

CHAPTER ONE

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CHAPTER ONE

INTRODUCTION

1.1 THE PROCESS OF TEACHING :

Teaching, understood in its broadest sense, as a social interaction with the purpose of imparting knowledge or providing inspiration, is as old as human civilization. Teaching, understood as a social interaction in "classrooms in schools has developed during the past two or three millenia" (Gage, 1968). Teaching is highly complex and intriguing. "It is a difficult set of processes to analyse, hard to describe, and clearly complex and often subtle in its effects upon those we are attempting to teach." (Morrison, 1972).

To some extent its complex nature is reflected in the ways teaching has been defined by different thinkers. A hurried look at a few of these definitions may help clear this point. In Little Oxford Dictionary, teaching has been defined as "to impart knowledge or skill: give instruction or lesson; instil, inspire with." For Gage (1963) teaching is an "interpersonal influence aimed at changing the ways in which other persons can

or will behave." Skinner (1968) defines teaching as "the arrangement of contingencies of reinforcement under which students learn." Smith (1970) views teaching essentially as a system of "social action involving an agent, an end-in-view, a situation and two sets of factors in the situation—one set over which the agent has no control (e.g. size of a classroom and physical characteristics of the students) and one set which the agent can modify with respect to the end-in-view (e.g. assignments and ways of asking question)." Amidon and Hunter (1967b) define teaching as "an interactive process, primarily involving classroom talk, which takes place between teacher and pupils." Mitra (1972) suggests that teaching be viewed within the framework of classroom and defines it "as a series of acts carried out by a teacher and guided by the formulation of teaching task in a formalised instructional situation."

A small sample of the definitions of teaching given in the above paragraph reveals that teaching has been considered both in wider as well as in narrower sense. In its wider sense it is an inter-personal relationship entered into with the purpose of imparting knowledge and skill and thus changing the ways of behaving of others. Thus the sermons delivered by a priest as also a lecture by a social worker may be thought of as teaching. However, in narrower and specific sense teaching is considered as an interpersonal relationship characterised by the act of instruction in the formal situation of classroom. For those engaged in the study of teaching, this view of teaching should provide a frame-work within which to work.

Writing about the structure of teaching, Turner (1971) makes a subtle comment about attributes of teaching as follows :

"First, all teaching is dyadic - i.e., involves reciprocal, interdependent responding between at least two persons. That one of these persons holds the greater authority and has control of substantial reinforcements which can be delivered to or withheld from the other are common features of teaching.Second, there must be a gap between the performance of one of the persons, the pupil, and a performance standard held by the other person, the teacher.Third, the person holding the performance standard must engage in an hypothesized instrumentality to close the gap between the performance of the pupil and the performance standard."

By "hypothesized instrumentality" is meant that the teacher predicts and then selects certain response or responses which he believes will close the gap between his performance standard and the performance of the pupils he is teaching. Teaching eventuates in learning to the degree this prediction is true. In case this prediction is not true, specific teaching act has no value in relation to the goals set. This concept of "hypothesized instrumentality" is similar to what Smith (1970) calls "means", by which ends-in-view are reached. For him, "means" consist of two types of factors : (a) material mean--subject matter and instructional paraphernalia and (b) procedural mean--the ways subject matter and paraphernalia are manipulated and manouvered.

"Hypothesized instrumentality" or "means" are, therefore, primarily important in determining the degree to which the gap

between performance of pupil and performance standard of the teacher will be bridged. If the gap remains altogether unbridged, learning fails to take place despite the means adopted by the teacher and viewed as teaching activity by most of us. To be a teaching activity, it is not sufficient only to have a purpose or intention to bring about learning but that it must bring about learning. If it fails to achieve this, it is doubtful if the activity can be called teaching. No doubt, logically it is correct to accept that teaching may occur without learning but from the point of view of value judgement, teaching and learning are not independent. "Teaching is valued when it eventuates in learning and not otherwise. That is why we spend so much time worrying about teacher effectiveness" (Turner, 1971). The assessment of changes in the pupil, the outcome, which reflects degree of success or failure of teaching in using "hypothesized instrumentality" is most crucial to teaching and not trivial as some may believe. What is emphasized here is that 'end-in-view', in whatever degree it might have been achieved, is not independent of teaching. In any serious research in teaching, the study of changes in pupil(s) i.e., the outcome of teaching, needs to be considered. In the light of this discussion, Mitra's (1972) more or less specific and operational description of teaching "as a series of acts carried out by a teacher and guided by the formulation of teaching task in a formalised instructional situation" needs a qualification with respect to the outcome of teaching--the changes in pupil behaviour, accomplishment of the end-in-view, the learning.

From the above discussion, teaching may be conceived as under :

- (a) it is an inter-personal interactive process,
- (b) it occurs in a formalised instructional situation,
- (c) the teacher carries on an organised series of acts,
- (d) the pupils learn.

