5 percent. There appears to be little difference in the use of this category by indirect teachers as compared to direct teachers. It has been found that indirect teachers use up to .5 percent while direct teachers usually use less than .1 percent. These differences in amounts were considered minimal in the context of total class time. (Amidon and Flanders, 1967)

Little difference is found between the number of times the indirect teacher uses category two, praises or encourages, as compared to the direct teacher. Both use it about 2 percent of the total class time. However, the (2,2) cell, indicating extended praise, is used about twice as much by the indirect teacher as the direct teacher.

In category three, accepts or uses ideas of students, there is a striking difference between the indirect as compared to the direct. Approximately two percent of the time is utilized by direct teachers, while indirect teachers use it about 9 percent of the time. Although some difference in usage is due to subject content, large cross-sectional studies indicate that it is largely due to teacher differences rather than subject area. (Amidon and Hough, 1967) In particular, it is felt that extensive use of the (3,3) cell is a reliable indicator of the indirect teacher. (Amidon and Hough, 1967)

There seems to be little difference in the use of categories four and five as used by indirect and direct teachers. Category four, teacher questions, is used about 8 percent of the time by the direct teacher, while the indirect teacher uses it about 11 percent of the time. Category five, lecture, varies from 25 to 50 percent of the time with little consistency in determining the direct or indirect teacher. (Amidon and Flanders, 1967)

Category six, giving directions, involves a significant difference in the use of time spent by the two kinds of teachers discussed. The direct teacher is involved in giving directions 8 percent of the time while the indirect teacher is involved 4 percent of the time.

Category seven, criticizing or justifying authority, also involves differences in teaching style. The direct teacher uses criticism or self-justification about 5 percent of the time, while the indirect teacher uses it less than 1 percent of the time.

A basic difference in category eight, student talk-response, is noted in how students are permitted to talk. The direct teacher is marked by about 50 percent of the tallies in the (4,8) cell, while the indirect teacher is identified by about 30 percent of the tallies there. The indirect teacher has a much heavier loading in the (8,8) cell, indicating more lengthy response to the teacher question. (Amidon and Flanders, 1967)

The same kind of pattern also occurs in category nine, student talk-initiation, indicator of the indirect teacher is the large number of tallies in the (9,9) cell. This category will run as high as 10 percent or more of the classroom time for some teachers.(Amidon and Flanders, 1967)

Category ten, silence or confusion, shows a heavier loading for direct teachers as compared to indirect teachers. Ten percent of the time spend in silence and confusion was considered average in a study done with student teachers by Lohman, Ober, and Hough.(Amidon and Hough, eds., 1967)

Predictive Studies Involving Validity of the *Teaching Situation Reaction Test*

Several studies have been done using the *Teaching Situation Reaction Test* as a predictor of student teaching success. One of the first studies involved seventy-three science student teachers at The Ohio State University, Columbus, Ohio. The basic null hypothesis stated that there was no relationship between the grades in student teaching and scores achieved on the T.S.R.T. A tetrachoric r value of .51 resulted. This value is significant beyond the .01 level. Therefore, it was concluded that the T.S.R.T. had some value in predicting student teacher grades.(Duncan with Hough, 1966)

Another study involved forty-eight student teachers at Keene State, Keene, New Hampshire. Two supervisors ranked the top ten student teachers and the eleven who were deemed the poorest. It was hypothesized that there was no difference in the average score achieved on the T.S.R.T. Using a _t_ value with nineteen degrees of freedom, results were significant at better than the .05 level.(Duncan with Hough, 1966) Once again, the T.S.R.T. exhibited potential for predicting success in student teaching.

A third study involved seventy experienced teachers in a single school system. Two supervisors ranked the nineteen best teachers and nineteen poorest teachers. It was hypothesized that there would be no difference in the average score of the two groups. A _t_ test was applied and results were significant beyond the .01 level.(Duncan with Hough, 1966)

Studies Involving Reliability of the _Teaching Situation Reaction Test_

One study concerned with the reliability of the T.S.R.T. involved eighty-four student teachers at The Ohio State University. A test-retest situation with an intervening interval of eighty days resulted in a product moment correlation of .84. This value indicates a good degree of reliability.(Duncan with Hough, 1966)

Two studies have been done involving fake resistance. Both studies resulted in the same conclusions. Undergraduate students were unable to fake results to get a "good" score. (Duncan with Hough, 1966) According to the studies cited the T.S.R.T. appears to have good reliability and validity in predicting student teacher success.

Studies Involving the Rokeach Dogmatism Scale

The Dogmatism Scale is a result of the work of Dr. Milton Rokeach and his associates. Essentially the test is a measure of general authoritarianism and general intolerance. (Rokeach, 1960)

Table four shows the general development of the test and the search for test reliability. This table shows the development of five forms of the test and the good reliability when the test is used in different geographic regions. This table is, in general, restricted to university students.

A second study by Rokeach found a positive relationship between the selection of groups by peers and scores on the Dogmatism Scale. This and other studies are discussed in Rokeach. (1960)

Hough and Amidon (1964) explored the possible link between scores on the Dogmatism Scale, and successful experience in student teaching. They found that students with relatively low scores on the Dogmatism Scale were seen by their supervisors as more effective teachers. They suggest a link between the Teaching Situation Reaction Test and the Dogmatism Scale. (Hough and Amidon, 1964)

Zahn (1965) also explored the relationship between proficiency in teaching and scores achieved on the Dogmatism Scale. He found that student teachers who scored one standard deviation below the mean (more open belief system) were more proficient in

TABLE 4

RELIABILITIES, MEANS AND STANDARD DEVIATIONS
OF SUCCESSIVE FORMS OF THE
DOGMATISM SCALE

Form	No. of items	Group	No. of Cases	Reliability	Mean	S.D.
A	57	Mich. State U., I	202	.70	182.5	26.2
B	43	New York Colleges	207	.75	141.4	27.2
C	36	Mich. State U., II	153	.73	126.9	20.1
		Mich. State U., III	186	.71	128.3	19.2
		Purdue U.	171	.76	---	--
D	66	English Colleges I	137	.91	219.1	28.3
E	40	English Colleges II	80	.81	152.8	26.2
		English Workers	60	.78	175.8	26.0
		Ohio State U., I	22	.85	142.6	27.6
		Ohio State U., II	28	.74	143.8	22.1
		Ohio State U., III	21	.74	142.6	23.3
		Ohio State U., IV	29	.68	141.5	27.8
		Ohio State U., V[a]	58	.71	141.3	28.2
					143.2	27.9
		Mich. State U., IV	89	.78	---	--
		V. A. Domiciliary	80	--	183.2	26.6
			24	.93	---	--
			17	.84	---	--

[a]The Ohio State University V reliability was obtained by a test-retest, with five to six months between tests. The reliability of .84 for the V.A. group was obtained in the same was with at least a month between tests. (Rokeach, 1960, p. 90)

their student teaching performance. One of Zahn's indicators of performance was the Teaching Situation Reaction Test.

In his analysis of validity, Rokeach used groups chosen on the basis of open or closed belief system as they appeared to others. A comparison of the scores of these known groups established a general relationship between the known group and the score on the Dogmatism Scale. (Rokeach, 1960)

It is interesting to note the failure of one of the first experiments. College professors were asked to select from among their graduate students groups that were relatively open and groups relatively closed. Scores achieved by these groups as measured by the Dogmatism Scale were not significant. It is possible the college professors were poor judges of character or simply did not know the graduate students well enough. Another alternative could be the professor-student relationship produces a masking effect by the student. As Rokeach points out "there is little room for arrogance, bigotry, or cocksureness in dealings with professorial authority." (Rokeach, 1960, p. 106)

Summary

As one reads the literature available linking teaching style and achievement, the consistency of the studies tends to emphasize the importance of teaching style as it relates to student achievement as well as student attitudes. The general teaching style which stresses maximum student involvement and warm acceptance of the students as a worthwhile human being seems to bring significantly greater benefits in the form of greater achievement and better attitudes with less measurable stress on the students. If one accepts the rather consistent findings, then it behooves one to bring about the kinds of teaching behavior in student teachers deemed desirable.

Both the Teaching Situation Reaction Test and the Dogmatism Scale have been used before with good results in predicting student teacher success. Validity and reliability for both instruments have been explored and found.

Chapter 3

METHOD

The purpose of this chapter is to describe the groups of student teachers involved in the study as well as the instruments used to collect the data.

Selection and Description of the Control Groups

There were a total of 80 secondary student teachers involved initially with this study Fall Quarter, 1969. This group was reduced to 77 because of the failure of people to properly follow directions on the initial information gathering instrument. This group will hereafter be referred to as "Group A". Of this group, all those people teaching in the subject areas of English, social studies, mathematics, and science were placed in a sub-group referred to as "Group B". Group B consisted of 37 people. These areas were picked to restrict the study and lend greater homogeneity to the group involved. It was also felt that there would be more teacher-student interaction in these subject matter areas than in such subjects as physical education or industrial arts.

From the people in Group B fifteen names were selected on a random basis by lottery as described by Cochran (1953) and Weinberg and Schumaker (1962). This group will be referred to as "Group C".

There will be no "Group D" in this study. "Group E" was chosen to represent the experimental aspect of this study.

Selection and Description of the Experimental Group

There were a total of 33 secondary student teachers involved with the student teaching experience Winter Quarter, 1970. Thirty-two of these were involved in the study. This group will hereafter be referred to as "Group E". Of this group, all those people teaching in the subject areas of English, social studies, mathematics and science were placed in a sub-group referred to as "Group F". No further reduction of Group F was necessary as it contained the desired number to match Group C in the control group.

Instruments Used in the Study

The following is a description of the instruments used to collect data for the study.

Teaching Situation Reaction Test (TSRT).

