

MEANING OF CLASSROOM INTERACTION ANALYSIS

Classroom interaction analysis refers to a technique consisting of objective and systematic observation of the classroom events for the study of the teacher's classroom behaviour and the process of interaction going inside the classroom.

Satya Pal Ruhela, in his book *Educational Technology*, writes that class interaction analysis may be conveniently divided into two parts:

- Verbal interaction
- Non-verbal interaction

Class interaction analysis has been applied in teacher education. It has proven useful in educational psychology and education courses as a tool for analysing teacher behaviour. Research on teacher-pupil interaction patterns has also provided the basis for education or educational psychology courses concerned with the teacher's role and behaviour in the classroom. Interaction analysis is also a valuable tool in courses concerned with observation skills. The greatest use of interaction analysis has been in student teaching. In such activities, the tool is used for

- Developing skill in observation of teaching
- Providing a tool for analysis of teaching
- Providing a tool for feedback about one's teaching
- Setting a framework for practicing and learning specific teaching skills.

DEFINITIONS OF INTERACTION ANALYSIS

Interaction analysis is defined as:

- A research procedure used to investigate classroom communication. It involves the use of a system of categories to record and analyse the different ways in which teachers and students use language. myopiczeal.blogspot.com/2005/03/17/definitions-of-words-in-our-glossary-of-terms/

- A quantitative research method, which codes the content of ongoing communication between two or more individuals, identifies the verbal or nonverbal features or functions of the stream of conversational elements. higherred.mcgraw-hill.com/sites/0073049506/student_view0/glossary.html

BASIC THEORETICAL ASSUMPTIONS OF INTERACTION ANALYSIS

The basic theoretical assumptions of interaction analysis are as follows:

1. Predominance of verbal communication
2. Higher reliability of verbal behaviour
3. Consistency of verbal statements
4. Teacher's influence
5. Relation between students and teachers
6. Relation between social climate and productivity
7. Relation between classroom climate and learning
8. Use of observational technique
9. Role of feedback
10. Expression through verbal statement

FLANDERS' SYSTEM OF INTERACTION ANALYSIS

Flanders et al. (1970) originally developed a research tool, Flanders' interaction analysis, using a coding system to analyse and improve teaching skills. The teaching-learning situations in the classroom involve interaction between the teacher and the student. The success of a teacher may be judged through the degree of effectiveness of his teaching, which may be objectively assessed through his classroom behaviour or interaction. Thus, a systematic or objective analysis of the teacher's classroom interaction may provide a reliable assessment of what goes on inside the classroom in terms of teaching and learning.

Categorization of Flanders' System

Of all the techniques of interaction analysis mentioned before in connection with their respective studies, Ned A. Flanders' system (Amidon and Flanders, 1963) is considered easy to handle and can be used as a feedback technique in teacher training. Flanders' system is an observational tool used to classify the verbal behaviour of teachers and pupils as they interact in the classroom. Flanders' instrument was designed for observing only the verbal communication in the classroom and non-verbal gestures are not taken into account. The basic assumption of the system is that in the classroom, the verbal

statements of a teacher are consistent with his non-verbal gestures, or rather his total behaviour.

Flanders has categorised the interaction of teachers and pupils in classrooms (Table 4.1). There are ten categories in the system. Out of the ten categories in the system evolved by Flanders, seven categories are assigned to teacher talk and two to student talk and the remaining one category classifies pauses, short periods of silence, and talk that is confusing or noisy. The seven categories assigned to teacher talk are again divided into indirect and direct influence. Categories 1-4 represent