A brief explanation of these concepts now follows :

- (a) By interpersonal interactive process is meant that it is a social situation consisting of interacting human beings. In this interacting process there is the agent--teacher, and a pupil or group of pupils. The interaction between them may take place in a number of ways. It may take place between teacher and the whole class, teacher and subgroups in the class, teacher and an individual pupil or pupil and pupil. Such an interactive process is characterised by a cognitive-affective climate typical of that interaction situation. The nature and quality of this climate is determined primarily by the behaviour of the teacher. It is his behaviour primarily that sets the pattern of this cognitive-affective climate. Various attempts have been made to analyze the pattern of this climate with a view to understanding the nature of teaching.
- (b) Formalised instructional situation has atleast two connotations. First it is 'contractual' in nature with not only well defined roles of the teacher and the

pupil but also an acceptance of these roles by those involved in the process of teaching. Making psychology of economic behaviour as the base, Mitra (1972, pp.32) defines this 'contractual relationship' as a situation where 'one demands and the other supplies.' In a teaching-learning situation the demand is from the side of the pupils and the supply is from the teacher. This contractual relationship is a basic parameter of teaching notwithstanding the observation made by sympathisers of deschoolers who comment that in our today's school neither the pupils demand nor do the teachers supply. The second connotation of formalised instructional situation applies to the social institution where teaching is carried on. This institution today is the school and, within it, the classes with their teachers and students.

- (c) By the concept of teacher carrying on an organised series of acts it is meant that the activity of the teacher is not random and not taking place under the influence of simple chance. Rather the teacher arranges well-thought-of and planned activities in his classroom with the intention of providing learning experiences to his students. These planned activities are the means and include what Smith (1970) has called the 'material mean' and the 'procedural mean'. Material mean is concerned with 'subject matter and instructional paraphernalia' and procedural mean with the 'ways subject matter and paraphernalia are manipulated and

manouvered'. Certainly, there appears to be a great scope of variations of procedural mean which may be helpful for different types of learning outcomes in different sets of students. The decision of selecting series of acts is again intimately related to establishing learning outcomes on the one hand and devising methods of measuring and evaluating learning on the other. This is not to say that establishing learning outcomes and devising methods of measuring and evaluating learning are components of teaching process but that these are important functional variables in a total teaching-learning situation. While evaluating effectiveness of organised series of acts of the teacher, these two variables do come up for consideration and provide data about effectiveness of teaching.

- (d) Teaching devoid of the concept of pupil learning is meaningless from valuational view point. Even from contractual standpoint teaching has no value if nothing has been supplied by the teacher in response to the demands of the pupil. What for is there teaching if that does not lead to some learning? Conceiving teaching as independent of learning has no stand where formal attempts are made in teaching with a definite goal.

1.2 SOURCES INFLUENCING CLASSROOM TEACHING :

How should one teach? Answer to this question has come mostly from sources other than empirical research in teaching. Some of the important sources that have influenced teaching

practices in schools over the years are (a) personal experience as a learner (b) philosophical interpretation of thinking (c) theories of learning. The impact of these sources on teaching will now be briefly discussed :

(a) Personal Experience as a Learner :

The adage that one teaches the way one was taught during his school days is not only familiar but often true. We often defend our teaching by citing a number of instances from the classes of our teacher who taught us in our school days. We quote some of the examples that might have influenced us either way and, now, form a part of our vivid impression. These impressions are personal for a teacher, but they do influence the way he will be behaving in his classroom and the degree to which his students will learn. While teaching, he tries to cast himself in the model of his teacher(s), teach the way he thinks he was taught best and avoid teaching the way he did not like in some of his teachers. It appears a gradual process of modelling over the years as a student has influenced his teaching behaviour now. How much is he aware of this influence is perhaps not easy to answer categorically but that, at times, he does analyze it in this light is an indication that those personal experiences do form a part of his teaching repertoire.

(b) Philosophical Interpretation of Thinking :

Teaching may also be influenced by what philosophers have said about thinking. For example, the attempt of Kilpatrick to formulate method of teaching has its root in Dewey's theory

of logic and knowledge. Kilpatrick who advocated the project method suggested that teachers should involve learners in activity aimed at solving problems. These problems should be real to the learners and about which the learners feel genuinely concerned. The job of the teacher is to help students plan, execute and evaluate their work. It is suggested that even skills such as reading and multiplication could best be developed through the activities carried on during the participation in the project.

(c) Theories of Learning :

Theories of learning have profoundly influenced classroom teaching practices. A theory of learning attempts to provide answer to the question how learning takes place. As there is not one answer to this question, there are quite a few schools of thought about how an organism learns. Thus we have several theories of learning which, often, compete with each other. Some of these theories are the out-growth of experienced-based-speculations whereas others have grown out of systematic investigation of learning. A brief discussion of how these theories of learning have influenced teaching practices may be in order at this point.

Earlier theories of learning that have greatly influenced teaching practices are (i) theory of mental discipline (ii) theory of natural unfoldment and (iii) theory of apperception. Theory of mental discipline, which itself derived its psychological basis from faculty psychology, propounded that training the mind through exercise strengthened mental faculties in the

same way as physical exercise strengthen bodily muscles. The process of teaching should, therefore, attempt to increase these mental faculties. Consequently, curricular experiences provided to students were selected on the basis of their utility to strengthen the mental faculties and methods adopted to provide these experiences were guided by this consideration of disciplining the mind which often included even severe punishment. Theory of natural unfoldment stems from the belief that man is naturally good and dynamic. Rousseau expounded this view point. Pestalozzi and Froebel applied this point of view in their pedagogical thinking. Teachers were urged to permit freedom to their students, so that their minds could unfold themselves naturally. Imposition of ideas and beliefs were forbidden as that would stand in the way of this natural unfolding of the mind. Theory of apperception is idea-centred. Apperception is a process of associating new ideas with the old ones. Herbart, using the concept of apperception as the base, suggested that real work of teaching was to aim at formation of apperceptive mass. The task of teaching is to link present appropriate experiences with background experiences. The teachers should start with the experiences which pupils already have and enrich these experiences. Teacher colleges are familiar with the Herbartian steps of "preparation, presentation, association, generalization and application" (Samuel Ball, 1970) that they have been demanding from their students to follow religiously in their lessons.