As the name of the test implies, the student is faced with a teaching situation and asked to respond to it by ranking four possible courses of action. The ranking is done in accordance with four theoretical dimensions:

> (a) the type of control a teacher would use in the classroom, direct or indirect; (b) the relationship the teacher would have with students in the classroom, empathetic or self-oriented;

> (c) the approach the teacher would take to classroom problems of instruction and control, objective or subjective; and (d) the approach the teacher would have to classroom methodology, experimental or conservative. (Hough and Amidon, 1964, p. 22-23)

The situations are of such a nature that they may be considered subject matter neutral. The situations deal with such items as teacher planning, management in the classroom and teacher-pupil relationships. There are forty-eight items in the test. (Duncan with Hough, 1966)

The general situation posed to the individual taking the test is essentially this:

> You have been employed by a school system which is engaged in a series of experimental studies. One of these studies involves a class designed to improve pupils' general adjustment to their environment. A heterogeneous group (physically, mentally, socially) of twenty-five thirteen to fourteen year-old youngsters have signed up for this class entitled "Teen Topics" because they thought it would be interesting.
>
> The class is scheduled to meet the last period of the day on Tuesday and Thursday during the second semester. Arrangements have been made so that the class might take trips and students might meet informally with the teacher after class.
>
> You have accepted the principal's invitation to take this class. You have been given pretty much of a free hand to develop the course. You have a teacher-counselor to help you and a good supply of instructional materials available. Studies will be made of the personal adjustment gains evidenced by a selected number of your twenty-five students. (Duncan with Hough, 1966, p. 3)

The foregoing statement describes the general situation. Eleven modifications are posed to the testee. The modifications include situations dealing with "course planning, handling restlessness and inattention, handling conflict between two students, handling conflict between a student and the class as a whole, working with shy students and many others."(Duncan with Hough, 1966, p. 3) A copy of this instrument is included as Appendix A.

Rokeach Dogmatism Scale.

The Dogmatism Scale used in this study was developed over a period of years by Milton Rokeach and has associates. The test measures essentially the openness or closedness of a person's belief-disbelief system, which, as Rokeach defines the terms, really measures general authoritarianism and intolerance. The various forms and development of the test are discussed in *The Open and Closed Mind*.(Rokeach, 1960) Form E of the Dogmatism Scale was used and it is included in Appendix B.

Supervisor's Report on Student Teaching.

This is a check-list form used by Montana State University supervisors. It contains five categories ranging from "1" being superior to "5" being poor. There are three general headings. They include (1) personal characteristics; (2) teaching characteristics; and (3) professional attitudes. This form is used primarily for conferences between college supervisors and student teacher. It is included in Appendix C.

Classroom Teacher's Evaluation of Student Teachers.

This is a second check-list form used by the classroom teacher. It also consists of a five category checklist ranging from "1" being superior to "5" being poor. The evaluation form is included in Appendix D.

Flanders' System of Interaction Analysis.

The Flanders' System of coding verbal interaction between teacher and student involves ten categories. These categories include: (1) accepts feeling; (2) praises or encourages; (3) accepts or uses ideas of students; (4) asks questions; (5) lectures; (6) gives directions; (7) criticizes or justifies authority; (8) student talk-response; (9) student talk-initiation; (10) silence or confusion. A trained observer records an appropriate number every three seconds. Additional information about the categories is included in Appendix E. Information concerning the ground rules of coding can be found in Amidon and Flanders, pages 24-29 (1967). As an example, ground rule 13 is cited. "Rhetorical questions are not really questions; they are merely part of lecturing techniques and should be categorized as 5's."(Amidon and Flanders, 1967, p.29)

After a minimum of four hundred entries describing the various categories were recorded, an appropriate ten by ten matrix is constructed and analyzed. An example of how the matrix is constructed follows:

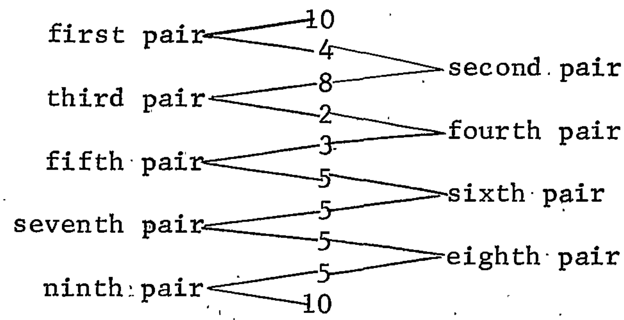
A trained observer may record the following sequence as a result of classroom observation:

4
8
2
3
5
5
5
5

For the purpose of analysis a ten would be placed at the beginning and ending of the sequence giving this appearance. The tens are used to balance the matrix as it is assumed that each recording period began and ended in silence.

10
4
8
2
3
5
5
5
5
10

The tabulation involves every adjacent pair of numbers.



The first pair is plotted as row ten, column four. The second pair is plotted as row four, column eight. The third pair is plotted as row eight, column two. This continues until all adjacent pairs are plotted.

A sample matrix follows below:

TABLE 5

SAMPLE INTERACTION MATRIX

Columns

	1	2	3	4	5	6	7	8	9	10	
1											
2			1								
3					1						
4								1			
5					3					1	
6											
7											
8		1									
9											
10				1							
Total	0	1	1	1	4	0	0	1	0	1	9

In table 5, cell (4,8) represents a shift in verbal behavior from teacher question to student response. Cell (8,2) represents a shift from student response to teacher praise. Following this kind of procedure percentages of different kinds of teacher-student talk can be determined and teacher styles and classroom climate can be assessed.

Description of the Study

All groups were given the Teaching Situation Reaction Test prior to student teaching and again on a post-test basis immediately following student teaching. The Dogmatism Scale was administered to both the Fall Quarter group of student teachers and the Winter Quarter group at the same time to preserve the validity of the test. Both the Dogmatism Scale and the pre-test of the Teaching Situation Reaction Test were administered to the experimental Group F prior to receiving the additional Flanders' training.

Of the fifteen people originally selected in experimental Group C, one was later excluded because of an assignment error, and two more were excluded because of insufficient data received as a result of coding. This left a group of twelve for close scrutiny by the writer, using Flanders' methods of coding and analysis.

The twelve students were assigned to various schools throughout the state of Montana using normal college rules for assignment. There is no reason to suspect any systematic bias in the assignment procedures.

The experimental group (Group F) of eleven student teachers was selected by the writer on the basis of subject major and minor areas as closely as availability permitted. The writer gave the eleven student teachers twenty hours of training with the Flanders' method of coding interaction analysis. Emphasis was given equally to coding and interpretation of the reconstructed matrix. Some "live" coding was done by the students on each other. The majority of coding revolved around two training tapes purchased from the Association for Productive Teaching, Minneapolis, Minnesota. The text used was <u>The Role of The Teacher in the Classroom,</u> revised edition by Edmund J. Amidon and Ned A. Flanders.

Class attendance remained high in spite of meeting two hours per night on consecutive nights of the week. The students made frequent suggestions for inclusion of this experimental class into the regular education program at Montana State University.

Following this training, Group F taught Winter Quarter, 1970. The writer observed and coded them using the procedures followed by Flanders.

A descriptive analysis was made on pertinent areas of the reconstructed matrix of experimental Group F as compared to control Group C. No statistical tests were performed on mean scores of areas of the matrix following the wishes of the writer's graduate committee.

Statistical tests were performed on the various sub-groups using the Dogmatism Scale, the pre-test of the Teaching Situation Reaction Test and grades in the student's major areas as indicators of likeness or unlikeness prior to student teaching. The Fisher F-test with the criterion being $F^{n-1}_{n-2} \geq \frac{S_1^2}{S_2^2}$

was used to determine the homogeneity of the two population variances. Following this the appropriate t test was used to test the significance of the means under investigation. The procedure used was outlined in Educational Statistics by W. James Popham. (1967)

The predictive aspects of the Dogmatism Scale and the Teaching Situation Reaction Test were also explored. Both were used as independent and dependent variables. These results were compared against the grades given in student teaching and the mean score achieved on the college supervisor's evaluation form. (Appendix C) The F and t tests were used to test homogeneity of variances and equality of means, respectively.

The Pearson r correlation was used to determine the degree of correlation between the average score achieved on the college supervisor's form (Appendix C) and the classroom teacher's evaluation form (Appendix D). The formula used is given below:

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{n}}{\sqrt{\left(\Sigma X^2 - \frac{(\Sigma X)^2}{n}\right)\left(\Sigma Y^2 - \frac{(\Sigma Y)^2}{n}\right)}}$$

The process of selection of the different groups involved in the predictive aspects of the Dogmatism Scale and the Teaching Situation Reaction Test are described in Chapter Four.

Summary

The various groups and sub-groups of student teachers involved in the study were identified. Procedures of random selection were noted and documented.

The instruments used in the study were identified and described. These instruments included: (1) the Teaching Situation Reaction Test, (2) the Rokeach Dogmatism Scale, (3) Supervisor's Evaluation of Student Teachers, (4) Classroom Teacher's Report on Student Teaching, and (5) Flanders' System of Interaction Analysis.

The Teaching Situation Reaction Test has been used at other institutions to predict those who will be successful teachers. It consists of forty-eight forced-choice response items. By ranking these responses the testee indicates how he would respond to a series of educational situations.

The Rokeach Dogmatism Scale attempts to determine the relative openness of closedness of a person's belief-disbelief system. The use of this test has been successfully linked with the Teaching Situation Reaction Test.

The Supervisor's Evaluation of Student Teachers is a checklist form of student teacher evaluation. The Classroom Teacher's Report on Student Teaching is a similar checklist form used by the classroom teacher.

The Flanders' System of Interaction Analysis includes ten categories. The identity and use of these categories were explained. The rudimentary rules of the reconstructed matrix were also included.

The various statistical instruments used in the study were identified. Statistical source books were noted.

Chapter 4

PRESENTATION AND ANALYSIS OF THE DATA

This area of the study will first explore the possible predictive value of the Dogmatism Scale and the Teaching Situation Reaction Test as they pertain to success in student teaching as viewed by the college supervisor. Both tests will be used as both dependent and independent variables.

The first portion of this study that deals with the predictive aspects of the Dogmatic Scale and the Teaching Situation Reaction Test applies to the Fall Quarter group of student teachers only. The relatively large number of people available Fall Quarter (77) enabled a larger number of people to be in the sample selected. From a statistical standpoint it would be desirable to have more student teachers available than seventy-seven for the study, however, this was not possible at Montana State University.

