

Chapter Three

DESIGN, METHOD OF INQUIRY & METHOD OF ANALYSIS OF DATADESIGN:

The method of inquiry adopted a pre-test/post-test design to compare the effects of different forms of feedback on the scores obtained by groups of students on a schedule of interaction analysis. To this end, six groups of students were constituted as described later in the present section.

SAMPLING:

A random sample of 48 women student teachers has been drawn from a population of the B.Ed. unmarried women student teachers of a college of education for women, who have passed the B.A. Examination with History/political Science or both in the 2nd Division, having no previous professional qualification and experience of teaching; aged between 21 & 23 years; and following Hindi as their medium of instruction. Members of the group were later randomly assigned to the six treatment groups, A₁, A₂, A₃, A₄, A₅, and A₆. A description of these are as follows:

- A₁ Treatment group that made a self appraisal of teaching behaviour and has self-directed feedback for continual self improvement.
- A₂ Treatment group that received feedback from the peer.
- A₃ Treatment group that got feedback from the college supervisor.
- A₄ Treatment group that got feedback from the external observer. In the present investigation a class teacher of the practising school serves as an external observer.

- A₅ A control group having been taught interaction process analysis.
- A₆ A control group that has not learned interaction process analysis but traditional learning theory.

Further, for practice in teaching and to inquire into the chain of events into classroom and the effects of experiment, two student teachers from each group were randomly assigned to each of the four classes; 7th, 8th, 9th and 10th. The subjects for teaching (Social Studies, History and Civics), units of study, sequence of learning experience, the text books, number of teaching days, and total duration of teaching time within all treatment groups have been arranged in such a way as to ensure matched opportunity for learning.

INSTRUMENTATION:

The general term ' Interaction Analysis ' refers to many systems for observing and coding the verbal interchange between a teacher and his pupils and to study the chain of classroom events to understand and analyse the patterns of teaching and learning.

The assumption is made that teaching behaviour and pupil responses are expressed primarily through the spoken word as a series of verbal events which occur one after another and also the verbal interchange between a teacher and his pupils can be observed with higher reliability than can non-verbal behaviour. An observer sits in the classroom, listens to the verbal interchange between a teacher and his/her pupil and keeps a record of the flow of events on an observation form. The observer is trained to use a set of categories. He/She decides which category best represents each

event and then writes down the code symbol of that category. An analysis can be made of the frequency of events in each category or a profile of distribution can be drawn which shows how each event is a part of the chain.

In the present study, of the various systematic recording techniques, Flanders Ten Category system has been used as a research tool. This system was developed by Flanders (1960) and others at the University of Minnesota between 1955 and 1960; and is often used to record the presence or absence of particular behaviour patterns during a period of observation.

Figure I, lists ten categories; seven are used when a teacher is talking, two (category 8 and 9) are used when any pupil is talking and the last category is used to indicate silence or confusion.

So far as communication is concerned, these three conditions; (a) teacher talk, (b) pupil talk, and (c) silence or confusion, are said to exhaust all the possibilities.

Category systems which exhaust all possibilities are totally inclusive of all possible events, and since any event can be classified, a totally inclusive system permits coding at a constant rate throughout the observation. This is essential whenever an attempt is made to reach conclusions about the proportion of time spent in one or more categories.

Given ten categories, all verbal statements are classified every three seconds by a trained observer. The events are coded by using the number from one to ten which are written down in such a way as to preserve the original sequence.

The detailed description of the ten categories has been given earlier in the introductory chapter.

Using the system, the observer records the number of category fitting the behaviour going on during each three second interval in the classroom, this yields a list of category numbers representing the verbal behaviour. Raw data are bracketed off in pairs (Figure II). Data are summarised in a 10 x 10 matrix that exhibits the sequence of adjacent numbers (Figure III).

For instance, the first pair of bracketed data in Figure II, represents the 10 - 4 cell, (tenth row from top and fourth column from the left), the next pair 4 -10 cell, and so on.