Some of the learning theories that were developed in this century and have influenced teaching are (i) S-R bond

theory (ii) Classical conditioning (iii) Reinforcement theory and (iv) Insight theory. S-R Bond theory with its implication for teaching was developed and popularised by Thorndike. As is well known, this theory assumes that in learning, specific responses get linked with specific stimuli. This S-R bond, according to Thorndike, has a neural basis and is formed by random trial and error. The famous laws of learning propounded by Thorndike found ready acceptance in classroom practices. In classical conditioning, an organism learns to respond to a new stimulus in the same, or similar way it responds to the old, unconditioned stimulus. Basically there is stimulus substitution. Skinner defined reinforcement in operational terms. Any stimulus is reinforcer if it increases the probability of a response occurring again. Basically there is response modification in this learning theory. One of the greatest contributions of Skinner is application of his theory to the development of the field of programmed instruction. This approach to auto-instruction is not only a new approach to instruction but is also a challenge to age-old classroom teaching practices. The Gestalt-field definition of insight is a sudden awareness of meaningful relationship between objects, situation and processes. When confronted with a problem, learning often occurs through insight. Teachers are exhorted to arrange experiences for their students, so that they are able to see relationship and thus learn. More recently works on modelling (Bandura, 1963), principle learning (Gagne, 1965) and problem solving (Ausubel, 1968) appear to be potential sources of learning theories that can influence teaching practices.

1.3 THEORY OF LEARNING OR THEORY OF TEACHING

The belief that knowledge of learning theory can be directly used in teaching is exemplified by this statement, "a given theory of learning implies a set of classroom practices. Hence, a theory functions as an analytical tool; its exponents can use it to judge the quality of a particular classroom situation" (Bigge, 1964). This view is held by many who think that theory of learning is adequate for teaching. If we have an adequate theory of learning, then the teacher must make use of that theory. Teaching must thus, be a kind of "mirror image" of learning.

Learning theorists believe that research findings on learning can provide a set of principles that can be applied to the instructional process. Thorndike's suggestions as to how to apply his laws of learning in classroom teaching still have a profound influence on practising teachers. Among the recent psychologists are Skinner, Cronbach and Gagne who hold that learning theories have the potential for developing the psychology of teaching.

The outstanding contribution of Skinner (1954) has been in the area of programmed instruction. Cronbach (1963) holds that there are seven elements of learning, viz; situations, personal characteristics, goal, interpretation, action, consequences and reaction to thwarting. Also, he holds that any teaching situation is characterised by four problems, viz., organizing of curriculum, motivating the learner, providing for

individual differences and evaluation of teaching. He argues that seven elements of learning when combined with the four problems of teaching can present a model of instruction. Gagne (1965) has offered a model of eight types of learning consisting of signal learning, stimulus response learning, chain learning, verbal association, multiple discrimination, concept learning, principle learning and problem solving. These eight types of learning are arranged in a hierarchy from signal learning to problem solving and are basic to individual as well as classroom teaching.

Against those who insist that learning theories are adequate for developing psychology of teaching are those who hold that this position is not tenable. They point to the failure on the part of the learning theorists to come forward with adequate and comprehensive psychology of teaching. In spite of a number of theories of learning, classroom teachers have not been benefitted much. Gage (1964) argues that if our aim is to develop a science of teaching, learning theories will not help. We will have to study how in a teaching-learning situation, one ⁱⁿ⁻behaves in fluencing another individual to learn. What are the structures and components of such teaching behaviours that eventuate in learning, should be the concern of those trying to develop theory of teaching. Bruner (1966) thinks of a theory of learning as descriptive and suggests that a theory of teaching should be prescriptive. How learning takes place in an organism is quite different from how an individual should be taught. These two sets of body of knowledge are different with respect to the process studied as well as the procedure adopted to study

that process. Smith (1970) has pertinently expanded this idea :

"It is often assumed that if we know how learning occurs, we thereby know how to teach e.g., if we know how individuals solve problems, then we know how to teach by the problem solving method. To teach, in this view, is to see that the individual does the operations that problem solving requires. We cannot go directly from theories to practical applications because there are particular problems that arise with respect to both materials and procedures. To apply any theory one must understand the phenomenon to which it is to be applied.""It is just as necessary to understand the phenomenon of teaching as a condition of applying ideas and principles to it, as it is to understand the principles and ideas themselves. We must first identify and describe the dimensions of teaching behaviour before we can think of realistically about concepts and principles relevant to its control."

