CHAPTER I

INTRODUCTION

1.00 Rationale of the Study

The problem under the present study entitled ' An
Inquiry into Strategies of Classroom Teaching' is a piece
of experimental research. The objective of the study is to
find out the effects of three different strategies on the
development and retention of knowledge, comprehension,
and application as well as the total achievement of the
pupils of standard IX. The content of teaching has been
selected from Geography with classroom lecturing, question-
ing, discussion as verbal teacher behaviour and use of
behavioural objectives and instructional materials as
material directed teacher behaviour and pupil questioning
and answering as verbal pupil behaviour and use of behavioural
objectives and use of instructional materials as manipulative/
material directed pupil behaviour. Here the study tries to
identify an effective strategy, combination of several
teacher and pupil behaviours in a particular sequence, which
may help a classroom teacher to attain better pupil performance.

Any research study, not to speak of in education alone, is
hardly justifiable if it does not originate from the felt
need of the investigator, need of the discipline concerned
and if the results of the study do not contribute to the
growth of the discipline.

Education itself is a discipline which is founded on
philosophy, sociology, psychology, history and pedagogy.
In a particular country again, a system of education
evolves through different phases. In a country like India
in particular, which has had to pass through a kaleidoscopic
socio-political scene for centuries, education has become
a kind of diffused discipline. The picture has not been
happier during the post-independence period. Consequently,
several Commissions have been set up to recommend guidelines
for development of education at different levels. But the
bane of the whole process has been that prior to a
comprehensive implementation of the recommendations of the
earlier Commissions, another Commission has followed.
Whatever may have been the impact of these Commissions, it
has to be admitted that the average standard of education
is gradually falling as against any international standard
as well as against our previous one. The basic issue however,
in educational reconstruction is not to compare the
standards of today with those of the past or to determine

whether they are rising or falling. On the contrary, it should be judged by three interrelated criteria ; adequacy, dynamism and international comparability. Standard must be adequate in relation to the tasks for which it is intended, dynamic as it should keep on raising with the demands of higher levels of knowledge, skills or character which a modernising society seeks for, and it should be internationally comparable at least in those key sectors where such comparison is essential. Judged by these criteria, the existing situation appears to be far from satisfactory.

The essence of a programme of teacher education is obviously 'quality' and in its absence, teacher education becomes, not only a financial waste, but a source of overall deterioration in educational standards. The Education Commission (1964-66) attached the highest importance to this programme of qualitative improvement in reorientating the subject knowledge, vitalisation of professional studies and improvement in methods of teaching as well as in evaluation.

In practice, however, university education departments, colleges of education and different national and state level centres for teacher training are deploringly at a loss to formulate effective and adequate programmes for teacher education in absence of empirical evidences which would indicate the adequacy and effectiveness of the programmes.

The fact cannot be denied that research on teaching, both extensive and intensive is an urgent task to improve the standard of teacher education which eventually enhances the quality of education at large. The Education Commission (1964-66) recommended for establishing in selected universities, a department or institute or preferably a school of education to develop research and training programme in collaboration with other disciplines. Its main function would be to evolve better curricula as well as techniques of teaching.

The general picture as is revealed to us by the analysis of results is that more than 50% of the regular and 70% of the private candidates appearing in High School and Higher Secondary Examinations have been declared unsuccessful in recent decades. The failure of such a large number of students, particularly after they have been screened year after year by means of annual and other school examinations, is a lamentable reflection on our system and methods of education.

In this very context, Buch and Yadav in the Survey of Educational Research in India (1974) have suggested educational research as a necessary counterbalancing force and have provided the following guidelines :

'Educational research should aim at obtaining by
experimental methods, knowledge about educational
practices and processes which could be used for
reconstructing the educational programmes in our
country.' (p. 1)

The U.G.C. responded to this urgent task by founding

the Centre of Advanced Study in Education (CASE) in the

Department of Education, M.S. University, Baroda, in 1963.

Since then the CASE has been functioning as a research

institution at the national level.

The researches of very many types and areas conducted

so far in India will, however, disappointingly show that,

'Out of more than 700 studies abstracted, twenty one
only fall in the realm of teaching and teacher
behaviour.' (Jangira and Sharma, 1974, p. 42)

The neglect of research on teaching and teacher

behaviour may be attributed to the reasons of complexity

of the problem, and to an absence of adequate tools of

observation.

Lot of dissatisfaction has been expressed towards the

training provided to the teacher. The consumers are not

satisfied, and more than this, the trainees are not satisfied

with the training programmes. But curiously enough this

dissatisfaction has not led to significant researches in the

area of teacher education.

This is indeed a grim picture of education as a whole,

and in particular, of the standard of school education,

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teaching method followed, nature of training imparted, all of which are but interrelated problems.