A tally mark is placed in the appropriate cell of the matrix for each bracketed pair. Figure III, shows a 10 x 10 matrix with cell loadings (total number of tally marks in a cell) for the raw data shown in Figure II. A 10 is added at the beginning and end of the list of code symbols to mark the beginning and end of teacher-pupil interaction.

FIGURE - II

Information Sheet Indicating Bracketed Data Frequency and Percent of Use of Each Category of 10-Category System of Flanders' Interaction Analysis

	Category	Tallies	Percent
10]	1	0	0
[4]	2	2	10
[10]	3	1	5
[8]	4	3	15
[8]	5	4	20
[2]	6	1	5
[3]	7	0	0
[10]	8	2	10
[4]	9	1	5
[10]	10	6	30
[5]	Total	20	100
[5]			
[6]			
[5]			
[5]			
[4]			
[10]			
[9]			
[2]			
10]			

FIGURE - III

MATRIX

Interaction Analysis Data plotted in a 10 x 10 Matrix

	0	1	2	3	4	5	6	7	8	9	10
1											
2				1							1
3											1
4											111
5					1	11	1				
6						1					
7											
8			1						1		
9			1								
10					11	1			1	1	

Total Number of Occupied Cells = 15

OBSERVERS & PROCEDURE AND TRAINING OF OBSERVATIONOBSERVERS:

In the present study six observers including the present researcher have been engaged for observation of the teaching behaviour of the participating student teachers and to feedback the objective information regarding the specific patterns of their verbal behaviour on a schedule of interaction analysis.

Student teachers during their practice of teaching, seek information regarding their teaching behaviour and teaching effectiveness from the college supervisor, members of the peer group, and from the school teachers teaching to the classes that have been selected for the purpose of practice in teaching in teaching. Thus in the present study the members of the observation team have been drawn from among the college lecturers, peer group and teachers of the practising school. Three lecturers, one peer, one teacher of the practising school and the present researcher form the observation team.

In the treatment Group A_1 , the present researcher observes the teacher pupil interaction, prepares the matrix and presents it to the members of the group for the individual study of the same and decide independently steps for further self improvement. The members of the treatment group make a self appraisal of their behaviour and develop a skill for putting to use the self directed feedback.

In the treatment Group A_2 , a peer using the technique of Interaction Analysis helps a colleague understand, study and change her behaviour by evaluating their individual performances.

In the treatment Group A₃, the college supervisor is the provider of feedback.

In the treatment Group A₄, an external observer (presently a teacher of the practising school) acts as an observer to analyse and feedback information of teaching behaviour to the members of the treatment group.

In the treatment group A₅, (control group taught and trained to use interaction process analysis) a college lecturer acts an observer. But no information is provided to the members of the group regarding their teaching behaviour.

In the treatment Group A₆, (control group taught traditional learning theory and not the interaction process analysis) again a lecturer from the college acts as an observer. But no information is conveyed to the members of the group regarding patterns of verbal teaching behaviour.

TRAINING OF OBSERVERS:

The present researcher was trained in the use of the interaction process analysis at the Centre of Advanced Study in Education BARODA, and he later trained the other five observers engaged in the present inquiry in the use of the Ten Category System Of The Flanders' Interaction Analysis.

The first step in the preparation for observation is to memorise the code numbers in relation to a key phrase or word which are underlined in Table I. This is followed by learning the ground rules, as shown in Figure V. The trained observer sits in the classroom in the best position to hear and see the participants.

The observer acts highly discriminating and codes without hesitation at the instant an event is recognized. He/She writes down this category number while simultaneously assesses the continuing communication. The observer continues at the rate of 20 tallies per minute, keeping the tempo as steady as possible.

Several observations have been made by the present team of observers for group training, discussion of common ground rules, each observer's understanding of her unique biases and meetings arranged to discuss unusual categorization problems. This was followed by independent observation and coding of classroom interaction by each member of the team for a period of ten minutes active interaction and then comparing it to estimate reliability by using the Scott's Method.