The statistical instruments used in this part of the study included the mean, standard deviation, Z variable, F-test, t-test, and r correlation. Two forms of the t-test were used. They included:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{\Sigma x_1^2 + \Sigma x_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n} + \frac{1}{n_2}\right)}} \qquad t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

The Fisher F-test used to check homogeneity of variances was:

$$F_{n_2-1}^{n_1-1} \geq \frac{S_g^{\,2}}{S_s^{\,2}}$$

The formula for the r correlation used is listed below.

$$r = \frac{\Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{n}}{\sqrt{\left(\Sigma X^2 - \frac{(\Sigma X)^2}{n}\right)\left(\Sigma Y^2 - \frac{(\Sigma Y)^2}{n}\right)}}$$

Heavy reliance was made on statistical source books by Popham (1967) and Lentner (1968).

An Analysis Using the Dogmatism Scale as an Independent Variable

An investigation of the possible predictive value of the Dogmatism Scale was done in the following manner. Dogmatism scores of the Fall Quarter student teachers greater than one standard deviation (21.045) from the mean (142.816) were used as independent variables determining the selection of scores on both the pre- and post-Teaching Situation Reaction Test, the college supervisor's evaluation mean score and the corresponding grade given in student teaching. The data are listed in Tables 6 and 7. Dogmatism scores were 164 or higher to indicate those high in authoritarianism and 121 or lower to indicate those low in this quality.

TABLE 6

CORRESPONDING SCORES TO HIGH DOGMATISM SCORES

Dogmatism Score I.S.D. or higher from mean	Pre-TSRT	Post-TSRT	Average College Super-visor	GPA for Student Teaching
173	207	192	1.164	3.56
178	206	200	1.257	3.56
166	203	198	1.285	4.00
164	228	218	n/a	4.00
165	196	207	2.000	3.00
166	190	194	3.500	2.56
184	202	223	1.285	3.00
169	239	220	2.285	3.00
167	178	194	n/a	3.44
166	194	196	1.571	3.56
171	195	196	1.923	3.44
165	199	192	2.000	4.00
n = 12	$\bar{x}$ = 203.083	$\bar{x}$ = 202.50	$\bar{x}$ = 1.645	$\bar{x}$ = 3.426

TABLE 7

CORRESPONDING SCORES DETERMINED BY LOW DOGMATISM SCORES

Dogmatism Scores I.S.D. or higher from mean	Pre-TSRT	Post-TSRT	Average College Supervisor	GPA for Student Teaching
110	225	219	1.285	4.00
112	217	216	3.500	2.56
114	226	216	1.214	4.00
77	217	209	1.859	3.00
110	232	222	1.928	3.00
110	208	216	2.285	4.00
118	190	209	1.857	3.56
116	208	219	1.000	4.00
114	184	218	1.357	4.00
120	203	216	n/a	3.56
118	202	215	1.285	4.00
121	220	215	1.000	3.00
120	216	203	1.714	3.56
n = 13	$\bar{x}$ = 211.384	$\bar{x}$ = 214.615	$\bar{x}$ = 1.773	$\bar{x}$ = 3.556

Table 6 and Table 7 were included so that the reader may determine how the raw data were linked together for the various instruments used in this phase of the study. Comparisons of average scores were made on the last four columns of Table 6 and Table 7 with the results in Table 8.

TABLE 8

AN ANALYSIS OF SCORES USING DOGMATISM SCORES AS AN INDEPENDENT VARIABLE

High Dogmatism Group				Low Dogmatism Group			
n	Group	Mean	S.D.	n	Group	Mean	S.D.
12	Pre-TSRT	203.083	16.378	13	Pre-TSRT	211.384	16.056
12	Post-TSRT	202.500	11.532	13	Post-TSRT	214.615	5.140
10	College Supervisor	1.645	1.109	12	College Supervisor	1.773	0.667
12	GPA for Student Teaching	3.426	0.460	13	GPA for Student Teaching	3.556	0.507

After the means and variances were calculated, the variances were checked for equality using the F-test. This was used as a guide to determine the appropriate $\underline{t}$ model to use as advised by Popham (1967). A summary of the statistical check of the means for the high and low dogmatism scores determined the following results.

TABLE 9

STATISTICAL SIGNIFICANCE OF SCORES USING DOGMATISM SCORES AS AN INDEPENDENT VARIABLE

Comparison of Groups	t-value	2-tailed Testing criterion at .05 level	Significance
High/Low Pre-TSRT	1.368	2.069	Not Significant
High/Low Post-TSRT	3.349	2.190	Significant
High/Low College Supervisor	.335	2.086	Not Significant
High/Low GPA for Student Teaching	.687	2.069	Not Significant

*Significant at .01 level.

An analysis of Table 9 and the data leading to its preparation showed that the two groups of student teachers, one rated high by the Dogmatism Scale, and the other low, did not differ statistically on the pre-Teaching Situation Reaction Test. However, when the same groups were given the post-Teaching Situation Reaction Test, those students rated as flexible and more non-authoritarian made a significant change.

In the light of previous studies done with this test a desirable change in the teaching competency occurred. A comparison of the mean scores of the college evaluation form showed no difference between the competency of the two groups. A check of the grades

grades achieved in student teaching also failed to detect a difference. As far as the College supervisor was concerned, the traits of flexibility or non-authoritarianism and the ensuing change as measured by the TSRT were not factors in their evaluation.

An Analysis Using the Pre-Test of the Teaching Situation Reaction Test as an Independent Variable

Another aspect of this investigation used the pre-test of the Teaching Situation Reaction Test as an independent variable. It governed the selection of the corresponding dogmatism score, post-test of the Teaching Situation Reaction Test, the college supervisors evaluation mean score and the grade point average achieved during student teaching. Pre-test scores of the Fall Quarter student teachers one standard deviation above and below the mean were used. The mean pre-Teaching Situation Reaction Test for Group A was 204.263, and the standard deviation was 13.667. This included scores 218 or higher and 190 or lower. Data are given in Tables 10 and 11.

Table 11 shows the corresponding scores determined by low Teaching Situation Reaction Test scores. These data are for Fall Quarter student teaching.

Table 10 and Table 11 were included so that the reader may determine the type of linkage between corresponding data when the Teaching Situation Reaction Test was used to determine the selection

TABLE 10

218 AND ABOVE

Pre-TSRT	Dogmatism	Post-TSRT	College Supervisor	GPA for Student Teaching
225	110	219	1.385	4.00
226	n/a	227	n/a	4.00
226	114	216	1.214	4.00
228	152	213	1.857	4.00
228	164	218	n/a	4.00
228	164	218	n/a	4.00
232	110	222	1.928	3.00
239	169	220	2.285	3.00
229	178	224	2.363	3.00
220	121	215	2.000	3.00
219	148	214	1.500	3.00

TABLE 11

190 OR LOWER

Pre-TSRT	Dogmatism	Post-TSRT	College Supervisor	GPA for Student Teaching
190	159	191	2.357	3.00
188	160	204	1.928	4.00
177	147	167	1.000	4.00
190	137	206	2.285	3.00
187	n/a	198	1.500	4.00
187	171	199	3.500	3.00
182	130	195	2.071	3.56
190	166	194	3.500	2.56
190	118	209	1.857	3.56
186	159	180	2.071	3.56
184	114	218	1.357	4.00
188	160	191	1.714	3.56
178	167	194	n/a	3.44
189	n/a	202	2.214	3.00
170	126	181	n/a	4.00

of the other scores. Comparisons of mean scores were made on the last four columns of Table 10 and Table 11 with results listed in Tables 12 and 13.

TABLE 12

AN ANALYSIS OF SCORES USING PRE-TSRT AS AN INDEPENDENT VARIABLE

High Pre-TSRT				Low Pre-TSRT			
n	Group	Mean	S.D.	n	Group	Mean	S.D.
9	Dogmatism	140.666	27.161	13	Dogmatism	147.230	19.837
10	Post-TSRT	218.800	4.451	15	Post-TSRT	195.333	12.697
8	College Supervisor	1.804	0.432	13	College Supervisor	2.104	0.791
10	GPA for Student Teaching	3.400	0.918	15	GPA for Student Teaching	3.482	0.473

After the means and variances were calculated, the variances were checked for equality using the F-test. This was used as a guide to determine the appropriate *t*-model to use. A summary of the statistical check of the means for the high and low pre-TSRT showed the following results.

TABLE 13

STATISTICAL SIGNIFICANCE OF SCORES USING PRE-TSRT AS AN INDEPENDENT VARIABLE

Comparison of Groups	t-value	Testing Criterion at .05 level	Significance
High/Low Dogmatism	.658	2.086	Not Significant
High/Low Post-TSRT	6.556*	2.204	Significant
High/Low College Supervisor	.261	2.204	Not Significant
High/Low GPA for Student Teaching	1.056	2.093	Not Significant

*Significant at the .01 level.

An analysis of Table 13 and the data shows a failure of the pre-test of the <u>Teaching Situation Reaction Test</u> to predict corresponding people high or low in flexibility or non-authoritarianism. Neither does the pre-test of the TSRT predict grades achieved in student teaching or the evaluation score recorded by the college supervisor. A significant relationship does exist between the pre- and post-test scores of the TSRT.

An Analysis Using the Grade Point Average Achieved in Student Teaching as an Independent Variable

During the Fall Quarter seventy-seven secondary student teachers were involved with the testing program discussed in this study. Thirty-five of these people achieved a 4.0 grade point average for student teaching, while twenty-four achieved a 3.0 or less. For purposes of analysis the thirty-five who achieved a 4.0 average for student teaching were placed in one group and the twenty-four with a 3.0 or less in a second group. The grade point average in student teaching was used as a basis for selecting scores on the Dogmatism Scale, Teaching Situation Reaction Test, and the college supervisor's evaluation form. The results are presented in tabular form in Table 14.

TABLE 14

AN ANALYSIS OF SCORES USING GPA IN STUDENT TEACHING AS AN INDEPENDENT VARIABLE

Four-Point GPA in Student Teaching Group				Three-Point GPA or less in Student Teaching Group			
n	Group	Mean	S.D.	n	Group	Mean	S.D.
31	Dogmatism Scale	140.580	18.828	23	Dogmatism Scale	144.434	24.053
35	Pre-TSRT	204.580	13.703	24	Pre-TSRT	206.500	6.612
35	Post-TSRT	207.371	14.820	24	Post-TSRT	202.375	11.590
29	College Supervisor	1.518	0.450	24	College Supervisor	2.485	0.654

After the means and variances were calculated, the variances were checked for equality using the F-test. This was used as a guide to determine the appropriate *t* model. A summary of the statistical check of the means for the high and low grade point averages achieved in student teaching determined the following results.