1.4 RESEARCH IN TEACHING :

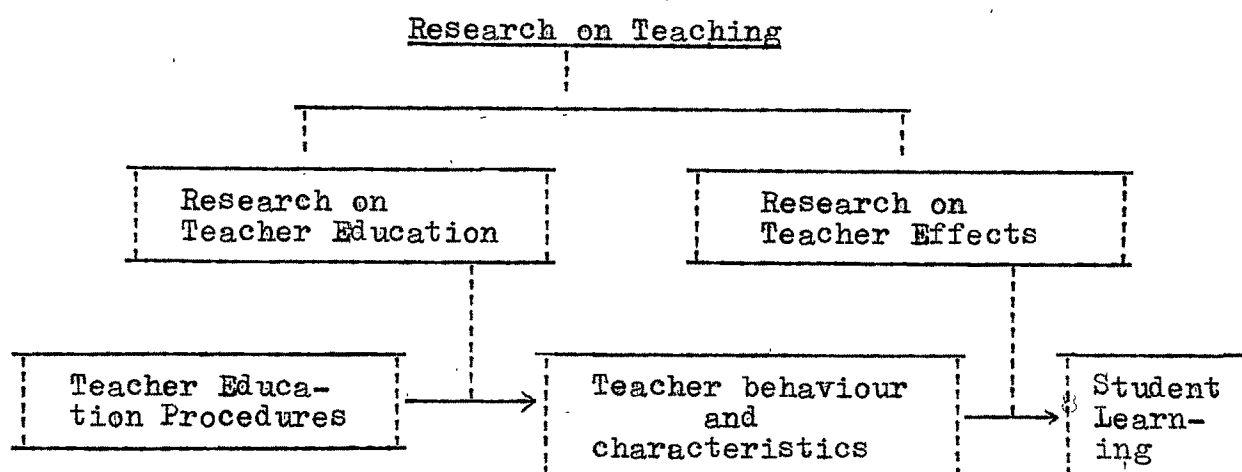
What is research in teaching? How is it related to research in learning? Attempts have been made to define the boundaries of research in learning and research in teaching. Gage (1968) gives a convincing answer to this problem by stating as follows :

"Research on learning deals with all the conditions, under which learning, or a change in behaviour due to experience, takes place. Research on teaching, on the other hand, deals with a subset of the conditions under which learning occurs in one person, namely, the conditions established by the behaviours of another person, called the teacher."

Thus it is clear that research on learning is global as it studies all the conditions that bring about changes in behaviour as a result of exposure to experience. As such, for the study of changes in behaviour the conditions may be arranged for human or infrahuman, in situations that may range from pure laboratory through natural settings. The chief focus of research in learning has been to try to learn how an organism learns. We are aware that different theoretical orientations backed by different experimental designs on learning have led to formulation of a number of theories of learning. Research in teaching, on the other hand, focuses on the study of only those conditions which are determined by the behaviours of the teacher in an organised instructional situation and as they are related to learning in the pupils.

From the above, it may be obvious that if research in learning represents the whole, research in teaching is a dimension of that whole--a dimension that concentrates on study of changes in pupils as a consequence of conditions set by teaching behaviours. Research in learning is a more inclusive and global field of study whereas research in teaching has a restricted and specific field of study, viz., the field of teaching which focuses on the teacher, teaching process and pupil change.

The Stanford Centre for Research and Development in teaching has suggested a conceptual paradigm of research in teaching. This paradigm is reproduced below (Gage, 1972) :



In the above conceptual framework, the domain of teacher behaviour and teacher characteristics is at the centre. This domain consists of variables which can be considered both as independent as well as dependent variables. If teacher behaviour and characteristics are considered as independent variables and student learning as dependent variables, then we have research on teacher effect (Gage prefers to talk of teacher effect and not effectiveness in order to avoid value judgement and maintain neutral attitude of the researcher). On the other hand, if teacher education procedures serve as independent variables and teacher behaviour and characteristics as dependent variables, then we have research on teacher education. Here teacher education procedures include selection procedures of teachers, information input and skill development training etc., as independent variables. Accepting the above paradigm as a conceptual framework, research on teacher effectiveness can be conceived in terms of presage, process and product variables. These terms were first used by Mitzel (1960). Presage variable is one that exists and is measured before the teaching starts, as for

example, measuring a teacher trait of warmth towards pupils. The corresponding process variable of warmth towards pupils would be some behaviourally specified measure of warm acts while teaching. Product variable in this case would mean an educational outcome such as pupil learning or change in attitude logically related to teacher warmth. Research on teacher effectiveness has considered these three variables in the following manners :

1. Study of presage - product variables
2. Study of presage - process variables
3. Study of process - product variables

Rosenshine and Furst (1971) make a distinction between process-product studies and experimental classroom studies. According to them process-product research includes "correlational" studies only in which "naturally occurring behaviours" are related to student outcome measures whereas in experimental classroom studies the "experimental teachers are trained to exhibit, specific instructional behaviours" and their effect on pupils are compared with effect on pupils taught by control group teachers. However, so far as the present investigation is concerned, such distinction has been avoided because if process-product studies try to relate "observed teaching behaviour to student change measures" (Mitzel, 1960) then they should include both the correlational as well as experimental classroom studies. If a study focuses on finding relationship between observed teaching behaviour and student change it may be included under process-product research irrespective of whether one is observing "naturally occurring" teaching behaviours or treatment induced

teaching behaviours. When conceived in this sense, process-product studies can either be correlational or experimental in design.