Buch (1972) holds up the picture in a very unique way,

> 'The contemporary emphasis in research on classroom phenomena is towards paying more attention to teaching as distinguished from learning. Studies designed to analyze teaching acquire their rationale in the light of the process governing learning but a clear and definite understanding of the complex phenomena of teaching will be needed to ensure the desired learning outcomes. '

Gage (1972) defines research as a scientific activity aimed at increasing our power to understand, predict and control events of a given kind. All of these goals involve relationships between variables. Teaching, he says, on the other hands, may be defined as events, such as teacher behaviour, intended to affect the learning of a student. Given these concepts of research and teaching one can define research on teaching as the study of relationships between variables at least one of which refers to a characteristic or behaviour of a teacher. If the researcher is concerned with the teacher behaviour and its relationship with intended pupil learning then certain fundamental concepts regarding teacher behaviour arising in the classroom situation need clarification because it is the dearth of vocabulary and standardised definitions for which social science, specially education has not been considered

scientific as a discipline.

From preceeding discussion the rationale for the present study may be justified from several levels and viewpoints.

Firstly, the national context of education demands a change and improvement in the standard, as it is a process and agent of bringing change in the whole system.

Secondly, as there is an 'explosion of knowledge' constant restructuring and modernisation of curriculum, of method and evaluation at teacher education level are essential.

Thirdly, improvements in the above areas through research and application of the results in the classroom instruction promise to entail a remarkable gain in the standard of pupil performance in different areas of learning - cognitive, affective and psychomotor.

Fourthly, if teaching itself is to be built up as a separate science by its own merit there should be different types of researches, specially scientifically designed ones.

Fifthly, to help the classroom teacher to bring about intended change among the learners, strategies should be built up on the basis of the concept of teaching

and that of research and experimental findings.

Now, for bringing a change in any component of the educational system, the fundamental requirement should be an understanding of teaching itself. Mitra (1972) reinforces this idea by saying 'the aims, processes and evaluation of education are primarily associated with teaching and reasonably, therefore, the vital problems of education cannot be solved unless we look into the problems and processes of teaching.'

Processes of teaching, in turn, constitute the interaction of the behaviours of teachers and pupils as evinced during teaching-learning situations. The teachers should be trained to produce agreed upon teaching behaviours. Through this process of training the teachers should know the meaning and importance of effects of certain types of teaching behaviour. This would consequently demand a focal attention of and a constant endeavour from the teacher educators, whose final aim is to help the teachers to bring about the desirable changes in the pupils whom they teach. The teacher training programmes should ensure their effectiveness. Effectiveness of a teacher training programme has usually been examined by employing immediate criterion - achievement in training programme, mediate criterion - adjustment to school,

attitude towards teaching profession, and ultimate
criterion - performance of the pupils.

Acceptance of the performance of pupils as the
ultimate criterion requires the teacher educators to
help the teachers in locating and applying the much-
needed effective techniques of teaching. This is possible
only if teaching is analysed in a systematic and scientific
way. At this juncture it is desirable to consider the
viewpoint of Highet (1955) according to whom teaching
is an art. If teaching is an art, then it should be
possible to develop this skill among those who want to
become teachers. In both cases, a knowledge about the
nature and process of effective teaching becomes essential.
The same idea is expressed by Medley and Mitzel (1963),
'without definite knowledge of the nature of effective
teaching, it is impossible either to identify and
recruit those young born with this talent or to make
successful teachers out of young people born without it.'

Medley and Mitzel (1963) again point out that very
little has been contributed to the science of effective
teacher behaviour though a large number of studies related
to it have been completed. The reason they attribute is
due to the failure in incorporating objective measures of
teacher behaviours. They point out that the development

of the science of effective teacher behaviour is the most urgent research need of the teaching profession.

If teaching is regarded as a science then it should be possible to produce a particular set of behaviours again and again. Mitra (1967) is of opinion that the teachers can be programmed. Hughes (1973), in an experimental study, has reported that it was possible to present almost exactly the same lesson on different occasions. Experiments of this type and the knowledge of results, if transmitted to the teachers, may bring some fruitful change in their teaching facilitating an improved type of pupil learning. The responsibility of teacher educators is to provide trainees with this type of knowledge and to train up them in tune with predecided teaching behaviours. The whole training programme needs be restructured in the light of these research findings which has been repeatedly emphasized by Buch (1972).

The above discussions focus on one main aspect, that of developing a science of teaching. In order to establish the scientific laws of teaching. numerous experiments covering a wide range of subjects, grades of different duration and such other educational factors have to be conducted. The experiments may be done in the classrooms instead of in psychological laboratories. This fact has been

significantly stressed in the statement, 'educational researchers have not provided those trained teachers with a repertoire of teaching skills which indicate to a teacher that he increases behavior 'X' and/or decreases behavior 'Y' there will be a concomitant in the cognitive or affective achievement of his students. It is time to stop touching structural panacea and to begin developing the research which may produce knowledge. '

Present study has been completed in the context of national educational development and the need of research in teaching in particular.