TABLE 15

STATISTICAL SIGNIFICANCE OF SCORES USING GPA IN STUDENT TEACHING AS AN INDEPENDENT VARIABLE

Comparison of Groups	t-value	Testing criterion at .05 level	Significance
High/Low Dogmatism	.670	2.01	Not significant
High/Low Pre-TSRT	.666	2.05	Not significant
High/Low Post-TSRT	1.397	2.00	Not significant
High/Low College Supervisor	6.715*	2.05	Significant

*significant at .01 level.

An analysis of Table 15 and the data leading to its preparation shows general flexibility and non-authoritarianism does not seem to be a significant factor in the grade achieved in student teaching. In a like manner, scores achieve on both pre- and post-*Teaching Situation Reaction Tests* for the high and low grade point average groups do not differ. On the basis of this test, one may conclude that neither the *Dogmatism Scale* nor the *Teaching Situation Reaction Test* had value in predicting the success of student teachers as it was measured by their college supervisor at Montana State University during Fall Quarter, 1969. There does appear to be a highly significant relationship between the college supervisor evaluation form and the grade achieved in student teaching. A Pearson r correlation was computed using the results of the college supervisor's evaluation form (Appendix C) and the classroom teacher's evaluation form (Appendix D). The r value computed was .634. Even though different forms were used there is a significant relationship between the views of the classroom teacher and the college supervisor.

A Comparison of Groups A, B, C, E and F Using the Flanders' System of Coding and Analysis

Since several different groups of student teachers were involved in various aspects of this part of the study, a comparison of the mean scores achieved by them on the Dogmatism Scale, the Teaching Situational Reaction Test, and grade point average achieved in their subject area major was made to determine if the groups compare favorably in the qualities measured by these instruments. Techniques of analysis involving the F-tests and t-tests were used.

TABLE 16

DOGMATISM SCORES

Group	Mean	S.D.
A	142.816	21.045
B	143.405	22.957
C	137.000	16.596
E	131.437	20.297
F	129.400	23.791

Table 16 is a listing of all the different groups of student teachers involved in the study. Means and standard deviations given in this table were used in later analysis.

TABLE 17

INTERGROUP COMPARISONS OF DOGMATISM SCORES

Group Pairs	F-value	Critical Value at .10 level	Significance	t-value	Critical Value at .05 level	Significance
A/E	1.074	1.72	Not Significant	2.576	1.990	Significant
C/F	2.054	2.90	Not Significant	1.079	2.086	Not Significant

Under the assumption that both Group A and Group E could be considered the entire population of secondary school teachers for their respective quarters Z-tests were made to test the subsample group against the entire population groups, i.e., A and E. The Z variable used was $Z = \frac{\bar{X} - u_0}{\sigma \bar{x}}$. The null hypothesis was rejected if $/Z/ \geq Z_{1-\alpha/2}$.

TABLE 18

INTRAGROUP COMPARISONS OF DOGMATISM SCORES

Group Pairs	Z value	Critical Value at .05 level	Significance
A/C	2.329	1.960	Significant
A/B	.235	1.960	Not Significant
B/C	1.691	1.960	Not Significant
E/F	.565	1.960	Not Significant

In comparing Group A and Group C the results were significant at the .05 level, but they were not significant at the .01 level. This means, then, that there was some question whether those people who major in math, science, social studies and English had the same degree of flexibility as the total secondary population Fall Quarter, 1969.

The same tests were applied to the Winter Quarter Groups of E and F. In this case the results were not significant. Group F reflected the entire Group E.

As a check on the random sampling techniques employed, Group C was compared against Group B. The results show that Group C reflected the mean of the larger Group B.

To summarize Table 18, one could conclude that nearly all subsamples reflected the population as a whole in the area of general authoritarianism. Only Group C appeared to deviate from this pattern and this deviation was not significant at the .01 level.

An identical analysis to that just concluded with the Dogmatism Scale was performed on the various groups using the pre-test of the Teaching Situation Reaction Test as a measuring device. The statistical summary is given in Tables 19, 20, and 21.

TABLE 19

PRE-TEST OF TSRT

Group	Mean	S.D.
A	204.263	13.667
B	204.324	13.474
C	206.416	13.924
E	211.812	11.982
F	215.600	8.000

Table 19 is a listing of all the different groups of student teachers involved in this aspect of the study. The means and standard deviations given in this table are further analyzed in Tables 20 and 21.

TABLE 20

INTERGROUP COMPARISON OF PRE-TSRT SCORES

Group Pairs	F-value	Critical Value at .10 level	Significance	t-value	Critical Value at .05 level	Significance
A/E	1.301	1.69	Not Significant	2.727	1.980	Significant
C/F	2.027	3.10	Not Significant	1.844	2.086	Not Significant

Table 20 shows a statistical summary of both the F-test and the t-test. An examination of the results cited in Table 20 showed that the Teaching Situation Reaction Test reflected a significant difference between all available secondary student teachers Fall Quarter, 1969, i.e., Group A and all available secondary student teachers Winter Quarter, 1970, i.e., Group B. The Winter Quarter group had a significantly higher, or more desirable mean. However, a comparison of the mean scores of Groups C and F, i.e., the Flanders and non-Flanders group respectively, showed values that were not statistically significant. This is important because these two groups will be compared extensively later in the study.

TABLE 21

INTRAGROUP COMPARISON OF PRE-TSRT SCORES

Group Pairs	Z value	Critical Value at .05 level	Significance
A/C	1.373	1.960	Not Significant
A/B	.038	1.960	Not Significant
B/C	.944	1.960	Not Significant
E/F	1.788	1.960	Not Significant

Table 21 shows the same kind of Z-test described earlier in reference to the subsample testing using the data from the Dogmatism Scale. All intragroup comparisons were not significant. Therefore, one may conclude that Group C approached educational problems posed by the Teaching Situation Reaction Test in a manner similar to the total Group A. In a like manner, the subgroup F approached educational problems in a manner similar to Group E. However, especially in the latter case, there was some evidence that the approaches of Groups E and F might be different.

A third comparison involving the same subgroups was made. The analysis followed identical procedures to the previous two. This time the grade point average achieved in the major subject area was the criterion used. The results of this aspect of the study are given in Tables 22, 23, and 24.

TABLE 22

GPA IN MAJOR

n	Group	Mean	Standard Deviation
77	A	2.942	.433
38	B	2.792	.382
12	C	2.710	.334
32	E	2.782	.432
10	F	2.946	.507

Table 22 is a listing of all the different groups of student teachers involved in this aspect of the study. The means and standard deviations were further analyzed in Tables 23 and 24.

TABLE 23

INTERGROUP COMPARISON OF GPA IN MAJOR SUBJECT

Group Pairs	F-value	Critical Value at .10 level	Significance	*t*-value	Critical Value at .05 level	Significance
A/E	1.000	1.72	Not Significant	1.797	1.98	Not Significant
C/F	5.848	3.10	Significant	1.255	2.23	Not Significant

As a result of the information presented in Table 23, one may conclude that the total available number of student teachers Fall Quarter, 1969, did not have a significantly different grade point average in the major area when compared to a like group Winter Quarter, 1970. In a like manner, it was found that there was no significant difference between the two special groups, i.e., Groups C and F.

TABLE 24

INTRAGROUP COMPARISONS OF GPA IN MAJOR SUBJECT

Group Pairs	Z value	Critical Value at .05 level	Significance
A/C	4.734	1.960	Significant
A/B	3.061	1.960	Significant
B/C	.231	1.960	Not Significant
E/F	2.197	1.960	Significant

Table 24 shows the same kind of Z-test used previously. In this case a number of significant results occurred. The intragroup comparisons pointed up the fact that subgroups B and C had a significantly lower grade point average than group A. In a similar manner, subgroup F had a significantly higher value than Group E.

Summary of Group Comparisons

Since extensive comparisons of Groups C and F follow, a summary was made at this point. No significant difference was found between Groups C and F in any of the areas checked. They were statistically the same in the areas of flexibility and non-authoritarianism. They compared favorably in the areas of grade point average in their major subject areas and how they approached educational problems as measured by the TSRT.

When one compared the Groups A and E, however, some differences were noted. The total group of secondary student teachers Fall Quarter, 1969, appeared to be more dogmatic and scored significantly lower on the _Teaching Situation Reaction Test_. There was no significant difference in grade point average in the major area over the two quarters.

An extensive comparison of Groups C and F using the Flanders system of coding and analysis follows. The remainder of this chapter is divided into two sections. The first section presents the results of classroom visitations on non-interaction student teachers, Group C, while the second section presents results on the interaction student teachers, Group F.

Fall Quarter Student Teacher Number 1

Matrix number one was probably atypical. Certainly the writer noted nothing like it in the literature or any other student teachers that were visited.

The extremely large amount of time spent in category ten, confusion, indicated a problem in the classroom management. The 54.260 percent indicated a very severe loss of classroom time. The 1.118 percent which was the combined totals of all categories of praise likewise reflected a possible lack of rapport and possibly a basic lack of knowledge in psychological learning theories. Due to over half the time being spent in noise and confusion, the amount of time spend in teacher-talk (26.470 percent) and student-talk (19.275 percent) may not be relevant.

Each of seven cells in the matrix contained three percent of the tallies or more. Three of these were steady-state cells. They included the (5,5), (6,6), and (10,10) cells. These indicated extended lecture, extended directions and extended confusion, respectively. The other four cells were the (4,8), (8,10), (10,4) and (10,8) cells. These transition cells reflected the most prominent kinds of interaction present in the classroom. The (4,8) cell reflected the teacher-question to student-answer phase. The (8,10) cell reflected the nature of the student-answer to confusion phase.