TABLE 4.1 Categories in Flanders' interaction analysis

	<i>Influence</i>	<i>Categories</i>	<i>Behaviours observed</i>
Teacher talk	Indirect influence	Accept feeling	<ul style="list-style-type: none"> • Accepting and clarifying the feeling of the students in a non-threatening manner • Feelings may be positive or negative • Predicting or recalling feeling
		Praises or encourages	<ul style="list-style-type: none"> • Praising or encouraging student's action or behaviour • Jokes that release tension but not at the expense of another individual • Nodding head • Saying "go on", "good", etc.
		Accept ideas	Clarifying, building or developing ideas suggested by a student
		Asks questions	Asking a question about content or procedure with the intent that a student answer
Teacher talk	Direct influence	Lectures	<ul style="list-style-type: none"> • Giving facts or opinions about content or procedures • Expressing the teacher's own ideas • Asking rhetorical questions
		Gives directions	Giving directions, commands, or orders with which a student is expected to comply
		Criticises	Making statements intended to change student behaviour from unacceptable to acceptable pattern <ul style="list-style-type: none"> • Scolding someone • Stating why the teacher is doing what he/she is doing • Extreme self-reference

(Contd.)



TABLE 4.1 Categories in Flanders' interaction analysis (Contd.)

	Influence	Categories	Behaviours observed
Student talk		Pupil's response	<ul style="list-style-type: none"> • Talk by students in response to teacher • Teacher initiates the contact or elicits student statement
		Student talk initiation	<ul style="list-style-type: none"> • Talk by students, which they initiate • If calling on students is only to indicate who may talk next, observer must decide whether student wanted to talk
		Silence or confusion	<ul style="list-style-type: none"> • Pauses • Short periods of silence • Periods of confusion in which communication cannot be understood by the observer

indirect influence and categories 5–7 represent direct influence. Indirect influence encourages student participation and freedom of action. Direct influence increases the active control of the teacher and often aims at conformity and compliance. Direct influence tends to increase the teacher's activity and restrains student behaviour. The net effect is less freedom of action for the students.

The division of student talk into categories 8 and 9 provides a clue to the nature of freedom given to the students. Usually, but not necessarily, an excessive or above average pattern of direct teacher influence is associated with less student talk. An above average indirect pattern is associated with more student talk and this will be of self-initiated type. The use of only two categories to record all kinds of student talk neglects a great deal of information, but the major purpose of this system is the analysis of teacher influence.

The purpose of category 10 is to record pauses, silence and periods of confusion. This is not intended to record longer periods of silence or confusion that exists for more than two minutes.

The major feature of this category system lies in the analysis of initiative and response which is a characteristic of interaction between individuals.

However, the following ground rules are helpful to decide the proper categorisation of the interactive behaviours when the observer is faced with some difficulty.

The task of observation, recording or encoding is quite complex and needs sufficient training, practice and care on the part of the observer. For maintaining objectivity and reliability of the process, there are certain ground rules which have to be kept in mind by an observer.

Rule 1 When not certain to which two or more categories a statement belongs, choose the category that is numerically farthest from category 5. For example, for choosing between 3 and 4, choose 3 and for 8 and 9, choose 9.

Rule 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.

Rule 3 The observer must not be concerned with his own biases or teacher's intent.

Rule 4 If more than one category occurs during the three seconds interval, then all categories used in that interval are recorded; therefore, record each change in category. If no change occurs within three seconds, repeat that category number.

Rule 5 For silence longer than three seconds, record 10 for every three seconds.

Rule 6 A teacher's joke, which is made at the expense of children, is recorded as 7, but if the joke is not made at the expense of the children, it is recorded as 2.

Rule 7 If a student gives a specific predictable answer to a narrow question, it is recorded as 8 and in the case when a number of students respond collectively, it is also recorded as 8.

Rule 8 When the teacher calls a child by his name, the observer ordinarily records 4.

Rule 9 When the teacher repeats a student's answer and if the answer is correct one, this is recorded as 2.

Rule 10 When the teacher repeats a student's idea and communicates that the idea will be considered or accepted as something to be discussed, a 3 is used.

Rule 11 If a student begins to talk after another student, a 10 is inserted between 9's and 8's to indicate the change of student.

Rule 12 Reactions such as 'All right', 'Okay' are recorded as 2.