It was continued till a coefficient of reliability higher than .85 was obtained on four consecutive occasions. Scott calls his coefficient "PI" and is determined by the following formula.

$$\overline{II} = \frac{P_o - P_e}{100 - P_e}$$

Where P_o is the percentage of agreement, and P_e is the percentage of agreement expected by chance which is found by squaring the proportion of tallies in each category, summing these over all categories, and multiplying by 100.

METHOD OF INQUIRY:

The present investigation aims to study the general over all performance of six treatment groups, which includes a study of the

- (a) effects of feedback on the overall measure of performance,
- (b) mean differences in the performance score of the treatment groups,
- (c) trend of the trial gains.

The method of inquiry adopted a pre-test/post-test design and began with the observation and coding of classroom behaviour of each member of the sample for a period of twenty minutes active interaction using the Flanders Ten Category System. The usual 10 x 10 matrices were prepared and discussed with three of the four experimental groups by their respective supervisors who were the sources of feedback as defined in the present investigation. The members of the treatment group that made a self-appraisal of their teaching behaviour were observed by the present researcher, who prepared the matrices and presented these to the members of the group for individual study of the same. No information in the form of 10 x 10 matrix of analysis of the teaching behaviour was made available to the control groups.

The experimental groups have in common the fact that the student-teachers have laid down the goals of their teaching behaviour and intention. The appraisal is followed by attempts to improve classroom interaction. Six feedback sessions spread over a period of four weeks have been conducted as follows:

- Two sessions during the first week of practice in teaching.
- Two sessions during the second week of practice in teaching.
- One session during the third week of practice in teaching.
- One session during the fourth week of practice in teaching.

CRITERIORN VARIABLES:

The method of inquiry adopted a pre-test/post-test design to study the effects of interaction analysis feedback and compare its various types. To this end, six treatment groups were created and have been described earlier.

To help the participating student teachers understand their teaching behaviour and make comparisons, goals of behaviour to be achieved are to be laid down and an earlier decision has to be made regarding specific patterns of verbal behaviour that are to be studied and about which information needs to be feedback. In the present study the criteriorn variables selected are the total use of each category (with the exception of category 1 and 10) i/d, I/D, S/T, Flexibility and nine other specific variables as measured by certain matrix cells.

These variables are described more specifically as follows:-

1. Total use of category 2*
2. Total use of category 3*
3. Total use of category 4*
4. Total use of category 5*
5. Total use of category 6*
6. Total use of category 7*
7. Total use of category 8*
8. Total use of category 9*
9. i/d; Proportion of Indirect - to - direct teacher talk

$$= \text{Categories } \frac{1 + 2 + 3}{1 + 2 + 3 + 4 + 5 + 6 + 7}$$

* See Figure I for description of categories

10. I/D: Proportion of Response - to - Initiation
 = Categories $\frac{1 + 2 + 3 + 4}{1 + 2 + 3 + 4 + 5 + 6 + 7}$
11. S/T: Proportion of Student - to - Teacher talk
 = Categories $\frac{8 + 9}{1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9}$
12. Flexibility: Total number of occupied cells.
13. 2 - 2 Cell : Extended indirect talk (extended use of praise statements) as measured by 2 - 2 cell loading. (Area 'A' of Figure IV)
14. 3 - 3 Cell : Extended indirect talk (extended acceptance and use of ideas suggested by pupils) as measured by 3 - 3 cell loadings (Area 'B' of Figure IV)
15. Positive affective teacher talk as measured by the 1, 2, 3 block (Area 'C' of Figure IV).
16. Negative affective teacher talk as measured by the 6, 7 block (Area 'D' of Figure IV).
17. (TRR89):
 Instantaneous Teacher Response Ratio is the tendency of the teacher to praise or integrate pupil ideas and feelings into class discussions, at the moment pupils stop talking. It is calculated by adding the cell frequencies in rows 8 and 9, columns 1, 2 and 3, multiplying this sum by 100, and dividing the product by the total tallies in the cells of rows 8 and 9, columns 1, 2, 3, 6 and 7.

