CHAPTER THREE

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3.1   THE PROBLEM :

(a)   A brief background :

Teaching, conceived as an interpersonal interactive process which occurs in a formalised instructional situation in which the teacher carries on an organised series of acts so that learning in students eventuates, is a highly complex and intriguing process and can be described as a "polymorphous" activity which takes many forms with no limit to the activities it can involve. It is obvious, therefore, that systematic research in teaching is an extremely delicate and difficult endeavour.

For a long time serious research in teaching could not be planned because of atleast two reasons. First, we laboured under the belief that teaching is an art and not science and, thus, it could not be subjected to rigorous analytical scientific investigation. This poetic infatuation with the concept of teaching as an art and its attendant hangover lingers with some of us even today. If we are to develop a scientific

understanding of teaching process we need to have a serious second look at this popular belief that teaching is an art and not a science. Second, most of the psychologists and pedagogues believed that research in learning will provide an adequate body of knowledge that can be directly used in classroom teaching. Teaching was thus a 'mirror-image' of learning.

Fortunately, for the last three or four decades, the above reasons do not seem to have been impressing a group of researchers who have been making relentless effort to have a direct research attack on the complex problem of teaching. This search has been difficult and arduous and the result to date has been "chaotic, unorganised and self-serving" (Rosenshine and Furst, 1973). This 'largely unsuccessful history' can be attributed not only to the complex nature of the process of teaching being studied but also to the differences in conceptual frame-work and methodological approaches that characterise the work of different researchers in this area.

Research in teaching, which has been guided by the desire to find dependable answers to the problem of teaching and teacher effectiveness, and, thus, has a practical orientation, initially concentrated on the presage-product variables. The emphasis was on finding relationship between demographic and personality characteristics of the teachers and changes in their pupils' behaviours. The monumental work of Ryans and his associates (1960) is an example of one such attempt. Jangira and Sharma (1974) have reported some presage-product studies that have been conducted in India. One general conclusion that can be drawn from the results obtained in these studies is that

the attempt made todate has not been rewarding so far as our gaining an insight into the process of teaching is concerned. Even today we remain largely ignorant about how certain teacher variables are related to the changes he brings about in his students in the classroom. The possible functional relationship that might exist between teacher personality characteristics and student change is still unknown. Despite a considerable amount of research and a huge pile of data, the results have usually been not significant and often contradictory.

The consistent not significant trend reported in the findings of presage-product studies has, however, led researchers have a second look at the whole approach of research in teaching. Among some researchers there is a growing awareness to search for alternative research approaches. This growing awareness can perhaps be best summed as below even at the risk of repetition :

> "Of late, there is a growing consensus among
> researchers that it is the teaching not the
> teacher that is key to the learning of students.
> That is, it is not what teachers are like but
> what they do in interacting with their students
> in the classroom that determines what students
> learn and how they feel about learning and about
> themselves" (Bloom, 1972).

In the wake of this shift in emphasis in research in teaching an encyclopaedic catalogue of observational systems (Simon and Boyer, 1970) has grown and quite a number of survey and correlational studies have been conducted to find what our teachers do in interacting with their students in their class-room and how their teaching behaviours are related to student

change. Process-product studies in teaching focus directly
on finding relationship between teaching behaviour and pupil
learning. Enthusiasm in conducting process-product research
does not mean neglecting presage-product studies. In fact study
of teacher's attitude in relation to pupil learning is an
important research area that needs more attention than it has
received so far. Enthusiasm in process-product research does,
however, mean that at present, this appears to be a more promi-
sing approach to understanding the complex process of teaching
and teacher effectiveness.

Research effort adopting process-product studies is
yet to yield dependable knowledge and, one must admit, that,
by and large, its history has also been unsuccessful so far.
There, however, have been some modest gains. To sum them up
here we (i) now possess a large number of observational system
(ii) have a substantial body of descriptive and correlational
data about classroom teaching behaviours as well as their
relationships with pupil gain, (iii) can "programme" teachers
to exhibit desired patterns of classroom behaviour, (iv) are
becoming increasingly aware of the need for controlled experi-
mental studies in natural classroom settings.