1.1.0   The Nature and Concept of Teaching

The concept of teaching has changed quite a lot since its beginning. Teaching is now a misleading generic term. It covers so much that many of the terms and concepts are used interchangeably. If we analyse various definitions presented by different persons this will become more conspicuous. Chronologically, the names of the significant contributors to the concept of teaching may be listed as the following : Thorndike (1913), Morrison (1934), Brubacher (1939), English and English (1958), Smith (1961, 1963, 1971), Gage (1963), Hughes (1963), Green (1964), Turner (1964), Gagne (1965), Ryans (1965),

Macdonald (1965), Amidon and Hunter (1967), Searles (1967), Michael Oakeshott (1967), Flanders (1970), Smith and Meux (1970), Hough and Duncan (1970), Buch (1972), Mitra (1972) and Bidwell (1973).

The contributors to the definitions and concepts of teaching represent various disciplines and therefore sometimes create conflicting ideas to people concerned with teaching. If the definitions are presented in the same order as their names have been, one will be over-whelmed with the complexity of the ideas.

Considering this complexity, definitions and concepts have been classified by Sorenson and Husek (1968), Joyce and Weil (1972), Gage (1972), and Mitra (1972) into several groups.

Sorenson and Husek (1968), in their attempt to analyse teacher's role, specified six dimensions, such as, 'information giver, disciplinarian, adviser, counselor, motivator and referer.'

According to Gage (1972), teaching can be analysed on the basis of the types of teacher activities, such as, explaining, questioning, mental hygiene activities, demonstrating, house keeping, record keeping, assignment making, curriculum making, testing and evaluating and many other aspects of activities. Further, teaching can be

analysed according to the types of educational activities in which it is aimed at, e.g. affective, psychomotor and cognitive objectives. Teaching processes can then be classified according to the domain of objectives to which they seem primarily interrelated.

A third way to analyse teaching originates from the notion that teaching can be viewed as the obverse, or 'mirror image' of learning and therefore has components corresponding to those of learning processes. And another way to analyse teaching derives from families of learning theory - conditioning theory, modelling theory and cognitive theory. The activities in the classroom depend much on the basic teaching models, though ordinary teachers may not be aware of that model. Various persons have considered learning and teaching in many different ways. Attempts to develop models of teaching have been made on these considerations. Joyce and Weil (1972) have provided a list of models as given by various persons along with their basic orientations. Those can be classified into four groups; (i) those oriented towards social relations and towards the relation between man and his culture and that draw upon social sources, (ii) those which draw on information processing systems and descriptions of human capacity for processing information, (iii) those which draw on personality development, the processes of personal

construction of reality and capacity to function as an integrated personality as the major source and (iv) those developed from an analysis of the processes by which human behaviour is shaped and reinforced.

The social interaction sources emphasise the relationship of the person to his society or his direct relationships with other people. They reflect the view of human nature which gives priority to social relations and the creation of a better society.

The information processing model consists of a large family of models. This group shares an orientation towards the information-processingcapacity of the student and the systems which can be taught so as to improve his information processing capacity. By information processing models they mean the ways in which people handle stimuli from the environment, organise data, identify problems, generate concepts and provide solutions to the problems, and employ verbal and non-verbal symbols.

Person-oriented family of models shares an orientation toward the individual person as the source of educational ideas. Their frames of reference spotlight personal development and they emphasise the processes by which the individual constructs and organises his reality. Frequently, they emphasise the personal psychology and emotional life of the individual.

Behaviour modification models, in turn, have been developed from attempts to create efficient systems for sequencing learning activities and shaping behaviour by manipulating reinforcement. Protagonists of reinforcement theory believe in changing the external behaviour of the student and describe them in terms of extremely visible behaviour rather than in terms of the underlying and unobservable one.

Mitra (1972) has classified the definitions of teaching broadly into three types, (i) imparting knowledge of skill, (ii) doing anything and everything that may lead to learning and (iii) social acts of influence.

Nuthall and Snook (1973) have tried to classify concepts of teaching under three models such as, (i) Behaviour control/ Behaviour-modification model, (ii) Discovery-learning model and (iii) Rationale model.

Behaviour control model is the set of concepts which claims that teaching is generated by the automated (programme) instruction movement and the consequent attempts to apply behavioural psychology in education. The label 'behaviour-control' has been applied to this model because, the notion of teaching as a method of controlling the behaviour of students and the conditions of learning incorporate many of the concepts and ideas presented by their protagonists. The alternative behaviour-modification version of the behaviour-

control model is much more concerned with overt student-
behaviour. In this version teaching is viewed primarily
as the arrangement of the classroom.

Discovery-learning model represents an attempt to
give psychological respectability to the inspired
performance of the master teacher. The advocate of
discovery-learning model tends to rest his case on the
evident excitement and inspiration of those moments in the
classroom when teacher and pupils achieve together some
significant insight into the nature of things.

While the previous models are psychological in
origin and orientation, the rational model emerges from
philosophy. The main exponents are from within the
analytic movement in philosophy. Underlying this model are
certain basic assumptions. Man is viewed as a rational
being whose behaviour cannot be completely understood
in the terms associated with animal life or machines.
Rationality implies a moral thesis asto how man is to be
treated. It may be seen that the types (i) and (ii) of
Mitra's classifications of definitions i.e., imparting
knowledge or skill and doing anything and everything that
may lead to learning, conform to information processing
models of Joyce and Weil (1972) while the type (iii) conform
to i.e., a social act of influence to the social interaction
models.