TABLE 25

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 1

	1	2	3	4	5	6	7	8	9	10
1										
2				0.140				0.070		0.629
3		0.070			0.070			0.140		
4				0.210				4.260	0.210	0.419
5				0.210	11.104	0.908	0.070		0.210	0.769
6				0.210	0.629	3.003	1.140	1.140	0.070	1.397
7				0.210	0.070	0.280	0.070	0.070	0.070	0.559
8		0.769	0.280	0.908	0.280	0.140	0.280	2.305		13.408
9				0.070	0.350	0.070			0.140	0.280
10				3.143	0.838	1.188	0.769	11.383	0.210	36.802
T*										

*T indicates Total

The (10,4) cell was confusion back to a teacher-question. The (10,8) cell reflected the confusion back to a student-answer. This was basically a question-answer type lesson with little praise and a great amount of class confusion.

Fall Quarter Student Teacher Number 2

An analysis of the matrix for teacher number two presents a much different case than the one discussed previously. In this case teacher-talk was 76.127 percent of the time, while student-talk was 17.788 percent. If these figures were compared to averages for Fall Quarter, 1969, the teacher was talking more than average and the students less than average. The lessons were intended to be essentially lecture with some question and answer and it is evident from the matrix.

Each of six cells contained over three percent of the tallies in the matrix. Four of these cells were steady-state cells. They included the (4,4), (5,5), (7,7), and (10,10) cells. Two other cells were transitional cells. They included the (4,8) and (5,4) cells. The (4,4) cell indicated extended question or repetitious questions; the (5,5) was extended lecture; the (7,7) was extended criticism; the (10,10) cell indicated a shift from teacher-question to student-answer and the cell (5,4) reflected a shift from teacher-lecture to teacher-question.

TABLE 26

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 2

	1	2	3	4	5	6	7	8	9	10
1	0.034	0.034		0.102	0.034			0.034		
2	0.068	0.442	0.781	0.679	0.611	0.068	0.068	0.204	0.170	0.306
3		0.068	0.136	0.306	1.121	0.034		0.034	0.102	0.034
4	0.034	0.136		3.599	0.374	0.136	0.476	7.842	0.578	1.256
5	0.034	0.170	0.034	3.734	25.730	0.374	0.679	0.272	1.630	1.460
6		0.068		0.340	0.374	2.682	0.170	0.068	0.374	0.408
7			0.068	1.358	0.883	0.272	3.666	0.102	0.171	0.713
8	0.034	1.867	0.985	1.969	1.256	0.340	0.951	2.037	0.442	1.155
9	0.034	0.408	0.136	0.340	2.241	0.068	0.442	0.102	2.648	0.340
10		0.204		2.003	1.494	0.510	0.883	0.340	0.544	10.116
*T	0.238	3.395	2.139	14.427	34.115	4.481	7.332	11.032	6.755	16.090

*T indicates Total

This teacher was one of the highest in the area of extended direct, extended indirect, and confusion. This was an unusual situation in which both large amounts of praise and criticism were given. This teacher was largely lecture oriented with sincere efforts made by the teacher to "reach" the students on a more "human level."

Fall Quarter Student Teacher Number 3

An examination of the matrix for teacher number three showed teacher-talk covered 75.976 percent of the time while student-talk was 13.207 percent. The teacher-talk was above average for Fall Quarter, 1969, while the student-talk was below average for the same period. Class methods revolved essentially around the lecture with some efforts to include the students in question and answer procedures.

Each of six cells contained at least three percent of the tallies in the matrix. Five of these cells were steady-state cells indicating a deliberate style of teaching. These cells included the (5,5), (6,6), (7,7), (9,9) and (10,10) cells. The heavy loading of the (5,5) cell (41.977 percent) indicated extended lecture; the (6,6) was extended direction; (7,7) was extended criticism; the (9,9) was extended student-answer; and the (10,10) was extended silence. The one transition cell, (4,8) reflected a shift from teacher-question to student answer.

TABLE 27

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 3

	1	2	3	4	5	6	7	8	9	10
1				0.029						
2		0.057	0.427	0.341	0.569			0.029	0.171	0.029
3		0.029	0.086	0.313	0.796	0.029			0.057	0.086
4				0.023	0.455	0.144	0.057	3.522	1.563	0.853
5		0.086	0.114	2.926	41.977	1.051	1.023	0.177	1.648	0.711
6				0.285	0.569	4.743	0.398	0.143	0.143	0.540
7			0.029	0.427	1.023	0.256	6.078	0.029	0.256	0.739
8	0.029	0.682	0.427	0.767	1.080	0.057	0.398	1.364	0.144	0.560
9		0.682	0.313	0.285	2.187	0.029	0.455		3.465	0.313
10		0.086		1.193	1.051	0.540	0.427	0.228	0.313	6.987
*T	0.029	1.619	1.329	7.584	49.702	6.817	8.833	5.482	7.726	10.821

*T indicates Total

Of the relatively low percentage of student-talk (13.207 percent), over half (7.726 percent) was student initiated. The area of extended direct contained the most tallies of any of the student teachers observed. This teacher would typify many aspects of a direct teacher. The class remained orderly at all times but the atmosphere was somewhat strained.

Fall Quarter Student Teacher Number 4

An analysis of matrix number four showed a number of interesting and exciting teaching proficiencies. Teacher-talk was 53.508 percent and student-talk was 37.696 percent. Student-talk was much above average for Fall Quarter, 1969, while teacher-talk was substantially less than average for the same period. Class procedures revolved around the discussion method.

Each of six cell contained over three percent of the tallies in the matrix. Three of these cells were steady-state cells, while three were the transitional cells. The steady-state cells included the (5,5), (8,8) and (9,9) cells. The (5,5) cell was extended lecture; the (8,8) cell was extended student-response to a narrow question, while the (9,9) cell indicated extended student-response to broad teacher-questions. The transition cells included the (4,8), (4,9), and the (5,8) cells. The (4,8) and (4,9) cells reflected the transition from teacher-question to student-answer, while the (5,8)

TABLE 28

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 4

	1	2	3	4	5	6	7	8	9	10
1					0.039					
2		0.078	0.390	1.286	1.480	0.274		0.234	1.013	0.117
3		0.312	0.234	0.546	1.363		0.039	0.312	0.312	0.156
4			0.117	1.363	0.701	0.117	0.078	3.233	4.362	1.441
5	0.039	0.195	0.117	2.960	17.212	0.974	0.156	3.466	2.376	1.091
6				0.234	0.546	1.247	0.117	0.662	0.195	0.546
7			0.039	0.351	0.351	0.039	0.156	0.195	0.468	0.195
8		1.025	0.974	1.519	2.648	0.195	0.429	10.592	0.156	1.130
9		2.181	1.69	1.986	1.687	0.234	0.624	0.078	8.567	0.507
10		0.078	0.234	1.169	1.558	0.468	0.195	0.896	0.585	3.622
*T	0.039	4.848	3.232	11.410	28.583	3.544	1.792	19.666	18.030	8.901

cell reflected the intermittent teacher-student interaction. This teacher used praise rather extensively (8.179 percent) as compared to criticism (1.792 percent).

It was obvious that this teacher was well liked by the classroom teacher and the students. It seemed likely that some of this affection was brought about by the indirect style that was exhibited in several areas of the matrix.

Fall Quarter Student Teacher Number 5

An analysis of the matrix for teacher number five showed teacher-talk covered 74.239 percent of the time while student-talk covered 15.557 percent of the time. Teacher-talk was somewhat above average for Fall Quarter, 1969, while, once again, student-talk was below average for the same period of time. The class situation was of a rather formal nature with the class technique revolving around the lecture method with some question and answer included.

Each of five cells contained over three percent of the tallies in the matrix. Two of these cells were steady-state cells. They included the (5,5) and (10,10) cells. The rather high percentage in the (5,5) cell (39.823 percent) reflected the extended lecture which was dominant in the lesson. The (10,10) cell showed extended periods of silence. The three interactive or transitional cells included the (4,8), (8,3) and (5,4) cells. The (4,8) cell reflected the

TABLE 29

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 5

	1	2	3	4	5	6	7	8	9	10
1	0.031			0.031	0.184					
2			0.153	0.887	0.826				0.062	0.367
3		0.031	0.062	1.345	2.598		0.031	0.062		0.214
4		0.031		1.865	0.795	0.031	0.062	9.383	0.153	1.315
5	0.031	0.062	0.062	6.235	39.823	0.489	0.367	0.520	1.315	1.437
6	0.031			0.123	0.428	0.428	0.062	0.031	0.031	0.276
7				0.337	0.520	0.123	0.398	0.276	0.123	0.214
8	0.153	2.048	3.821	1.467	1.865	0.092	0.795	2.170	0.062	0.489
9		0.123	0.184	0.062	1.437	0.031	0.092		0.612	0.062
10			0.062	1.284	1.865	0.214	0.184	0.520	0.245	5.838
*T	0.245	2.293	4.340	13.631	50.337	1.406	1.987	12.959	2.598	10.208

*T indicates Total

transition from teacher-question to student-answer, while the (8,3) cell showed the teacher acceptance of the student-answer. The (5,4) cell demonstrated the shift from lecture to teacher-question.

The lesson would be typified by a more formal lecture approach with student involvement about narrow questions. This approach was softened somewhat by a fairly extensive use of praise and acceptance of student ideas. The 4.3 percent total for column three was one of the highest totals of the group observed.

Fall Quarter Student Teacher Number 6

An analysis of matrix number six showed teacher-talk utilizing 59.919 percent of the time while student-talk occupied 22.625 percent of the class time. Teacher-talk was considerably below average for this group of student teachers, while student-talk was above average.

As it is obvious from the matrix, the class was organized around student involvement. Students were involved in demonstrations as well as a discussion type lesson.