Research in teaching has been going on almost as long as research on learning (Gage, 1968). Some studies were conducted in 1910s and 1920s and quite a few more made during the 1930s. Since early 1950s research in teaching has indeed become extensive both quantitatively as well as qualitatively. Research in teaching has been guided by the desire to find dependable answers to the problem of teacher effectiveness. The quest, which has a practical outlook, is to find answer to the question of "how to define, identify, measure, evaluate and train for teacher effectiveness." It is a quest for finding ways and means of discriminating more effective teaching from less effective teaching, to find out elements of teaching behaviour as they are related to pupil change. Looking at the role of a classroom teacher in our contemporary educational scene, the problem of research in teaching with its emphasis on studying teacher effectiveness is not an idle one. Exposure to good or bad teaching is in the lot of all those who, in our society, are to go through the process of formal schooling. That research in teaching has a practical orientation right from the beginning is illustrated by the research attempt of Stevens (1912) who investigating questioning practices as a measure of "efficiency of instruction" concluded--rather hastily--that "a large number of questions is an indisputable index of bad teaching (except in some modern language and developmental lessons).... a small number of questions does not necessarily indicate good teaching."

Despite its long history, research in classroom teaching has been largely unsuccessful. "We remain very largely ignorant of how teachers affect the intellectual and emotional development of the pupils they teach, and more significantly we remain very largely ignorant of how best to go about developing this knowledge" (Nuthall and Church, 1973).

The trend of research in teacher effect, as conceived in Gage paradigm, has been broadly classified by Mitra (1970) into (a) Criterion approach and (b) Interaction approach.

(a) Criterion approach is "concerned with the criteria of teacher competence which are then sought to be predicted by a set of variables involving teacher personality and its antecedents and environmental or situational factors. Teaching enters into this model only as a secondary variable and in a global manner, chained to the antecedent variables of personality and situation on the one hand, and to the consequences of teaching, leading to some measurable degree of effectiveness as defined by a set of criteria, on the other hand". In this approach the focus is to find relationship between criteria of teacher competence and his personality and demographic characteristics. For example, an attempt to discover relationship between achievement (reflecting one of the criteria of teacher effect) and teacher emotional adjustment (reflecting his personality characteristic) may be classified as belonging to criterion approach of research in teacher effect. For Mitzel (1960) this approach includes primarily the study of presage - product variables. Presage variables encompass teacher characteristics such as his attitudes,

educational view points, emotional adjustment and intelligence etc., which are, what Mitra has termed, "teacher personality and its antecedents and environmental or situational factors." Product variables, on the other hand, encompass the "consequences of teaching," some educational outcome logically related to presage variables. Product variables may be more learning, pupil attitude change, pupil motivational change etc., assessed with the help of relevant criterion measures.

Research in teacher effect using criterion approach has relatively a long, voluminous and at the same time, not so successful history. These studies have concentrated primarily on investigating two categories of teacher characteristics as they are related to different criteria of teacher competence viz. (i) teacher personality - characteristics such as sense of humour, sympathy, enthusiasm, emotional adjustment and (ii) teacher biographical and test data such as age, sex, teaching, experience, intelligence quotient, social status. The criteria of teacher competence often used in these studies have been student or supervisor ratings of teaching, increased participation of students in academic pursuits or student achievement. An example of this approach to research in teacher effect is the monumental work of Ryans and his associates (1960). In India some isolated studies have been done, as reported by Jangira and Sharma (1974), in which attempts were made to find relationship between teacher variables and teaching efficiency. For example, study of Samantaroy reported in the above survey showed a positive relationship between teacher adjustment and teaching efficiency.

(b) Interaction approach, on the other hand, "considers teaching process more directly, but considers it as classroom social interaction. The teacher in a class of students does something and the pupils do some other things. The focus is on an accurate description of this sequence of classroom events of teacher-pupil interactional behaviour. Here the emphasis is on what actually goes on in the classroom" (Mitra, 1970). Paying direct research attention to teaching is about four decades old if we take work of Barr (1929) as the beginning, although some earlier isolated instances of such effort are found in the studies of Stevens (1912) who investigated questioning practices as a measure of instructional efficiency, Horn (1914) who developed a system for recording participation of pupils in different kind of classes and Puckett (1928) who developed a system for observing and recording various kinds and levels of verbal participation by pupils. Wrightsone (1934) used code entries for nine specific units of verbal behaviour. His emphasis was on developing an instrument for research workers studying the "experimental social-psychology of the classroom." Round about the mid-century interaction approach to studying teaching started gathering accelerated pace. This was due to a number of reasons, the most important being the growing feeling among researchers in this area that this approach could take them nearer to the understanding of the complex problem of teaching than the criterion approach. This trend of shift in research emphasis from criterion to interaction approach has been summed up by Bloom (1972) as follows :

"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."

The focus in this approach is to study functional relationship between process of teaching as independent variable and product of teaching as dependent variable as against presage - product studies where functional relationship is searched between teacher variables and product of his teaching. The process of teaching is conceived in terms of interaction between teacher and pupils and amongst pupils themselves. This interaction, which is socio-psychological in nature, generates a classroom climate, the nature and quality of which "determines what students learn and how they feel about themselves." Various attempts have been made to study classroom interaction and this has led to the development of a new technique of study--the interaction analysis.

1.5 INTERACTION ANALYSIS :

As applied to classroom teaching, "the term interaction implies an action-reaction, or a two-way influence which may be between individuals (e.g. pupil-pupil, teacher-pupil, or teacher-target), or between groups or between materials and individuals or groups" (Tisher, 1972). The elements of interaction is usually inferred from the behaviours of persons engaged in interaction situation being studied. These behaviours may be verbal or non-verbal and contribute to the cognitive and affective dimensions of the classroom interchanges.