Now, the definitions need be analysed further according to their conceptual associations as discussed hereunder.

A : Teaching as Imparting Knowledge or Skill :

Little Oxford Dictionary : Teach : impart knowledge of skill, give instruction or lesson, instil inspire with. Morrison (1934) : Intimate contact between a more mature personality and a less mature one which is designated to further the education of the latter. Ryans (1965) : Teacher behaviour to be genotypically defined in terms of a set of hypothetical constructs, are assumed to characterise the teacher system, and are postulated to interact and mediate the observable teaching response in a particular situation. The functioning of the teacher is described as teacher information processing, information forwarding and information control.

B : Doing anything and everything that may lead to Learning :

Hough and Duncan (1970) observes : that teaching is a unique, professional, rational and humane activity in which one creatively and imaginatively uses himself and his knowledge to promote the learning and welfare of others.

C : Process of Interaction :

AERA (Gage, 1962) maintains that teaching is a form of interpersonal influence aimed at changing the behaviour

potential of another person. Gage (1963) further professes
that teaching is an interpersonal influence aimed at
changing the ways in which other persons can or will behave.
The restriction to 'interpersonal' influence is intended
to rule out physical (e.g., mechanical), physiological, or
economic ways of influencing another's behaviours, such as,
pushing, dragging him, or depriving him of a job. Rather
the influence has to impfinge on the other person through
his perceptual and cognitive processes i.e., through his
ways of getting meaning out of objects and events that his
senses make him aware of. According to Hughes (1963) however,
teaching is interacting. Here interaction means the
partners or objects in a situation acting upon each other.
Hence, teaching cannot be considered without a learner.

To Amidon and Hunter (1967) teaching means an inter-
active process, primarily, involving classroom talk, which
takes place between teacher and pupils and occurs during
certain definable activities. Flanders (1970) considers that
the act of teaching lead to reciprocal contacts between the
teacher and the pupils and the interchange itself is called
teaching. Buch (1972) suggests that teaching is a process,
preactive and interactive, aiming at bringing about changes
(in pupils). According to Mitra (1972) teaching is a series
of acts carried out by a teacher and guided by the formulation
of teaching in a formalised instructional situation. He has

further elaborated that teaching (a) should be restricted
to the formalised instructional situation, (b) there must
be at least two persons for teaching to take place and
these two persons are bound by contractual relationship which
is an aspect of the formalised instructional situation, and
(c) teaching consists of a series of acts aimed at specific
learning on the part of the pupil. Bidwell (1973) proclaims
that teaching is a series of interactions between someone
in the role of a teacher and some other in the role of a
learner, with the explicit goal of changing one or more of
the learner's cognitive states (what he knows or believes
or his skill in performing cognitive tasks) or motives.
In its aim of teaching it is coterminous with socialization.
It is distinctive in the social definition of the interpersonal
relationships that it involves.

D. Teaching as the Act of Creation of Psychological Force :

Thorndike (1913) pioneered the concept that teaching is
the arrangement of situations which lead to desirable bonds
and make them satisfying. To Brubacher (1939), teaching is
an arrangement and manipulation of situations in which there
are gaps or obstructions which an individual seeks to overcome
and from which he will learn in the course of doing so.
Gagne (1965) attests that teaching is arranging the conditions
of learning that are external to the learner. These conditions

need be constructed in a 'stage-by-stage' manner, taking
due account of each state of the just previously acquired
capabilities of the learner, the requirements for retention
of these capabilities and the specific stimulus situation
needed for the next stage of learning. Skinner (1968)
explains teaching to be the arrangement of contingencies
of reinforcement undef which students learn. They learn
without teaching in their natural environments, but teachers
arrange special contingencies which expedite learning
hastening the appearance of behavior which would otherwise
be acquired slowly, or making sure of the appearance of
behaviour which might otherwise never occur.

E. Concepts Philosophical in Origin and Rational in Interpreta-
   tion :

Smith (1961) being one of the proponents of this group
observes that teaching is a system of actions intended to
induce learning and further, with Meux elaborates that
teaching in its essential feature is a system of social
actions involving an agent, and end-in-view, a situation
with two sets of factors; one set over which the agent has
no control (e.g. size of classroom and physical characteristics
of pupils) and the other set which the agent can modify with
respect to the end-in-view (e.g., assignments and ways of
asking questions). The latter set of factors constitute
the means by which end-in-view are attained (Smith and Meux,
1970).

Later, further, Smith (1971a) elucidates that teaching

consists of a succession of acts by an individual whose

purpose is either to show other persons how to do something

or inform them that something is the case. The word 'teaching'

thus defined is used to refer to what the teacher does

rather than to the behaviour of the student or to what

happens to him as a result of instruction. Learning is not

stipulated as a characteristic of teaching. To Scheffler

(1971) however, to teach in the standard sense, is, at some

points at least, to submit oneself to the understanding and

independent judgment of the pupil, to his demand for reasons,

to his sense of what constitute an adequate explanation.