The first flush of enthusiasm with classroom inter-
action studies is over. Despite some gains, researchers appear
to have emerged out of this short-lived enthusiasm with the
belief that conceptual frame-work and methodological approach
need rethinking and refinement. Perhaps future research approach
is going to be more complex. May be this is one of the few ways
to approach the complexity of the phenomenon—teaching. If our

goal is to develop a scientific understanding of the process of teaching, of finding how classroom teaching behaviours are related to changes in pupils so that teachers can be helped to be more effective than what they are today where do we go from our present research attempt?

There has been an increased realization among some researchers that one of the answers to the above question lies in conducting controlled studies of teaching in normal classroom situation. In fact, this approach holds a great promise to them. Controlled studies of teaching in normal classroom are concerned with process-product variables and may either be correlational or experimental in design. This realization is reflected in some of the recent writings. Jangira and Sharma (1974) have advocated for correlational and experimental studies. Rosenshine and Furst (1973) have suggested a research loop consisting of "(a) training teachers to use a certain package of materials, (b) using observational systems to describe instructional activities on variables considered important for the implementation of the specific programme and also on variables considered to have general educational importance, (c) studying the relationship between instructional activities and student growth (on a variety of outcomes) within those groups of teachers who are supposed to be using the experimental treatment, (d) changing training procedures and/or materials on the basis of these studies, and (e) conducting new studies to determine the effects of the modifications and to determine the new relationship between instructional activities and student growth." The sequence of these steps are not fixed. One might use the

results of experimental studies to develop new observational instruments. An example of this descriptive-correlational--experimental loop is the work of Nuthall and his associates (1973). In fact, this work of the Christ-Church group is an example of one of the most sustained research efforts and a well executed study in the area of teaching behaviour. Other isolated studies by Hutchinson (1963), Solomon (1963), Klienman (1964), Perkins (1965), Spaulding (1965), Miller (1966), Beseda (1972), Sharma (1972), and Lulla (1973) reflect some of the attempts made in this direction.

(b)   Statement of the Problem :

Do certain verbal teaching behaviour patterns eventuate in students' achievement more than others? The modest available literature reviewed in the preceding chapter suggest that that may be so. The assumption that controlled study of teaching in normal classrooms might provide some answer to this problem led the investigator undertake the present study. This study was entitled :

"A   Comparative   Study   of   Verbal   Teaching
Behaviour   Patterns   and   Students'   Achievement
in   Terms   of   Instructional   Objectives."

The main question raised in this study was whether or not certain verbal teaching behaviour patterns affect students' subject-matter achievement more than others. Review of the related literature presented in the preceding chapter provided some indication that variance in subject-matter achievement

may also be related to differences in some verbal teaching behaviour patterns. In order to seek answer to the question raised in this study, three selected verbal teaching behaviour patterns were experimentally manipulated in normal classroom situation and an attempt was made to infer their effect on students' achievement in cognitive domain measured in terms of hierarchy of instructional objectives of knowledge, understanding and application.

Three different verbal teaching behaviour patterns have been considered in this study as antecedent process variables. These three different patterns were obtained by observing classroom interaction of (a) a group of teachers 'programmed' in the theory and practice of classroom interaction analysis using the observational system selected in the present study. This group was designated as experimental No.1 group (E_1), (b) another group of teachers 'programmed' in the same way as E_1 but were further 'programmed' in greater and systematic use of verbal feedback and questioning behaviours. This group was designated as experimental No. 2 group (E_2), and (c) another group of teachers with no 'programming' as was done in (a) and (b). This group was designated as control group (C). The purpose was to achieve systematic variation in general indirectedness as well as verbal feedback and questioning in these three patterns of verbal teaching behaviours so that their differential effect, if any, on students' achievement measured in terms of instructional objectives of knowledge, understanding and application could be studied. Results of the related literature reviewed in the preceding chapter though often contradictory, suggest the possibility of

obtaining significant variance in students' achievement as a result of exposure to these differential treatments.