Interaction analysis is a technique to analyse the nature of classroom interaction and has developed, during the last two decades or so, from the need and motive to discover what goes on in classroom teaching. Flanders is considered by many as the chief exponent of interaction analysis. According to him "interaction analysis is a label that refers to any technique for studying the chain of classroom events in such a fashion that each event is taken into consideration. An observer sits in the classroom, or views a video-sound play-back, or just listens to a voice recording and keeps a record of the flow of events on an observation form" (Flanders, 1970). This is a technique that attempts to provide more objective data about what goes on in the classroom interaction. With the help of this technique it is possible to capture elements of the elusive process of teaching as well as the cognitive-affective climate this process generates in the classroom. It helps in capturing the quantitative and qualitative aspects of classroom interaction by studying its dynamics. According to Flanders (1970), interaction analysis serves the following purposes :

1. to study teaching behaviours by taking into account events that occur during classroom interaction,
2. to help a teacher develop and control his teaching behaviours. Planned acquaintance with one's patterns of interaction can not only help a teacher in acquiring an awareness of his teaching behaviour but also in manipulating and controlling his teaching behaviour. In fact, Ober and his associates (1971) have elaborated this theme of awareness and control of ones teaching

behaviour in a whole volume.

3. to discover the reason for the variations which occur in the chain of classroom events. This will help in understanding teaching behaviour and its relationships to classroom interaction and educational outcomes.

Beginning of interest in analyzing social interaction can be traced back to the work of Anderson (1939). He reported a study that aimed at developing reliable technique for recording dominative and integrative behaviour which teachers use with kindergarten children. He used the typology of "dominative" and "integrative" contacts to explain classroom interaction. Domination was defined as the behaviour of a person "who is inflexible, rigid, deterministic, who disregards the desires or judgement of others." On the other hand, integrative behaviour was characterised by being non-coercive, open minded and consistent with the scientific approach. Lewin and his associates (1939) reported a summary of a series of experimental investigation of group life under autocratic leadership and democratic leadership. Some of the findings were that hostility was 30 times frequent in the autocratic group as compared to the democratic group. Much of the aggression was directed towards scapegoats within the group and none of the aggression was directed toward the autocrat. Evidence indicated that lack of aggression was not caused by lack of frustration but by the repressive influence of the autocrat. Withall (1949) developed a technique for assessing the social-emotional climate in classroom. His category system included seven teacher statements. Categories 1, 2 and 3 were learner centred and categories 5, 6

and 7 were teacher centred. Category 4 was neutral with no influence on either set. Bales (1950) developed a 12-category system to analyse interaction in small groups and it has been found by him that these categories reveal differences between more effective and less effective problem solving groups.

1.6 OBSERVATIONAL SYSTEMS :

Since the work of Anderson (1939) many researchers have evinced keen interest in analysing classroom interaction. Among them, the work of Flanders stands prominent for its sustained effort. Different researchers, guided by theoretical frame-work of their own, have focussed their attention on describing certain aspects of what occurs in classroom interaction. Because of complexity of events that characterise classroom interaction, different investigators have designed their observational systems from a number of different perspectives. Most of them have concentrated on studying only verbal interaction with the result that most of the systems provide data about verbal communication only. Again some researchers have focussed on affective dimension of the classroom interaction, some on cognitive dimension and a few on both. The net result so far has been the development of ninety two observational systems (Simon and Boyer, 1970) which is one of the most significant development in the area of classroom research. Observational systems may be classified into two basic kinds :

(i) sign system and (ii) category system, (Ober et. al, 1971). A sign system consists of a list of behaviours and the observer goes on checking in some manner each behaviour that occurs

during interaction. The behaviour is checked once during the period of observation even if that behaviour occurred more than once. The Florida Taxonomy of Cognitive Behaviour developed by Brown and his associates is an example of a sign system (Simon and Boyer, 1970). The category system consists of list of classifications of behaviours. The observer at regular interval determines in what category the observed behaviour falls and records that category number. Thus the sequence of the behaviour events are preserved. Flanders Interaction Analysis Category System is an example of the category system. Underlying all these attempts are not only the motive to provide empirical basis for the development of more effective educational practices but also to provide tools for research in teaching. In the paragraphs that now follow a brief description of a few representative systematic observational systems is presented :

(a) Flander's Interaction Analysis Category System (FIACS) owes its origin, atleast in part, to earlier works of Anderson (1939), Lippit and White (1943) and Withall (1949). Anderson who studied dominative and integrative behaviour in classroom interaction not only developed a reliable technique to measures behaviours but also, later on, used it in understanding classroom climate. Research of Lippit and White investigated authoritarian, democratic and laissez-fair leadership. This work supported the findings of Anderson and his associates and thus emphasized the importance of considering social interaction in terms of dominative and integrative contacts. Following the analysis suggested by Withall (1949), Flanders devised a simple ten-category system for analysing classroom interaction. He conceives of teacher

exerting indirect or direct influence in the classroom and these concepts are parallel to the earlier concepts of integrative and dominative climates of Anderson (1939) and democratic and authoritarian leadership of Lippit and White (1943). Flanders' ten-category system, which measures affective dimension of the classroom communication, is presented in the following table :

Table 1.1

Flanders' Interaction Analysis Categories (FIAC)

T E A C H E R	T A L K	R E S P O N S E	1. Accepts feeling. . Accepts and clarifies an attitude or the feeling tone of a pupil in a nonthreatening manner. Feelings may be positive or negative. Predicting and recalling feelings are included.
			2. Praises or encourages. Praises or encourages pupil action or behavior. Jokes that release tension, but not at the expense of another individual; nodding head, or saying "Um hm?" or "go on" are included.
			3. Accepts or uses ideas of pupils. Clarifying, building, or developing ideas suggested by a pupil. Teacher extensions of pupil ideas are included but as the teacher brings more of his own ideas into play, shift to category five.
T E A C H E R	I N I T I A T I O N		4. Asks questions. Asking a question about content or procedure, based on teacher ideas, with the intent that a pupil will answer.
			5. Lecturing. Giving facts or opinions about content or procedures; expressing his own ideas, giving his own explanation, or citing an authority other than a pupil.
			6. Giving directions. Directions, commands, or orders to which a pupil is expected to comply.
T E A C H E R	I N I T I A T I O N		7. Criticizing or justifying authority. Statements intended to change pupil behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.