Green (1971) summarises that teaching, in short, is not

simply norm-conforming; it is norm-obeying. Turner (1964)

has viewed teachers as professionals specialising in the

performance of a particular body of tasks or problems. These

problems are thought of as involving the union of two broad

variables, (i) instructional goals (behavioural expectancies)

held desirable by some persons or group and (ii) pupils at

particular levels of development. This broad perspective of

teaching implies teachers to be engaged in two central

activities, (i) goal setting and (ii) instrumental responding,

to actualise these goals. The former is identified as problem

creating activities and the latter as problem solving

activities. Kaufman (1966) considers that teaching is designed

to bring about changes in the capabilities of pupils to
perform human actions for themselves. In this view teaching
is regarded as predominantly linguistic affairs. Thinking
and language are viewed as closely linked and since the
rational model is concerned with thinking, it is also
concerned with language.

Among the models, however, behaviour modification
model might well have been given alternative title of the
'learning theory model', because protagonists of this model
tend to see the practice of teaching as an exercise in the
application of well established learning principles to the
attainment of goals. There have been a considerable number
of researches which have contributed largely to the
elaboration of the model and have assisted in publicising
the model to the educational world.

Conclusion regarding the Nature of Teaching and Working Definition

Different groups of definitions may thus, lead one
to understand objectively the classroom phenomena i.e., the
teaching-learning process. Now, if teaching means
facilitation of learning, all the conditions of learning,
regarding which there is a common consensus among all
schools of learning, should be considered integrally to
evolve the process of teaching i.e., purposiveness, goal

seeking, modification of behaviour, intention, motivation,
individual as social nature of learning, structure,
organization among learning materials, meaningfulness and
etc. To include all these criteria, teaching should
comprise a preactive process, an interactive process to
substantiate the social contractual factor and a goal
setting and goal-seeking process for all remaining factors.
In this way the working definition for the present study
may be formulated as 'teaching is a process, preactive,
interactive, contractual by nature, aiming at bringing
specific learning or changes among the pupils in a formalised
instructional situation.'

1.2.0 Teaching Behaviour

A major setback in the development of a mode of
propositions or statements representing an instructional
theory is that the technical language needed for such a
task has not yet been evolved. Much more will have to be
said about this language problem in connection with the
discussion of the independent variables of theories of
instruction. Teaching behaviour is one of such terms
which will be used for the present study to be considered
as an accepted term or concept. But the problem is that in
the research literature, teaching, teacher-behaviour and

teaching behaviours have been used interchangeably, meaning thereby the same concept. After analysing however, the various concepts of teaching it is evident now that 'teaching behaviour' is somewhat different from 'teacher behaviour'.

In a real classroom situation, two sets of behaviours, one set emitted by students and the other emitted by the teachers are observed. The behaviours shown by teachers are asking questions, listening, showing something, reprimanding, observing and other nonverbal expressive ones. These linguistic activities have been recognised by Smith and Meux (1970) as teacher behaviour.

Identifications of these operations appeared first in Smith's 'The Logic of Teaching' (1961b), and then in Bellack and Davitz's 'The Language of Classroom' (1963,1966) and subsequently in the Aschner-Gallagher's Category System. Turning to the instruction taking part of the teaching cycle, parallel type of behaviours as defining, explaining, valuating, are again, observed among pupils. Directive verbal behaviour of pupils occurs infrequently. The same observation holds for admonitory behaviour. Classroom conventions do not permit the pupil to praise, blame or advise the teacher with respect to his work. But this happens in occasion when he engages himself in performative actions to set up laboratory equipment or build up a map and etc. The expressive behaviour of the pupil is therefore, the same as that of teacher.

Flanders (1970) has defined teaching behaviour as acts by the teacher which occur in the context of classroom interaction. This definition deviates from the basic definition of teaching given by himself (1970) where teaching is considered as the interchange between the teacher and the pupils. The teaching behaviour should have then included also the pupil behaviours which occur in the context of classroom interaction. Padma's study (1975) has overcome this gap in her concept of teaching behaviour.

According to the working definition of teaching under the present study, teaching behaviours imply all the activities shown by the teacher and the pupils, of course with the exclusion of those activities as different types of mannerisms or idiosyncracies as pointed out by Mitra (1972), which in no way lead to learning outcomes. In other words, teaching behaviours may be specified as the total set of behaviours emitted both by the teacher and the pupils in the formalised, institutionalised situation/to learning.
                                                                        leading

1.3.0 Certain Concepts in Teaching Behaviour and Approach
        to the Strategy of Teaching

Though an attempt has been made to give an idea about teaching and teaching behaviours still much remains unresolved as many of the concepts of teaching behaviours have no universally accepted connotations. Some of them

are very significant since they need operational definitions
for any experimental research as in the case of the present
study. Though there are varieties of teaching behaviours
manifested in the classroom situations, conceptualisation
of certain orders, it is expected, would help to identify
certain strategies leading to a particular type of learning
outcomes. Therefore for the selection of strategy of teaching
certain related concepts need clarification now. The concepts
with their identifiers may be listed for convenience, as
follows :