Each of eight cells contained over three percent of the tallies in the matrix. This indicated a greater number of teacher-student interactions than has been observed before. This variety would tend to hold class interest. Four steady-state cells were involved. They included the (4,4), (5,5), (8,8) and (10,10) cells. The (4,4) cell reflected the extended question or paraphrasing ques-

TABLE 30

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 6

	1	2	3	4	5	6	7	8	9	10
1		0.036		0.036						
2		0.284	0.922	2.022	1.383	0.107		0.071	0.107	0.710
3		0.178	0.107	1.561	1.383			0.213		0.497
4		0.036	0.071	8.015	0.497			10.213	1.029	2.164
5	0.036	0.071		4.362	13.688	0.391	0.107	0.391	0.674	1.774
6				0.213	0.071	1.029	0.071	0.071	0.071	0.639
7				0.710	0.178	0.142	0.178	0.071	0.107	0.284
8		4.717	2.412	1.738	1.100	0.071	0.710	5.852	0.284	1.490
9	0.036	0.249	0.284	0.284	1.206	0.036	0.249	0.071	1.454	0.391
10			0.142	3.086	2.022	0.391	0.355	1.419	0.532	12.518
*T	0.071	5.568	3.937	22.022	21.490	2.164	1.667	18.369	4.256	20.461

*T indicated Total

tion, while the (5,5) reflected extended lecture. The 13.688 percent for the (5,5) cell was relatively low. The (8,8) cell signified extended student response to narrow questions while the (10,10) cell determined the amount of extended silence. There were also four transition cells. They included the (4,8), (8,2), (10,4) and (5,4) cells. The pair of cells (4,8) and (8,2) showed a definite pattern of teacher-question--student-answer--teacher-praise. If one checks the (2,4) cell, the sequence will be completed by another teacher-question. The other transition cells showed a shift from lecture to teacher-question and a shift from silence to teacher-question. The relatively large amount of silence (20.461 percent) indicated that perhaps the class pace was a little too slow and too much time was elapsing between questions.

Fall Quarter Student Teacher Number 7

An analysis of matrix seven showed teacher-talk was 78.994 percent of the time, while student-talk was 10.197 percent of the classtime. The teacher-talk was much above average for this group.

The class procedure was oriented around the lecture with allowance for some questions. The lessons included the showing of rock samples and slides.

TABLE 31

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 7

	1	2	3	4	5	6	7	8	9	10
1										
2		0.103	0.103	1.648	1.854		0.103		0.103	0.515
3			0.309	0.412	0.515					
4				4.326	0.309			6.489	0.824	1.678
5		0.206		4.841	49.228	0.309		0.103	0.721	1.442
6				0.103	0.103	0.618			0.103	0.412
7				0.103	0.309				0.103	
8		4.017	0.721	0.618	0.618		0.412	1.133		0.206
9		0.103	0.103		1.751	0.103			0.412	
10				2.575	2.163	0.309			0.206	5.562
*T		4.429	1.236	14.625	56.849	1.339	0.515	7.724	2.474	10.814

*T indicates Total

Each of six cells contained over three percent of the tallies in the matrix. Three of these cells were steady-state cells. They included the (4,4), (5,5) and (10,10) cells. The (4,4) cell reflected extended questions, while the (5,5) showed extended lecture, and the (10,10) cell indicated extended silence. The heavy loading of 49.228 percent in the (5,5) cell showed the extent of lecture in this person's teaching style. The transition cells of (4,8) and (8,2) followed as natural results of the extended questions in the (4,4) cell. They indicated a sequence of teacher-question--student-answer--teacher-praise, which was generally considered a favorable style of teaching by research cited earlier. The other transition cell of (5,4) reflected a shift from teacher-lecture to teacher-question.

In a conversation with this teacher after the observation, he indicated he felt the pressure of staying abreast, content-wise, with his classroom teacher. This pressure of coverage turned a lesson that could have had great student involvement into one dominated by the teacher. This was expecially noted in the decrease of student involvement as the lesson progressed. The teacher was watching the clock and making sure that his lesson plan was covered by the end of the period.

Fall Quarter Student Teacher Number 8

An analysis of matrix number eight showed teacher-talk occupied 83.829 percent of the time while student-talk covered 8.866 percent of the class time. This was much above average for the Fall Quarter, 1969, teacher-talk, and much below for student-talk for the same period. Of the student-talk, only 1.089 percent was student initiated. The class procedure was lecture oriented with some question and answer.

Each of five cells contained over three percent of the tallies in the matrix. Three of the cells were steady-state cells. These included the (4,4), (5,5) and the (10,10) cells. The (4,4) cell reflected extended teacher-questions, while the (5,5) cell signified teacher-lecture. This value of 58.632 percent was particularly large when compared to the other student teachers in this group. The periods of silence were quite small in this classroom. The two transition cells of (4,8) and (5,4) showed shifts from teacher-question to student-answer and from lecture to question, respectively.

An examination of the "content cross" showed the highest figure for all student teachers. This person was well organized and spend 88.198 percent of the time communicating course content. This was also reflected in the low figure for total silence.

TABLE 32

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 8

	1	2	3	4	5	6	7	8	9	10
1										
2		0.052	0.208	0.260	1.504			0.052		
3			0.052	0.156	2.178			0.104		0.052
4				3.733	0.830			4.459	0.312	2.644
5			0.104	5.288	58.632	0.260		0.674	0.571	0.830
6				0.520	0.520	0.156		0.363		0.208
7					0.520					
8		1.970	2.074	1.089	0.778	0.363	0.052	1.348		0.104
9		0.052	0.104		0.778				0.156	
10				1.400	1.556	0.052		0.778	0.052	3.474
*T		2.074	2.541	11.976	66.356	0.830	0.052	7.777	1.089	7.310

*T indicates Total

In a conversation with the student teacher after the observation, the student teacher expressed surprise at the small number of times the students were involved in the lesson. Apparently, the classroom teacher asked for even less student involvement, and got it. The student teacher was trying for involvement and at this point failed to realize the lack of success.

Fall Quarter Student Teacher Number 9

An analysis of matrix number nine showed teacher-talk occupied 63.870 percent and student-talk covered 19.083 percent of the time. Both figures were near average for this group of student teachers. An unusual feature regarding the student-talk was the relatively high amount (14.774 percent) that was student initiated. This would tend to indicate a more open classroom climate. The class lessons used lecture in combination with teacher-student discussion.

Each of six cells contained over three percent of the tallies in the matrix. Three were steady-state cells. They included the (5,5), (9,9), and (10,10) cells. The (5,5) cell reflected extended lecture while the relatively high use of the (9,9) cell was an indicator of the indirect teacher. The (10,10) cell signified silence. The transition cells included the (5,10), (10,5), and (9,5) cells. The (5,10) and (10,5) cells showed a

TABLE 33

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 9

	1	2	3	4	5	6	7	8	9	10
1										
2		0.072	0.214	0.250	0.356	0.036			0.855	0.072
3			0.143	0.392	0.606	0.072		0.036	0.143	0.143
4				0.890	0.570	0.072	0.036	1.994	2.279	2.172
5			0.107	2.920	38.840	0.926	0.143	0.072	2.314	3.062
6		0.036		0.285	0.250	1.531	0.036		0.356	0.712
7				0.036	0.178		0.214	0.107	0.250	0.107
8		0.214	0.107	0.499	0.677	0.036	0.072	1.887	0.285	0.534
9		1.424	0.855	0.819	3.560	0.072	0.250	0.036	6.551	1.211
10		0.107	0.107	1.923	3.347	0.463	0.143	0.178	1.745	9.043
*T		1.852	1.531	8.010	48.381	3.204	0.890	4.308	14.774	17.053

*T indicates Total

deliberate style of teacher-lecture, perhaps even a little too slow because over 17 percent of the class time was silence. The (9,5) cell showed the interplay between student initiated statement and the teacher's response.

Although many student teachers avoid the issue of discipline by allowing little "give and take", this teacher met the issue and was extremely skillful in working with students that could be classroom problems. Neither force nor sarcasm were used, but skill in asking questions or turning a phrase were the only approaches used.

Fall Quarter Student Teacher Number 10

An analysis of matrix number ten showed teacher-talk of 69.466 percent while student-talk occupied 22.328 percent of the class time. Both figures were slightly above average for their respective groups Fall Quarter, 1969. Of the total student-talk approximately one-fourth was self-initiated. The classroom style was a combination of lecture and question and answer.

Each of ten cells contained over three percent of the tallies in the matrix. This showed a wide variety of teaching style and would tend to increase class interest. Four of these cells were steady-state cells. They included the (4,4), (5,5), (8,8) and (10,10) cells. The (4,4) cell showed extended teacher-questions while the (5,5) cell signified extended teacher-lecture.

TABLE 34

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 10

	1	2	3	4	5	6	7	8	9	10
1										
2			0.355	3.131	1.300		0.060	0.295	0.060	0.237
3		0.119		1.773	0.887			0.060		
4		0.119		6.380	0.709	0.119	0.060	12.050	2.954	2.422
5		0.060		6.498	24.395	0.119		0.237	2.304	1.064
6				0.060	0.119	0.119		0.119	0.060	0.119
7				0.709	0.178				0.060	0.178
8		4.962	2.304	2.208	1.359		0.887	3.131	0.060	0.119
9		0.119	0.119	0.532	4.667	0.060	0.060		0.473	0.178
10		0.060	0.060	2.422	1.064	0.178	0.060	0.237	0.237	3.899
*T		5.435	2.836	24.809	34.673	0.591	1.123	16.126	6.203	8.211

*T indicates Total

The (8,8) cell indicated student response to narrow questions while the (10,10) cell showed extensive silence.

There were six transition cells. They included the (4,8), (8,2), (8,4), (9,5), (5,4) and (2,4) cells. The (4,8), (8,2) and (8,4) cells reflected the question-answer type style of the lesson. They followed naturally from the (4,4) cell. The sequence might also take the form of teacher-question--student-answer--teacher-question. The (9,5) cell showed the intermittent student-teacher interaction, while the (5,4) cell showed the shift from lecture to question. The (2,4) cell indicated the change from teacher-praise to another question.

Fall Quarter Student Teacher Number 11

An analysis of matrix number eleven showed teacher-talk covered 67.164 percent of the class time while student-talk used 17.792 percent of the class time. Both figures were very near average for this group of people. Of the student-talk, nearly one-half of the total was student initiated. The class procedures revolved around the lecture with some question and answer to clarify points of confusion.