Construction of interaction matrix

After recording or encoding the classroom events into ten categories, the next task is concerned with the construction of an interaction matrix table. The matrix table consists of 10 rows and 10 columns.

The category number of the record sheet is tabulated in the matrix table. Each number is entered in the form of sequence pairs, being used twice, firstly as the first number and secondly as the second number. The rows of the matrix represent the first number in the pair and the columns, the second.

Suppose the observer has written down 6, 10, 7, 5, 1, 4, 8 and 4. As the interaction proceeds, the observer will continue to write down numbers. To tabulate these observations in a 10 × 10 matrix, the first step is to make sure that the entire series begins and ends with the same number. The convention is to add a 10 to the beginning and end of the series unless it is already present. The series becomes as shown in Table 4.2.

TABLE 4.2 Convention of observation

	2nd	4th	6th	8th	
10,6	10,7	5,1	4,8	4,10	
1st	3rd	5th	7th	9th	
Pair	Pair	Pair	Pair	Pair	

These numbers are tabulated in a matrix, one pair at a time (Table 4.3). The column is indicated by the second number, and the row is indicated by the first number. The first pair is 10-6; the tally is placed in row ten and column six cell. The second pair is 6-10; this tally is placed in row six, column ten cell. The third pair is 10-7, the fourth is 7-5, and so on. Each pair overlaps with the next, and the total number of observations, 'n', always will be tabulated by 'n-1' tallies in the matrix.

TABLE 4.3 Sample interaction matrix

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

If it is a correctly tabulated matrix, the sums of the corresponding rows and columns will be equal.

Interpretation of interaction matrix

The process of interpretation of interaction or observation data is called *decoding*. There are several ways of decoding a matrix. The first and simplest way is to convert the reporting into percentages in each cell. This is done by dividing each of the column totals, 1 through 10, by the total number of tallies in the matrix. This computation gives the proportion of the total interaction in the observed classroom situation in each category. A similar procedure is used to determine the percentage of total teacher talk that falls in each category, 1 through 7, by the sum of these seven categories.

The purpose of interaction analysis is to preserve selected aspects of interaction through observation, encoding, tabulation and then decoding.

1. The proportion of teacher talk, pupil talk, and silence or confusion: The proportion of tallies in columns 1, 2, 3, 4, 5, 6, 7, 8, 9 and column 10 to the total tallies indicates how much the teacher talks, the student talks and the time spent in silence or confusion. In general, an average of 68 per cent teacher talk, 20 per cent pupil talk and 11 or 12 per cent silence or confusion is expected.

2. The ratio between indirect influence and direct influence (i/d ratio): The sum of columns 1, 2, 3 and 4 if divided by the sum of columns 5, 6 and 7 gives this ratio. If the ratio is 1 or more than 1, the teacher is said to be indirect in his behaviour. This ratio, therefore, shows whether a teacher is more direct or indirect in his teaching.

3. The ratio between positive reinforcement and negative reinforcement (i/d ratio): The sum of columns 1, 2 and 3 is to be divided by the sum of the columns 6 and 7. If the ratio is more than 1, then the teacher is said to be good.

4. Student's participation ratio: The sum of columns 8 and 9 is to be divided by the total sum. The answer will reveal how much the students have participated in the teaching learning process.

5. Steady state cells: Table 4.4 shows the steady state cells along the diagonal from the upper left to the lower right. If these cells are heavily loaded, it shows that the teacher remains in a particular category for more than three seconds.

The cell with the highest frequency of the entire matrix is typically the 5-5 cell, which lies on this diagonal indicating that the teacher frequently stays longer than 3 seconds when he provides information through lecture.

6. Content cross cells: The cells corresponding to the numbers 4 and 5 in the column and the row are known as *content cross cells*. If these cells are overloaded they reflect the teacher's emphasis on the subject matter.

7. Constructive integration cells and vicious cells: Two areas that are most sensitive to the positive and negative aspects of