1. Episode-Monologue-logical operation (Smith, 1963),

2. Interaction pattern (Morine, Spaulding and Greenberg, 1971)

3. Pattern, Critical behaviour (Flanders, 1970),

4. Strategy (Smith, 1963; Taba, 1969; Hough and Duncan, 1970),

5. Strategy-Venture-move (Smith and Meux, 1964),

6. Strategy and Tactics (Strasser, 1967),

7. Teaching style (Anderson, 1943, Anderson and Brewer, 1945;
   Gogan, 1958; Lippit and White, 1943; McNeil and Gordon,
   1959; Ryans, 1960; Wrightstone, 1951; Beller, 1970;
   Gallangher, 1970; Turner, 1971; Davis, 1972.

Many concepts of classroom teaching have thus been
identified so far. But the investigator is prone to emphasise
principally on three concepts namely, pattern, style and
strategy. Because, they have been more extensively used,
though in most cases, dismally intefchangeably. An utter
confusion haunts the researchers when they seek for an operation

definition. It is imperative therefore, to make a modest attempt to clarify these concepts in particular in the intrinsic need of the investigation itself.

Concept of Patterns

Patterns of teacher behaviour have been universalised mainly due to Flanders (1970). According to him an event is the shortest possible act that a trained observer can identify and record. Often, during classroom interaction, same sequence of events occurs again and again and such a sequence is called a pattern. A pattern is thus defined as a short chain of events that can be identified. It occurs frequently enough entailing interest. It can also be a label (or name) since this often facilitates thinking. This idea of pattern has been accepted by Sharma (1972) in her study. Sharma used "patterns of teacher's' classroom behaviour" in place of 'patterns of 'teaching' behaviour' as she included both 'teacher behaviours' and 'pupil behaviours' in her study. The idea of Flanders (1970), where he excluded pupil behaviours from teaching behaviours, was adopted by Sharma. Padma (1975), as noted earlier, covered the gap as her concept of teaching behaviour included the total activities of the teacher and the pupils as in the present study. Roy (1976) also considered the total sets of behaviours emitted by the teacher and the pupils in the teaching-learning situation.

Morine, Spaulding and Greenberg (1971) also give the
idea of 'interaction pattern' which is a unit of exchange
between the teacher and the pupil, beginning always with a
question by the teacher followed generally by a student's
answer and ending with the teacher's reaction to the
student's answer. In the study of Morine, Spaulding and
Greenberg (1971) different kinds of 'interaction patterns'
could be distinguished from one another by the difference
in the ending of the pattern, i.e., by the teacher's reaction
to the student's answer.

Patterns of Teaching Behaviour (Smith and Meux, 1964)

The basic forms of the unit of discourse are the episode
and the monologue.

An episode is defined as one or more exchanges that
comprise a completed verbal transaction between two or more
speakers. Certain regular sequences of verbal interplay fall
into endlessly repeated patterns of action and responding
action. Two basic patterns of verbal exchange have been
encountered in classroom discourse. These are 'reciprocating
pattern' and 'coordinate pattern'. Episodes are made up of
three parts - an opening phase, a continuing phase and a
closing phase.

A monologue is defined as the 'solo-performance' by a
speaker addressing a group. Monologue discourse does not reveal

any great regularity of pattern or phaselike qualities as does episode interplay.

Types of monologue activity characteristic of classroom discourse are didactic or expository discourse (the most common, announcements, and assignments by the teacher - and the presentation of assigned reports, recitations of memorised material, and so on, by the student.

Style in Teaching

This is another concept in teaching which has been used and interpreted in different ways by different persons. Whatever studies have been made so far on this concept lead one to think about 'style' associated with personality pattern of an individual teacher. The concept of different teaching styles is germane in the field of social psychology of education, to be more specific in the social climate of the classroom. A host of researches tried to identify different teaching styles according to the personality pattern of the teacher.

Anderson's (1943) 'Dominative' teacher expects conformity on the part of the children to teacher-centred goals. Dominative behaviour leads to responses which stiffles differences in others, reduce interaction and make understanding more difficult. The 'Integrative' teacher works with pupils for a common goal. Socially integrative behaviour

is characterised by flexibility and a desire to bring
about differences in order to find out a common purpose.
There is friendly cooperation between the teacher and the
pupils. Anderson observed that the individual takes on the
characteristic behaviour of the social group, which is
influenced by the behaviour patterns of his leader.

Brookover's (1940) 'Dictatorial-Unfriendly' teacher is
dominating and keeps himself apart from his students. The
'Democratic-Friendly' teacher works with the students and
is permissive in his relationships with the pupils.

Lippit-White's (1939,1943) - 'Authoritarian' teacher
dictates techniques and determines the type of activity
that goes on in the classroom. The 'Democratic' leader is
identified as involving the group in discussion and
decision making. Choice-making of group goals is a result
of group activity. The 'Laissez-Faire' leader completely
dissociates himself from group decisions and activities, but
supplies the physical necessities.