Each of five cells contained over three percent of the tallies in the matrix. Two of these cells were steady-state cells. They were the (5,5) and (10,10) cells. Once again, there was a

TABLE 35

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 11

	1	2	3	4	5	6	7	8	9	10
1										
2				0.297						0.445
3			0.075	0.223	0.371			0.075		0.075
4				2.892	0.233			6.079	1.631	2.076
5				4.448	39.141	0.371	0.075	0.742	2.966	1.631
6						1.038		0.075	0.371	0.149
7					0.233					0.149
8		1.780	0.742	2.373	1.854	0.075	0.075	1.631		1.261
9		0.297		0.371	3.929	0.075	0.075		2.743	0.519
10				2.298	2.298	0.075	0.149	1.187	0.297	8.748
*T		2.076	0.816	12.899	49.370	1.631	0.371	9.786	9.006	15.049

*T indicates Total

large amount of extended teacher-lecture (39.141 percent). The (10,10) cell reflected extended silence. The three transition cells included the (4,8), (5,4), and (9,5) cells. The relatively large percentage in the (4,8) cell when compared to the smaller amount in the (4,4) cell indicated a number of brief student answers. The (5,4) showed a shift from teacher-lecture to teacher-question. The (9,5) cell showed intermittent student-teacher interaction.

Relatively small amounts of praise were used considering the amount of student response noted. This can be confirmed by noting the sum of columns 1, 2, and 3 and the extended indirect area in Table 35.

Fall Quarter Student Teacher Number 12

An analysis of matrix number twelve showed teacher-talk of 78.265 percent and student-talk of 15.943 percent. The teacher-talk was considerably above normal while the student-talk was below normal for the group. Of the student-talk, about one half of the total was student initiated. The class was lecture oriented with some student reports.

Each of four cells contained over three percent of the tallies in the matrix. Three of these cells were steady-state cells. They included the (5,5), (8,8) and (10,10) cells. The (5,5) cell,

TABLE 36

PERCENTAGE MATRIX FOR FALL STUDENT TEACHER NUMBER 12

	1	2	3	4	5	6	7	8	9	10
1										
2		0.044		0.132	0.528				0.044	
3		0.044		0.088	0.308				0.044	
4				0.571	0.176	0.044		1.230	1.362	0.308
5		0.044		2.284	64.735	0.396	0.396	0.132	2.855	0.747
6				0.088	0.352	0.132			0.088	0.308
7				0.044	0.308	0.044	0.088		0.264	0.044
8		0.352	0.176	0.132	0.659		0.044	7.308		0.044
9		0.264	0.308	0.132	3.470	0.132	0.264		1.828	0.835
10				0.220	1.055	0.220		0.044	0.747	3.514
*T		0.747	0.484	3.609	71.586	0.967	0.791	8.713	7.230	5.798

*T indicates total

with over sixty-four percent of the time spent in extended teacher-lecture was very high. The (8,8) cell covered extended student participation while the (10,10) cell signified extended periods of silence. The transition cell, (9,5) showed the relative amounts of student initiated talk followed by a teacher response to that talk.

In a later conversation with this student teacher, the student teacher showed complete satisfaction with the results of this observation. The lesson was intended to be a lecture, and in this success must be noted. The class that this close supervision was used in was a low achieving class. This brings up to a point cited earlier, "closer supervision through the use of direct influence, an all too common antidote to lower achievement, may be more harmful than helpful for dependent-prone students."(Amidon and Flanders, 1961, p. 289)

Fall Quarter Composite Student Teacher Matrix

An analysis of the composite student teacher matrix covering all student teachers Fall Quarter showed teacher-talk covered 66.928 percent of the class time, while student-talk occupied 18.745 percent of the time. These figures were considered averages for Fall Quarter. More than one-third of the student-talk was student initiated. This compares with another study done with 65.11 percent teacher-

TABLE 37

COMPOSITE PERCENTAGE MATRIX FOR FALL STUDENT TEACHERS

	1	2	3	4	5	6	7	8	9	10
1	0.008	0.008		0.022	0.029			0.004		
2	0.008	0.106	0.356	0.878	0.917	0.050	0.015	0.078	0.268	0.251
3		0.075	0.099	0.631	1.135	0.015	0.008	0.092	0.075	0.163
4	0.044	0.029	0.018	2.739	0.512	0.064	0.078	5.827	1.442	1.562
5	0.015	0.075	0.057	3.924	34.902	0.600	0.325	0.596	1.678	1.358
6	0.004	0.011		0.191	0.325	1.555	0.103	0.141	0.156	0.519
7			0.015	0.409	0.448	0.113	1.255	0.096	0.184	0.300
8	0.025	1.985	1.336	1.298	1.241	0.120	0.476	3.046	0.141	1.319
9	0.008	0.586	0.353	0.431	2.327	0.071	0.261	0.029	3.189	0.413
10		0.053	0.057	1.752	1.696	0.416	0.300	1.079	0.533	8.488
*T	0.067	2.922	2.288	12.270	43.527	3.000	2.817	10.984	7.762	14.367

*T indicates Total.

talk and 26.29 percent student talk.(Amidon and Hough, 1967) This second study was done at the Ohio State University and involved thirty student teachers.

Each of six cells contained over three percent of the tallies in the matrix. Four of these cells were steady-state cells. They included the (5,5), (8,8), (9,9) and (10,10) cells. The inclusion of the (8,8) and (9,9) cells reflected the amount of time spent in extended student-response. The use of extended teacher-lecture was a dominant teaching style, as it was nearly 35 percent of the class time.

The two transition cells that fall into the category of over three percent were the (5,4) and (4,8) cells. The (5,4) cell showed the shift from lecture to question, while the (4,8) cell showed the shift from question to answer.

The low figures in the first three column total showed that praise was used only one-half as much as in the study involving thirty student teachers at the Ohio State University cited earlier. (Amidon and Hough, 1967)

The low total in column six reflected the fact that the directions given by student teachers were often incomplete. It is pleasing to note that the small amount of direct criticism tends to mark a good relationship between teacher and class, but this must be tempered with the thought that the discipline is usually a product of the classroom teacher.

TABLE 38

FALL QUARTER STUDENT TEACHERS

Category	Student Teacher Number												Mean
	1	2	3	4	5	6	7	8	9	10	11	12	
I/D Ratio	0.307	0.440	0.163	0.478	0.382	1.284	0.346	0.247	0.217	0.909	0.307	0.067	0.434
Revised I/D Ratio	0.162	0.489	0.195	1.533	2.028	2.500	3.056	5.236	0.827	4.828	1.445	0.700	1.916
Extended Indirect	0.074	1.566	0.601	1.017	0.280	1.529	0.519	0.316	0.532	0.477	0.079	0.092	0.581
Extended Direct	3.494	6.791	11.476	1.560	1.011	1.420	0.620	0.158	1.782	0.120	1.040	0.266	2.478
Content Cross	25.297	63.663	68.209	57.767	79.235	60.479	84.261	88.198	69.580	80.998	77.853	82.802	69.861
Indirect Teacher Response to Student Comments	2.029	5.775	3.185	9.856	7.859	9.720	5.565	5.292	3.920	11.345	5.564	1.365	5.956
Direct Teacher Response to Student Comments	1.120	5.298	4.206	6.818	4.312	3.372	2.887	1.973	4.667	7.032	6.082	4.579	4.361
Student Talk Following Teacher Talk	5.344	11.684	7.732	16.829	11.957	13.021	8.452	6.539	8.409	18.199	11.942	6.024	10.502
Student Talk Following Student Talk	14.039	6.113	5.484	10.975	3.609	9.613	1.754	2.336	10.683	4.138	5.859	9.928	7.869
Silence or Confusion Following Teacher of Student Talk	17.463	5.979	3.839	5.184	4.375	7.948	5.257	3.841	8.014	4.316	6.305	2.288	6.234
Total Silence or Confusion	54.260	16.090	10.821	8.801	10.208	20.461	10.814	7.310	17.053	8.211	15.049	5.798	15.406
Steady State Cells	53.636	51.091	65.782	43.073	51.227	43.126	61.694	67.605	59.172	38.398	56.269	78.222	55.774
3-3 Cell	0.000	0.136	0.086	0.234	0.062	0.107	0.309	0.052	0.143	0.000	0.075	0.000	0.100
9-9 Cell	0.140	2.648	3.465	8.567	0.612	1.454	0.412	0.156	6.551	0.473	2.743	1.828	3.004
Student Talk	19.275	17.788	13.207	37.696	15.557	22.625	10.197	8.866	19.083	22.328	17.792	15.792	18.363
Teacher Talk	26.470	76.127	75.976	53.508	74.239	56.919	78.994	83.829	63.870	69.466	67.164	78.265	67.068
Teacher/Student Talk Ratio	1.373	4.279	5.752	1.419	4.772	2.515	7.746	9.455	3.346	3.111	3.774	4.909	3.652

Table 38 is included at this point to summarize the teaching style exhibited by the Fall Quarter, 1969, group of student teachers. The reader may need to refer to the definition of terms in Chapter One for aid in their identification. A comparison of Table 38 along with its counterpart (Table 50) for the special Winter Quarter group (Group E) will follow later in the study.

Winter Quarter Student Teacher Number 1

An analysis of Winter Quarter matrix number one showed teacher-talk covered 72.107 percent of the time while student-talk covered 21.619 percent of the time. When these figures were compared to the averages for the Winter Quarter student teachers, teacher-talk was above average while student-talk was below average.

Each of nine cells in the matrix contained three percent of the tallies or more. Only two of these cells were steady-state cells. The (4,4) cell indicated the extended, deliberate type of teacher question. The (5,5) cell showed the amount of extended teacher-lecture. The other seven cells in the matrix were transition cells. They included the (4,8), (4,10), (8,2), (8,3), (3,4), (2,4) and (5,4) cells. Even though teacher talk was somewhat above average for Winter quarter, 1970, these transition cells showed the variety of ways it was used. The (4,8) cell showed the shift from teacher-question to student response, while the (4,10) cell showed that the teacher frequently needed to wait for a brief span of time for the students to respond. Both the (8,2) and (8,3) cells showed forms of teacher-praise following student-response. The (3,4) and (2,4) cells showed the transition from forms of praise by the teacher back to questions directed to the students. The (5,4) cell showed the shift from lecture to question.