18. (TQR):

Teacher Questions Ratio is the tendency of a teacher to use questions when guiding the content oriented part of class discussion.

$$= \text{Category} \quad \frac{4}{4 + 5} \quad \times 100$$

19. (TQR 89):

Instantaneous Teacher Question Ratio is the tendency of the teacher to respond to pupil talk with questions compared to his tendency to lecture. It is calculated by adding the frequencies in cells (8 - 4) + (9 - 4), multiplying by 100, and dividing the total by tallies in the four cells (8-4) + (8-5) + (9-4) + (9-5).

$$= \text{Cell} \quad \frac{(8-4) + (9-4)}{(8-4) + (8-5) + (9-4) + (9-5)} \quad \times 100$$

20. 9-9 Cell:

Extended Student initiated talk as measured by 9-9 cell loadings. (Area 'E' of Figure IV).

21. PIR: Pupil Initiative Ratio

Proportion of pupil talk judged by the observer to be an act of initiation.

$$= \text{Categories} \quad \frac{9}{8 + 9} \quad \times 100$$

Categories 1 and 10 have been excluded in the present study on account of the following reasons:

Category I, was remarkably rare and infrequent in evidence in the present study. While coding the behaviour of the sample of study, category I presented some difficulty because of Flanders

rigorous requirements. Allowing the observers more latitude of inference created problems of inter-observer reliability.

Category 10: It was felt necessary to subscript it to distinguish between three states.

Confusion, as enthusiastic hub; hub; and actual silence when pupils are carrying out teacher instructions. This category which covers several states was not employed for drawing conclusions in the present study.

The feedback step should help the teacher determine why he did not achieve his teaching objectives. The teacher might want to study the matrix carefully, using the various areas of the matrix. After clarifying the specific skills needed to accomplish his teaching objectives, the teacher will practise them. In it the following five steps are involved:-

1. Selecting the appropriate objectives,
2. The skill session,
3. Data collection,
4. Feedback,
5. Practice or Reteach.

STATING OBJECTIVES:

The teacher selects the specific skill he needs to practise on the basis of the diagnosis of his teaching behaviour. He uses the Expanded Interaction Analysis Categories (given in Figure VI) to operationalize the specific skills he will practice. Let us say, for example, he has two skills to work on: questioning and acceptance, acknowledgement, clarifying and summarizing student ideas. Because of the need to get intensive practice with a

skill, the teacher would therefore practise one skill at a time; the first would probably use questioning as an example.

SKILL SESSION:

The teacher teaches a lesson that may include the following specifications;

A simple content objective that can be achieved in 10-15 minutes time and that would also be appropriate to asking different types of questions.

In skill sessions ten to fifteen students may participate as that would facilitate its cultivation.

Two or three each of the following four types of questions may be planned;

F - Factual, C - Convergent, D - Divergent, E- Evaluative.

If the objective as stated just above i.e. of asking questions so that pupils may respond or comply, is not achieved in skill sessions there is further need to repeat micro teaching.

DATA COLLECTION:

An observer, sits in the classroom in the best position to see and hear the participants when he finds that the participants are ready to perform the skill session. He used the Flanders' Interaction Analysis Category System to record the data. An observation of 15-20 minutes active interaction can provide a very comprehensive picture of the teaching behaviour of the participants.

FEEDBACK:

After the data has been collected, the observer prepares a usual 10 x 10 matrix and presents it to the participating teacher for

independent self study of the same and discover whether the spontaneous patterns of verbal behaviour which are observed are, or are not, consistent with the intention of the teacher. This information helps a teacher understand his teaching behaviour and determine why he did not achieve his teaching objectives. This information obtained by a teacher as part of carefully designed inquiry, would help in further exploration of his teaching behaviour. This design of inquiry leads directly to some planned comparisons. Thus the feedback information becomes systematic because the data are confronted, analyzed in terms of anticipated comparisons, and their meaning determined in terms of logical inferences.

Further, the interaction analysis feedback is more powerful because of its objectivity. Effective feedback information leads naturally to a next phase of inquiry. The analysis and resulting insight provide clues for deciding which of the several courses of action will be followed.