Bush's (1954) 'Guidance' teacher is integrative in
behaviour toward his students, the 'subject-matter' teacher
is concerned with mastery of knowledge and insists on high
standards of performance by his students; the 'Creative'
teacher is interested in bringing out the creative potential
of his students and will not let the curriculum interfere
with this goal. The modes of behaviour have been grouped by

Gordon into three classification as 'Instrumental',
'Instrumental-expressive' and 'Expressive'. The
'Instrumental' leadership is a task-oriented style and
seeks to establish a classroom climate wherein all
leadership functions are centred in one person.

Teacher leadership style plays an important part
in determining the social climate of the classroom.

Ryans (1960) in his study of the characteristics of
teachers has identified three general ways in which
teachers differ in their behaviour (i) warm, understanding,
friendly versus aloof, egocentric, restricted behaviour;
(ii) responsible businesslike, systematic versus evading,
unplanned, slip-shod behaviour and (iii) stimulating,
imaginative versus dull, routine behaviour. The
characteristics of teacher's classroom behaviour as
identified by Ryans (1960) highlight teacher's personality
aspects.

Teaching style as Beller (1970) refers to as belief
systems, attitudes and other personality characteristics
of teachers are often not subject to training over a short
period of time. Providing a responsive environment to
child initiated and selected activities, requires much
more complex interaction in which style variables such as
spontaneity, receptivity and others mentioned above play
an increasingly important role as a part of the teaching

process. The relative emphasis and importance of technique and style may vary from one programme to another. However, all programmes require more or less specified variations of each. Turner (1971) views teaching along three primary dimensions - structure, style and substance : the structure of teaching has two types of prepositions :
(i) logically necessary conditions which must occur and
(ii) the empirical conditions which must/met if teaching
is to evaluate learning. 'Style' as Turner defines, 'in teaching is wholly a matter of synthetic propositions', which variates according to the performance of operations of teaching and asserts that certain operations increase the probability of teaching eventuating in learning, further asserting about the structure of teaching. The statement of the variation in performance of the operations eventuating in learning outcomes is to be regarded as the teaching style to be classified as 'task relevant style' and leadership style, for purposes of research. Substance, one of the variates in teaching is what one operates with or on, and which may be hypothesized to interact with style and perhaps the synthetic aspects of structure.

Beard (1976) in an exploratory study of dimensions and effects of teaching style made a descriptive framework and identified six dimensions of teaching styles as didactic, generalist, and researcher approaches to subject matter, student responses, ambiguity and warmth. Techniques of

teaching have been pointed out by Beller (1970), as
strategies and methods employed by a teacher to accomplish
her objectives. Instead of clarifying the term 'technique',
she has equated it with strategies and methods, thus
leading to some misconceptions about technique. She has
distinguished technique from her concept of style by
referring techniques more often associated with the
implementation of skill and programmed instruction.

Concept of Strategy :

Taba (1963,64,65), Smith and Meux (1967) all deeply
concerned with effectiveness of teaching, developed this
concept of teaching behaviour while Hough and Duncan (1970),
and Gerhard (1971) and Strasser came later on in this domain.
Some of them have treated strategy and tactic together. If
those concepts are discussed together, they may lead to
better understanding of their ideas. Regarding strategy
and tactic they hold the opinion that evidently there is
either no best method of teaching or no best method that
will suit all occasions. Different objectives, different
subject matter and different pupils require different
strategies and tactics.

A strategy includes the selection of suitable subject
matter and the general organization of subject matter for
instruction as well as the modes of instruction. Tactics,

are more likely to be spontaneous than preplanned but
must be, ofcourse, harmonious with the strategy. They
are often called operations. These are the procedures
used to achieve the goals of strategy. The concept of
strategy has been very clearly presented by Smith and
Meux (1967). The maneuvers to be done with the control of
the subject matter of instruction have been stated as
strategies that are concerned with attaining certain
outcomes and hence directly related to objectives.

This concept of strategy is to be found in game
theory similar to that of Bellack's (1966) as well as in
military science. Strategy situations seem to be of two
kinds as identified in terms of conflicts and goals. In
one sort of situation, interests of the contending parties
are in conflict and the goals are different. In other
situations interests are in conflict but there are mutual
advantages in the realisation of certain goals. Pedagogically,
strategy refer to a set of verbal actions that serves to
attain certain results and to guard against others. From
a general standpoint, strategies may serve to induce
students to engage in verbal exchange to ensure that
certain points in the discourse will be made clear, and
to reduce the number of irrelevant or wrong response with
objectives of explication of concepts, elaboration of
casual conditions and the presentation of information, will
be successfully carried out. They specify two dimensions of

strategy, one of these concerns with the type and
sequence of operations and the other concerns with the
control of the participation of students in performing
these operations on the content, which may be called
treatment and control dimensions of strategy. The
control dimension of strategy again is designed to
engage the students in an exchange of ideas rather than
to teach substantive learnings. The teacher is more
concernéd to evoke the behaviour of students than to deal
with the content of instruction. The treatment dimension
on the otherhand; is primarily concerned with the
exploration, and analysis of concepts, of casual conditions
and the like. Here the teacher is involved more with the
content of instruction than the behaviour of students. The
treatment he employs will be influenced more by the
requirements of the subject. His verbal activities will be
designed to bring out relationship among concepts and
principles and to explore concepts and principles in such
a way as to make their meaning explicit.