TABLE 39

PERCENTAGE MATRIX FOR WINTER QUARTER STUDENT TEACHER NUMBER 1

	1	2	3	4	5	6	7	8	9	10
1					0.065					
2		0.324	0.971	3.366	1.878			0.650		0.650
3		0.195	0.777	3.431	2.719	0.065	0.065	0.324	0.259	0.130
4			0.065	4.208	1.295			11.975	2.072	3.172
5		0.130	0.259	5.502	23.431	1.036	0.065	0.777	0.971	0.389
6				0.259	0.583	0.389		0.130	0.065	0.389
7			0.065	0.130						
8		5.826	4.272	2.784	0.583	0.195	0.130	2.395	0.065	0.454
9	0.065	0.195	1.489	0.777	0.971	0.065			1.230	0.130
10			0.065	2.395	0.842	0.130		1.036	0.259	1.554
*T	0.065	6.667	7.962	22.784	32.492	1.878	0.259	16.700	4.920	6.279

*T indicates Total.

The almost total lack of criticism was a reflection of the skill of the student teacher. Several situations arose that would have resulted in direct criticism by a less knowledgeable teacher. This teacher used a style indicating partial acceptance and let the peer group make the correction.

Winter Quarter Student Teacher Number 2

An analysis of Winter Quarter matrix number two showed teacher-talk covered 59.774 percent while student-talk covered 27.111 percent. Teacher-talk was below average while student-talk was considerably above average for the Winter Quarter, 1970, group.

Each of eight cells in the matrix contained three percent of the tallies or more. Four of these cells were steady-state cells. They included the (4,4), (5,5), (8,8) and (9,9) cells. The (4,4) cell showed extended teacher-question. In this case, there was some difficulty with excessive teacher paraphrasing before the students were allowed to answer. The (5,5) cell showed a relatively low incidence of extended teacher lecture (15.326 percent). The (8,8) and (9,9) cells showed an unusual amount of continuous student involvement. There were also four transition cells. They included the (4,8), (8,2), (2,4) and (5,4) cells. The first three cells identified a pattern of teacher-question--student-response--teacher-praise and back to another teacher-question. The (5,4) cell indicated the transition from lecture to question.

TABLE 40

PERCENTAGE MATRIX FOR WINTER QUARTER STUDENT TEACHER NUMBER 2

	1	2	3	4	5	6	7	8	9	10
1										
2		0.274	1.588	3.011	1.861	0.055		1.697	0.055	
3		0.110	2.080	2.737	2.135			0.165	0.274	0.055
4		0.219		5.146	1.095			10.072	1.478	0.767
5		0.219	0.548	5.419	15.326	0.110		0.657	1.314	0.438
6					0.110	0.219		0.329		0.055
7			0.110	0.055						
8		6.325	2.245	0.986	1.259	0.165	0.165	14.724	0.438	0.603
9		0.384	0.986	0.438	1.807	0.055		0.055	5.246	0.329
10				0.986	0.438	0.110		0.219	0.493	0.876
*T		8.539	7.554	10.774	24.029	0.712	0.165	27.915	9.196	3.120

*T indicates Total.

An analysis of the (3,3) cell was especially interesting. This student teacher used this cell about two percent of the time. This was nearly twenty times as frequently as the average non-Flanders trained teacher Fall Quarter. The use of (3,3) cell is considered especially important by Flanders, Amidon and others. Its use is generally considered a reliable indicator of a superior teacher.

Winter Quarter Student Teacher Number 3

An analysis of Winter matrix number three showed that teacher-talk covered 76.861 percent of the time while student-talk occupied 16.964 percent of the time. These two figures represented the high and low mark in their respective categories for Winter Quarter, 1970. However, when these figures were compared to the untrained Fall teachers, one finds that about 25 percent of the Fall student teachers talked more while about one-half of the students talked more than the 16.964 percent of the time cited above.

Each of seven cells in the matrix contained three percent of the tallies or more. Only two of these were steady-state cells. They included the (4,4) and (5,5) cells. The (4,4) cell showed the use of extended teacher-questions, while the (5,5) cell showed extended teacher-lecture. The 35.219 percent spent in cell (5,5) was a high for the Winter Quarter student teachers, but only average when compared to the Fall Quarter group. There were five transition cells. They included the (4,8), (8,2), (2,4), (2,5) and (5,4) cells. The

TABLE 41

PERCENTAGE MATRIX FOR WINTER QUARTER STUDENT TEACHER NUMBER 3

	1	2	3	4	5	6	7	8	9	10
1				0.081						
2		0.324	0.687	4.766	4.362			0.283	0.081	0.445
3			0.162	0.445	0.566			0.081		0.041
4				3.918	0.687			11.188	0.364	2.303
5		0.445	0.081	5.534	35.219	0.445		0.243	1.778	1.091
6				0.122	0.283	0.485			0.041	0.081
7				0.243						
8	0.041	9.976	0.283	1.414	0.364		0.202	1.535		0.364
9		0.081	1.081	1.979			0.041		0.485	0.041
10	0.041	0.122		1.858	1.374	1.081		0.849	0.041	1.818
*T	0.081	10.946	1.293	18.458	44.831	1.010	0.243	14.177	2.787	6.180

*T indicates Total.

first four reflected a teaching style of teacher-question--student-response--teacher-praise followed by either another question or a shift into lecture. The (5,4) cell showed a shift from teacher-lecture to teacher-question.

Winter Quarter Student Teacher Number 4

An analysis of Winter matrix number four showed that teacher-talk covered 57.403 percent of the time while student-talk covered 36.058 percent of the time. This showed a relatively low level of teacher involvement with a high percentage of student involvement.

Each of ten cells of the matrix contained three percent of the tallies or more. This showed a wide variety of interaction present. Four of these cells were steady-state cells. They included the (4,4), (5,5), (8,8) and (9,9) cells. The first two cells showed the measure of extended teacher-question and lecture, respectively, while the last two cells were measures of different kinds of student participation. There were six transition cells. They included the (4,8), (4,9), (8,2), (5,9), (9,5) and (5,4) cells. The first three cells showed a teaching style of teacher-question--two kinds of student-response--and teacher-praise, while the (5,9) and (9,5) cells showed a type of teacher-explanation--student-question style not recorded before. The (5,4) cell was a shift from teacher-lecture to teacher-question.

TABLE 42

PERCENTAGE MATRIX FOR WINTER QUARTER STUDENT TEACHER NUMBER 4

	1	2	3	4	5	6	7	8	9	10
1				0.042						
2		0.126	0.709	1.793	1.208			0.376	0.459	0.042
3			0.417	1.543	2.126	0.042		0.334	0.501	0.084
4		0.042		3.085	0.501		0.042	9.213	3.335	0.959
5		0.084	0.209	5.544	16.716	0.376	0.084	0.584	4.127	0.792
6					0.376	0.459		0.292	0.126	0.167
7				0.126	0.167	0.042		0.042	0.042	0.042
8		4.252	2.001	2.668	1.084	0.251	0.209	6.295	0.084	1.960
9	0.042	0.167	1.668	1.334	5.544	0.084	0.084		7.337	1.001
10		0.042	0.042	1.043	0.834	0.167	0.042	1.668	1.251	1.501
*T	0.042	4.711	5.044	17.174	28.554	1.418	0.459	18.800	17.258	6.545

*T indicates Total.

Winter Quarter Student Teacher Number 5

An analysis of Winter matrix number five showed that teacher-talk covered 57.867 percent while student-talk involved 31.867 percent of the time. Teacher-talk was below average for Winter Quarter, 1970, while student-talk was somewhat above average for the same period. Approximately one-third of the student-talk was student initiated.

Each of twelve cells of the matrix contained three percent of the tallies or more. This showed a very wide variety of interaction present. Three of these cells were steady-state cells. They included the (4,4), (5,5) and (8,8) cells. The (4,4) cell reflected the amount of extended teacher-question while the (5,5) cell was a very low 7.309 percent of teacher-lecture. This teacher was able to teach a class without a great deal of extended talk. The (8,8) cell showed the amount of extended student-response. There were nine transition cells. This was one of the highest numbers of transition cells recorded in this study. The transition cells included the (4,8), (4,9), (8,2), (8,3), (2,4), (3,4), (10,9), (9,10) and (5,4) cells. The (4,8), (8,2) and (8,3) cells showed a teaching style of narrow teacher-question--student-response--and two different kinds of teacher-praise. The (4,9) cell showed a more general type of teacher-question followed by

TABLE 43

PERCENTAGE MATRIX FOR WINTER QUARTER STUDENT TEACHER NUMBER 5

	1	2	3	4	5	6	7	8	9	10
1										
2		0.556	1.203	4.811	1.573	0.093		2.359	0.556	0.972
3		0.417	1.943	3.516	0.833	0.047		0.972	0.648	0.556
4			0.139	3.655	1.111			11.148	4.580	1.342
5		0.093	0.463	3.146	7.309	0.186		0.787	1.064	0.787
6			0.047	0.139	0.093	0.324			0.232	0.093
7			0.047							
8		8.974	3.053	2.406	0.741	0.047	0.047	4.025		0.879
9		1.989	1.804	1.666	1.712	0.093			1.342	3.053
10		0.139	0.232	2.637	0.463	0.139		0.878	3.238	2.637
*T		12.165	8.927	21.971	13.830	0.926	0.047	20.167	11.656	10.315

*T indicates Total.

a more imaginative student-response. The (9,10) and (10,9) cells showed the extent of students offering their own differing ideas about the topic. The (5,4) cell was a shift from teacher-lecture to teacher-question.

Winter Quarter Student Teacher Number 6

An analysis of Winter matrix number six showed that teacher-talk covered 62.649 percent while student-talk covered 31.065 percent. Teacher-talk was somewhat below average for Winter Quarter, 1970, while student-talk was somewhat above average for the same period. Approximately one third of the student-talk was student initiated. Each of nine cells of the matrix contained three percent of the tallies or more. This showed a fairly wide variety of classroom interaction. There were four steady-state cells. They included the (4,4), (5,5), (8,8), and (9,9) cells. This showed the amount of teacher involvement in extended question and lecture as well as the student participation in the form of response or initiation. There were five transition cells. They included the (4,8), (8,2), (4,9), (2,4), and (5,4) cells. The (4,8), (8,2) and (2,4) cells showed a teaching style of teacher-question--student-response--teacher-praise. The (4,9) cell showed a different, more general, teacher-question followed by the student's own ideas as a response. The (5,4) cell showed a shift from lecture to teacher-question.