P U P I L	RESPONSE	8. Pupil-talk--response. Talk by pupils in response to teacher. Teacher initiates the contact or solicits pupil statement or structures the situation. Freedom to express own ideas is limited.
	INITIATION	9. Pupil-talk--initiation. Talk by pupils which they initiate. Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought, like asking thoughtful questions; going beyond the existing structure.
Silence		10. Silence or confusion. Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

First seven categories are related to teacher-talk, category 8 and 9 are related to pupil-talk and category 10 records silence or confusion in the classroom interaction. Out of seven teacher-talk categories, categories 1, 2, 3, and 4 are assumed to contribute to indirect influence in the classroom, categories 5, 6 and 7 are assumed to contribute to direct influence in the classroom. Observers can be trained to use this system after a brief training. Flanders (1970) has also suggested a 22-category system which he has developed by sub-scripting some of the categories of his basic 10-category system. He believes that subdividing these categories helps a researcher in investigating a unique problem. Thereafter, the data can be collapsed back to the basic system.

A number of studies using the basic 10-category system have demonstrated the usefulness of this system. For example, Buch and Santhanam (1970) reported the applicability of this technique in Indian situation. Many category systems have been

developed making Flanders' system as the base.

(b) Ober et. al. (1971) have suggested two observational systems - Reciprocal Category System (RCS) and Equivalent Talk Categories (ETC). The RCS was developed by Ober and the ETC by Bently and Miller. The RCS is a modification of Flanders' interaction analysis category system and is mainly concerned with socio-emotional climate of the classroom interaction. This system contains nine categories for the teacher talk and the same categories are applied for student-talk also. For example, category number 2 (Accepts: accepts the action, behaviour, comments, ideas, and/or contributions of another, positive reinforcement of these) is assigned to teacher talk and the same category is also assigned to student talk as category number 12. The assumption is that "for every teacher verbal behaviour that can either be observed in the classroom or theoretically conceived, there exists a corresponding student verbal behaviour" (Ober et. al. 1971). Category number 10 refers to silence or confusion. The ETC--Equivalent Talk Categories--is concerned with the cognitive dimension of the classroom communication. This system again contains 9 categories that applies to teacher talk as well as student talk. Category 10 is meant for pause and silence in which there is absence of verbalization.

(c) Amidon and Hunter (1967a) have suggested a twentyfour flexible categories system which is an extended version of Flanders' system. In seeking the extension of the categories the authors claim to have drawn from the work of Hughes, Taba

The authors think that the system can be used "as a feedback tool, to analyse one's own teaching, to think about and formulate questions, to role-play behaviours in the college classroom, to observe teaching patterns and to diagnose teaching problems."

(d) Bellack and Davitz (1963) made use of the theoretical framework suggested by Wittgenstein and developed a system of classroom verbal interaction for use in their study. It was assumed by them that verbal interaction in a classroom between teachers and students can be conceived as moves in a 'game' which follow certain implied rules of behaviour. A further assumption underlying their work was that "the meaning of a word is its use in the language." Thus the system of analysis developed by them focussed on the functions of language in classroom-communication. This system of analysis of classroom discourse considers six aspects of meanings viz., pedagogical, substantive, substantive-logical, instructional, instruction-logical and emotional.

Pedagogical meaning refers to the ways verbal statement of a person defines his function as a teacher in the classroom interaction. Four pedagogical moves identified by these researchers are structuring, soliciting, responding and reacting. Substantive meaning refers to the content/subject matter being discussed in the classroom. Substantive-logical meaning refers to the logical processes involved while dealing with subject matter discourse. Included in this are three logical processes viz., analytic, empirical and evaluative. Analytic category means defining terms or interpreting statements. Empirical

category means stating facts and explanations. Evaluative category includes giving opinion and justifying reasons in defence of an opinion. Instructional meaning includes classroom management and other procedures followed during classroom discourse. Instructional-logical meaning aspect has categories parallel to the categories under substantive-logical meaning. But the categories of instruction-logical meaning are related to instructional process. Emotional meanings include three categories, namely, valence (pleasant-unpleasant), potency (strong-weak) and activity (active-passive).