3.2   HYPOTHESES :

In this study the following null hypotheses asserting no true differences were tested :

1.1   There is no significant difference in mean achievement at knowledge level of students exposed to verbal teaching behaviour patterns of C and E_1 groups of teachers.

1.2   There is no significant difference in mean achievement at understanding level of students exposed to verbal teaching behaviour patterns of C and E_1 groups of teachers.

1.3   There is no significant difference in mean achievement at application level of students exposed to verbal teaching behaviour patterns of C and E_1 groups of teachers.

2.1   There is no significant difference in mean achievement at knowledge level of students exposed to verbal teaching behaviour patterns of C and E_2 groups of teachers.

2.2   There is no significant difference in mean achievement at understanding level of students exposed to verbal teaching behaviour patterns of C and E_2 groups of teachers.

2.3   There is no significant difference in mean achievement at application level of students exposed to verbal teaching behaviour patterns of C and E_2 groups of teachers.

3.1   There is no significant difference in mean achievement
      at knowledge level of students exposed to verbal teach-
      ing behaviour patterns of E_1 and E_2 groups of teachers.

3.2   There is no significant difference in mean achievement
      at understanding level of students exposed to verbal
      teaching behaviour patterns of E_1 and E_2 groups of
      teachers.

3.3   There is no significant difference in mean achievement
      at application level of students exposed to verbal
      teaching behaviour patterns of E_1 and E_2 groups of
      teachers.

3.3   TERMS DEFINED :

      Each concept included in the above hypotheses has been
operationally defined as follows :

1. **Verbal Teach-**   Those verbal acts of the teacher which
    ing Behaviour   are directed at achieving instructional
                             objectives and occur within the context
                             of classroom interaction. Taking atten-
                             dance is not verbal teaching behaviour.

2. **Pattern**   Following Flanders (1970, pp. 4), a
                             pattern is defined as a short chain of
                             events that can be identified, occurs
                             frequently enough to be of interest, and
                             can be given a label (or name) since
                             this often facilitates thinking, e.g. a
                             questioning pattern.

3. **Achievement**   Cognitive growth in a student resulting
                             from teaching.

4.	Knowledge Objective	Cognitive operations characterised by recall and recognition of facts, terms, definitions, concepts, principles, processes etc. It emphasizes most the psychological process of memory.
5.	Understanding Objective	Cognitive operations characterised by ability to translate, interpret and extrapolate.
6.	Application Objective	Cognitive operations characterized by the ability to apply ideas, rules of procedures and methods to new situations.
7.	Experimental No. 1 group (E_1 group) Teachers	Teachers "programmed" in the theory and practice of classroom interaction analysis using the observational system selected in the present study.
8.	Experimental No. 2 group (E_2 group) Teachers	Teachers "programmed" as in the case of E_1 group with additional programming in greater and systematic use of confirmatory and corrective feedback as also in asking cognitive memory, convergent, divergent and evaluative questions.
9.	Control group teachers (C Group)	Teachers not "programmed".

Terms E_1 group of students, E_2 group of students and C group of students mean three different groups of students who were exposed to verbal teaching behaviour patterns of E_1 group of teachers, E_2 group of teachers and C group of teachers respectively.

3.4   DELIMITATION

The scope of the present investigation was limited

to the following points :-

1.   This is a short range experimental study spread over teaching of 8 sequential lessons by each teacher in a unit in general science.

2.   Students' achievement in terms of instructional objectives have been measured immediately after the unit of instruction is over.

3.   In terms of hierarchy of instructional objectives in cognitive domain only three objectives of knowledge, understanding and application have been included as product variables for investigation.

4.   Trained science graduates teaching general science to 7th class serve as the sample of teachers.

5.   The study is restricted to 7th class students reading in some of the Hindi medium boys' higher secondary schools of Ajmer.

6.   For the purpose of obtaining statistical control, initial differences among students in intelligence and previous level of related knowledge only have been considered.

7.   Only verbal teaching behaviours have been considered.

8.   Only one interaction analysis category system has been used.

9.   Classroom interaction data have been collected with the help of trained live observers.