PRACTICE OR RETEACH:

The feedback information is put to use. The participating teacher develops a teaching model to achieve his teaching objectives which he could not achieve earlier in the skill sessions. Now he practises the specific skills to accomplish his teaching objectives. Reinforcement of certain behaviours increases and their likelihood of occurrence is more relevant to classroom teaching because it has consequences for how a teacher might act.

HYPOTHESES:

In the present investigation, the guiding hypotheses tentatively set up are as follows:

(A) There will be significant differences between the mean scores of the treatment groups in the form of interaction analysis in their general overall measures of performance for each treatment. More specifically these will be as follows:

(i) There will be no significant differences between the mean scores of the four experimental groups e.g.

$$H_0 : M_{T_1} = M_{T_2} = M_{T_3} = M_{T_4}$$

(ii) There will be significant differences between the mean scores of the four experimental groups and the two control groups e.g.

$$H_I : M_{T_1} > M_{T_5} \text{ \& } M_{T_1} > M_{T_6}$$

$$M_{T_2} > M_{T_5} \text{ \& } M_{T_2} > M_{T_6}$$

$$M_{T_3} > M_{T_5} \text{ \& } M_{T_3} > M_{T_6}$$

$$M_{T_4} > M_{T_5} \text{ \& } M_{T_4} > M_{T_6}$$

(B) There will be significant differences between the mean scores of the gains of six trials when averaged over the six treatments e.g.

$$H_I : M_{G_1} \neq M_{G_2} \neq M_{G_3} \neq M_{G_4} \neq M_{G_5} \neq M_{G_6}$$

METHOD OF ANALYSIS OF DATA:

The first step in the analysis of data was to determine the algebraic gains of the 21 dependent variables by subtracting the pre-test scores from each of the six post-test scores obtained after each session of feedback. Means and Standard Deviations were then determined of sets of trial gain scores for the dependent variables. In a number of cases the Standard Deviation was found to be larger than the mean which suggested skewed distribution.

Application of Hartley's F max test indicated the presence of serious departure of variances from homogeneity in several of the dependent variables. Since the principal method of analysis adopted was a repeated measure design for the analysis of variance; non-normality and heterogeneity of variance represent major violations of the assumptions on which the technique is based.

It was first necessary to normalise the scores. Several methods for the transformation of raw gain scores are available; namely, logarithmic, reciprocal and square root scores. A Report by Winer (1971), has suggested that of these the logarithmic transformation is not appropriate for the data of the above characteristics. Accordingly in the present investigation, raw gain scores were first converted to T-scores to remove the negative signs in certain cases followed by their normalization via transformation to logarithmic scores.

Following the observation of a significant value for the F-ratio, comparison between pairs of means have been made using the Tukey Method and values for q, referred to the studentized probability range. The comparisons are likely to lead to the identification of significant differences between treatments may in accordance with the hypothesis.

FIGURE - V

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G_R_O_U_N_D R_U_L_E_S

Because of the complexity of the problems involved in categorization, several ground rules have been established. These rules of observation aid in developing consistency in categorizing teacher behaviour. They have been useful in working in classrooms at all grade levels and in all subject matter areas.

RULE NO. 1:

When not certain in which of two or more categories a statement belongs, choose the category that is numerically farthest from category 5. This is true except when one of the two categories in doubt is category 10, which is never chosen if there is an alternate category under consideration. Because those categories farthest from the center (5) of the category system occur less frequently, the observer maximizes information by choosing the less frequently occurring category (except 10) when there is a choice. For example, if the observer is not sure whether it is a 2 or a 3, he chooses the 2; if in doubt between a 5 and 7, he chooses a 7.

RULE NO. 2:

If the primary tone of the teacher's behaviour has been consistently direct or consistently indirect, do not shift into the opposite classification unless a clear indication of shift is given by the teacher. The trained observer is in the best position to judge whether or not the teacher is restricting or expanding the freedom

OF action of class members. If the observer feels that the teacher's pattern of behaviour is generally one of expanding the freedom of students to act, a slightly more direct statement in a very indirect pattern may tend to look, in contrast, like a more direct statement than it actually is. On the other hand, he must remain alert to momentary shifts to one of the more direct categories. Conversely, if the observer feels that the teacher has been consistently restrictive in his behaviour, he is particularly carefully in his use of the indirect categories.