(e) Smith and Meux (1970) developed an observational system which is primarily concerned with the logical and semantic quality of teacher verbal behaviour. As empirically oriented philosophers, their work has focussed on logic of teaching, the logic of verbal transactions in the classroom. They have identified two basic forms of the unit of discourse viz., episode and monologue. An episode is defined as "one or more exchanges that comprise a completed verbal transaction between two or more speakers." A monologue is defined as "the solo performance by a speaker addressing a group." Their system contains thirteen logical operations out of which eight represent basic categories of analysis and the remaining five are used to identify entries in coding and not in describing the logic of particular episode. The eight basic categories of logical processes are defining, designating, classifying, comparing-contrasting, conditional inferring, explaining, evaluating and opining. "Smith's conceptualization of the logic of teaching, his views on the inter-relationships among language, logic, and

psychology; and his emphasis on rigorous empirical research have established significant guidelines for subsequent investigations in this area. In addition to the particular system of analysis he has developed, his emphasis on cognitive processes has provided impetus for other researchers interested in the study of classroom interaction" (Davitz, 1970).

(f) Davitz (1970) reports the category system developed by Gallagher and Aschner. Making use of the concept of "operations of thinking" which is one of the dimensions of the "structure of intellect" developed by Guilford (1956) on the basis of a factor analytic study of mental test performance, Gallagher and Aschner have presented five categories for analyzing classroom discourse. They are (1) Convergent-memory. This category includes such thought processes as recognition, rote memory and selective recall, (2) Divergent thinking refers to analytic and integrative cognitive processes that occur within a distinctly structural frame-work, (3) Evaluative thinking is concerned with judgements based on personal value, (4) Divergent thinking refers to cognitive processes that presumably involve initiative, spontaneity, ideational fluency, originality, flexibility and other related characteristics, (5) Routine is concerned with management and conduct of the class. It is not directly concerned with thought processes.

This system does not suggest the desirability of one or another cognitive process. The system is developed from psychological research of Guilford and is a useful tool for studying cognitive processes manifested in classroom interaction.

1.7 CONTEMPORARY RESEARCH IN CLASSROOM VERBAL INTERACTION :

The past twenty five years or so have been characterised by a great deal of research interest in the area of classroom interaction. As has been stated earlier, this display of keen interest arises out of the hope that, unlike the "Criterion approach", study of the process of classroom interaction might provide us a body of knowledge that will help us have a better understanding of the complex process of teaching. It is further hoped that the degree to which this hope is realised will have a corresponding consequence on the way teachers are trained as well as the strategies they adopt in interacting with their students in the classroom to achieve instructional objectives.

Reviewing the studies done in the area of classroom behaviour Kliebard (1971) gives two major lines of research concentrating on verbal behaviour in the classroom. These are (a) research concentrating on emotional climate of the classroom and (b) research concentrating on cognitive dimension of the classroom discourse. Emotional climate research operates essentially within the social-psychological frame-work and uses such descriptive terms as "authoritarian" and "democratic", Lippit and White (1943), "dominative" and "integrative" teacher behaviour (Anderson, 1939), "learner-centred" and "teacher-centred" behaviours (Withall, 1949) and "direct influence" and "indirect influence" (Flanders, 1970). Research on cognitive dimension of classroom interaction places emphasis on the intellectual level of discourse and uses conceptual units of analysis rather than arbitrary time-unit. The aim is to study the cognitive processes that characterise classroom discourse.

The research effort of Smith and Meux (1970) is the most significant example of this area of research. The observation system developed by them has already been described. They distinguish between "teacher-behaviour" and "teaching behaviour". According to them teaching behaviour "consists of those acts that the teacher typically performs in the classroom in order to induce learning". Other examples of research on cognitive dimension of classroom discourse are those of Bellack and Davitz (1963), Gallagher and Aschner (Davitz, 1970), Taba and her associates (1964).

The overall gains from research in classroom interaction so far has been as follows :

- (i) development of a large number of observational systems (Simon and Boyer, 1970) which have made it possible to obtain precisely quantified data about classroom discourse. It is hoped that these "new observational category systems will play the same role in the development of a science of teaching as the telescope and the microscope have played in the development of the physical and biological sciences" (Nuthall and Church, 1973).
- (ii) accumulation of a substantial body of knowledge about classroom teacher-pupil behaviour. We know more than ever before about how our teachers interact with their pupils while teaching. This knowledge is primarily concerned with verbal interaction patterns.

- (iii) research programmes have been developed to help teachers change their classroom behaviour using interaction analysis category system.
- (iv) a large number of correlational studies to find relationship between teaching behaviour and pupil change have been conducted in natural classroom situation. Some of these process-product studies which used 'high inference measures' have revealed that such teaching behaviour variables as cognitive clarity, use of variety of procedures, enthusiasm, business like manner, opportunity given to pupils, use of pupil ideas, structuring statements, general indirectness are related to student achievement.
- (v) an awareness about the need for conducting more controlled experimental studies in the area of teacher-pupil classroom interaction.
- (vi) a growing belief that it is possible to search for theories of teaching by conducting controlled research in classroom interaction.

Some of the gains of research in classroom teaching enumerated above give an indication of the progress made so far in understanding the complex process of teaching. This should, however, not create an impression that we are at the threshold of unravelling its complex nature. On the contrary, it may be confessed that we are still far away from the goal of finding an adequate answer to the problem of teacher effectiveness. This

failure has not only reinforced the attitude of the sceptics but has also produced a shade of disappointment among some of the researchers. Nuthall (1973) suggests that this state of affair should encourage us in devising other ways of looking at the data and of conducting research. He adds "it is foolish to give up because an immediate pay-off is not evident. Surely if scientific enterprise means anything in the educational context, it does not mean quick returns in the research based platitudes, but a procedure for coming to understand the genuine mysteries that confront us. And the nature of teaching is just such a mystery" (Nuthall, 1973).