In observing this rule, the observer is reacting to the general tone of the teacher's influence, either direct or indirect, and does not use the opposing categories unless it is clear that the teacher has shifted from this more general pattern. He must, of course, be certain that the teacher has established a direct or indirect pattern before he categorizes consistently in either of the two areas. Clearly he must also be ready to change when the teacher obviously moves all the way up the system; that is, 1 or 2 from 6 or 7, or when the teacher moves all the way down to a 6 or 7 from a 2 or a 3. This rule is often called the rule of the unbiased observer; that is, the observer is operating in a climate of general direct or indirect influence, and although he is ready to move to the opposite set of categories, he must feel that the teacher has definitely moved to the opposite type of influence before he is willing to grant a change in interaction pattern.

RULE NO. 3:

The observer must not be overtly concerned with his own biases or with the teacher's intent. Rather, he must ask himself the

question, "What does this behaviour mean to the pupils as far as restriction of their freedom is concerned?" If, when the teacher attempts to be clever, pupils see his statements criticism of a pupil, the observer uses category 7, rather than category 2. If the teacher being sarcastic says how good the children are, again category 7 is used. If a statement intended as a question has the effect of restricting students' freedom so that it becomes a direction, then it must be classified as a direction. The effect of a statement on the pupils, then, and not the teacher's intent, is the crucial criterion for categorizing a statement.

This rule has particular value when applied to the problem of helping teachers to gain insight into their own behaviour. In trying to categorize their own tapes, teachers comment, "But I meant" or "I was really trying to get the pupils to talk more," or "I think that I wanted them to answer that question," or "I was trying to praise them" or "I ment to use that child's idea." All these examples indicate that the teacher is thinking about his intent rather than the effect of his behaviour on the class members.

The meaning and value of this category system for an individual teacher come from the attention it gives to the effect of teacher behaviour on the freedom of the class. Use of this criterion requires a great ideal of training, particularly when a teacher is categorizing a tape of his own teaching. He must learn to be more defensive about categorizing the behaviour, recognizing that there is absolutely no evaluation of good-bad orientation implicit in the category system. The question is simply, "What category best describes this particular bit of interaction?"

RULE NO. 4:

If more than one category occurs during the three-second interval, then all categories used in that interval are recorded; therefore, record a change in category. If no change occurs within three-second, repeat that category number. This rule is concerned with the situation in which statements from two categories occur during a three-second period. Generally an observer writes down a category number every three-seconds. The pace of recording is generally maintained at a constant level so that only one category number is written during this period.

However, if there is a change in categories during this interval, the observer records the change. Within the three-second interval, for the example, the teacher may ask a question, the child answers, and the teachers praises the child. The observer attempts to record all three of the categories. The fourth rule, therefore, is that a category number is recorded every three-seconds unless the teacher changes categories within the three-second interval. If he changes categories, or if more than one category occurs during the three-second interval, then all categories used in the time period are recorded.

RULE NO. 5:

Directions are statements that result (or are expected to result) in observable behaviour on the part of children. Examples of directions are " Go to the board, read question 3, go to your seat etc." Some teacher statements sound like directions but cannot be followed by observed student compliance. These statements often precede the actual direction; for example, " Let's get ready now

TO go to recess " (Orientation, Category 5), " Now Row Five, get their coats " (Category 6).

RULE NO. 6:

When the teacher calls a child by name, the observer ordinarily records a 4.

RULE NO. 7:

If there is a discernible period of a silence (at least 3 seconds) record one 10 for every 3 second of silence, laughter, board work, etc.

RULE NO. 8:

When the teacher repeats a student answer, and the answer is a correct answer, this is recorded as a 2. This tells the student he has the right answer and, therefore, functions as praise.

RULE NO. 9:

When the teacher repeats a student ideas and communicates only that the idea will be considered or accepted as something to be discussed, a 3 is used.

RULE NO. 10:

If a student begins talking after another student (without the teacher's talking), a 10 is inserted between the 9's or 8's to indicate the change of student.

RULE NO.11:

Statements such as " Uh uh, yes yes, all right, okay," which occur between two 9's are recorded as 2 (encouragement). These statements function as encouragement (the student continues talking after the 2) and are therefore classified as 2.

RULE NO.12:

A teacher joke, which is not made at the expense of the children is a 2. If the joke makes fun of a child, then it is coded as a 7.

RULE NO.13:

Rhetorical questions are not really questions, they are merely part of lecturing techniques and should be categorized as 5's

RULE NO.14:

A narrow question is a signal to expect an 8. If the student gives a specific predictable answer, this is an 8. If the child expands, documents, or justifies his answer, the observer should begin tallying 9's

RULE NO.15:

An 8 is recorded when several students respond in unison to a narrow question.

Use of these ground rules has been found to improve reliability. Observers considered to be ready for classroom observation need to be checked to determine the extent of the reliability of their observations. This reliability can be

defined in terms of inter-observer reliability (the agreement between two observers observing a period of classroom interaction or tallying a tape of that interaction) or in terms of self-reliability (agreement between recordings of two separate hearings of one tape session by a single observer.) Use of the Scott's coefficient affords an approximation of observer agreement, although it does not reflect the extent to which two observers agree on the sequence of categories they have recorded. What the Scott coefficient does is a general idea of the extent to which two observers agree on the amount of a particular category a teacher employs. For training purposes, of course, the observers need to have as much information as possible about their progress. Higher Scott's coefficient, after increased practice, indicate progress. No method is yet available for dealing with the problem of the reliability of sequential ratings.

SUMMARY:

The system of categories used to analyze verbal behaviour in the classroom has been described in some detail in this chapter in terms of its effect on the freedom of the students to respond. Steps in the observer training process were included as a part of the discussion about categorizing verbal behaviour, since trained observers are essential to the process of interaction analysis. These descriptions of categories and rules give the basis for the recording system.

THE EXPANDED INTERACTION ANALYSIS CATEGORIES

1. Acceptance of Student Feelings
 - a - Acknowledgment - recognizes a student's feeling
 - c - Clarification - relates expressed feeling to probable cause
 - r - Reference - compares expressed feelings to feelings of others or the teacher

2. Praise of Student Contribution
 - W - Without criteria - no reason for praise is given
 - P - Public criteria - criteria for praise is given and represents publicly accepted reason
 - P - Private Criteria - criteria given as teacher's own feelings or value

3. Acceptance of Student Ideas
 - a - Acknowledgment - first recognizes the student's idea by mentioning name of student
 - C - Clarification - rephrases or restates idea
 - d - Summarization - enumerates or organizes ideas of several students

4. Questions
 - f - Factual - asks for fact or specific information
 - c - Convergent - asks student to solve problem with specific information
 - d - Divergent - asks student to predict or speculate
 - e - Evaluative - asks student to express opinion, feeling, or judgment

5. Lecture

F - Factual - gives facts or information

M - Motivation - gives enthusiasm or interest to topic

O - Orientation - gives overview of material

P - Personal - gives teacher's opinion about subject being discussed

6. Giving Directions

C - Cognitive - intended to direct student on an intellectual task

d - Managerial - intended to direct physical activity related to managerial task

7. Criticism

W - Without criteria - no reason for criticism is given

P - Public criteria - criteria for criticism is given and represents a publicly accepted reasons

p - Private criteria - criteria given as teacher's own feelings or value

8. Student Talk Response

f - Factual - factual answer usually in response to 4F

c - Convergent - convergent answer usually in response to 4C

9. Student Talk Situation

d - Divergent - divergent answer usually follows a 4d

e - Evaluative - evaluative answer usually follows a 4C

i - Initiation - student makes statement without being asked a question

10. Silence or Confusion

.10 - Ten Convention - used to indicate a change in student speaker

s - Silence - pause of three seconds of silence Confusion - periods when no single speaker can be identified