In her 'Teaching Strategy' Taba (1963, 64, 65)
analysed thinking from a psychological and logical point
of view and came to the conclusion that while the
processes of thought are psychological and subject to
psychological analysis, the product of the thought must be
assessed by logical criteria and be evaluated by the rules

of logic. She postulated that thinking can be taught;
thinking is an active transaction between the individual
and data ; thirdly Taba concluded that specific teaching
strategies need be designed for specific thinking, and
applied sequentially because thinking skills arise
sequentially.

Taba identified a set of three cognitive tasks or
thinking tasks, and then developed sets of teaching mores,
called teaching strategies which would induce these tasks
thereby making up the process of inductive thinking. Each
task represents a stage in the inductive process, three
main cognitive stages being concept formation, interpreting
and application of principles.

Hough and Duncan (1970) mention strategies as
composed of a series of moves whereas/is defined as a move
single event that starts with the initiation of a behaviour
and ends with its transition to another behaviour.
Strategies are often used in conjunction with tactics
which are defined as a pattern of appraisal behaviour
used to support the primary instructional pattern i.e.,
strategy. The thinking about the classroom situation, the
teacher asking a question followed by a move to student
response, and the student response followed by a move to
another question, form a strategy. This strategy is supported
by appraisal behaviours (tactics) such as confirmation or

corrective feedback. They have mentioned tactics and
strategy as supporting behaviours.

Gerhard (1971) does not define strategy very
precisely, but holds the opinion that traditionally
teaching strategies have been classified as a series of
methods ranging from lecture, discussion and recitation
to the manipulated, the project, the self-discovery and
the self-selection approach. Provided with these methods,
how do we use them to promote process and how do they
fit within the behavioural approach ? Gerhard approached
the idea in a very general way.

According to Strasser strategy is a generalised
plan for a lesson(s) which includes structure, desired
learner behaviour in terms of the goals of instruction and
an outline of planned tactics necessary to implement the
strategy. The lesson strategy is part of a larger development
scheme - the curriculum.

Incidentally a tactic, in his opinion, may range from
a covert teacher behaviour to a complex of verbal or
purposeful non-verbal teacher behaviour interlaced with
student behaviours. Strasser identifies two types of
tactics as 'planned' and 'responsive'.

Strasser's concept of planned and responsive tactics
corroborates with the preactive and interactive processes of

teaching concepts as given by Buch (1972). Strasser has
been more metticulous in giving the concept of tactic
which is fundamental to the concept of strategy.

Strategies are in a sense, the 'why' of specific
teacher behaviour. Some are the functions of more explicit
'now' goals or one-lesson-accessible' strategies, others,
which take more than one lesson to develop and usually
continue over a period of several lessons, are referred
to as 'overtime' strategies. Either one-lesson-accessible
or overtime strategies may be changed, modified or
discontinued (with another substituted perhaps) as a
lesson proceeds and the teacher interprets feedback from
students. One factor which may give rise to such change
in a lesson strategy is the nature of that strategy in
relation to the hypothesized one and read readiness and
rate of progress of the unique group of students (pupils).

Strategy planning is done at a time other than at
which the teacher is teaching. However, this is not to be
denied that the teacher may get some ideas for future
strategies while still in the process of teaching.

Rationale for using the Concept of Strategy

Reconsideration of the concepts, it is contended, of
episode-monologue-logical operation, (Smith 1963);
Interaction pattern (Morine, Spaulding and Greenberg, 1971) ;
pattern, critical behaviour, (Flanders, 1970); teaching

style (Anderson, 1943. ; Anderson and Brewar, 1945,
Cogan, 1956; McNeil and Gordon, 1959; Ryans, 1960;
Turner, 1971; Wrightstone, 1951); Strategy (Smith, 1963;
Taba, 1969; Hough and Duncan, 1970); Strategy-Venture-Move,
(Smith and Meux, 1967); Strategy-Tactics (Strasser, 1967);
Cognitive Structure (Gage, 1972); and Cognitive Map (Mitra,
1972), will make it clear that some of the concepts are
inadequate for this study.

If the operational definition of teaching is taken
into consideration, then the reappraisal of these concepts
would probably justify as to why the conceptual framework
or strategy has been used for the present study.

The Smith and Meux pattern (1964) gives only the
picture of verbal behaviour of the linguistic operation
in the classroom. Interaction pattern of Flanders (1970)
gives the quantitative picture of certain verbal behaviours.
It does not tell anything about the nature of content on
which it is built up, nor even about the learning outcomes
for which the whole teaching process is cafried on. It does
not even signify the logical sequence or structuring of the
process, rather it is concerned with the directedness and
indirectedness of the teacher, which again is more positively
related to attitude development. But besides affective
aspect of teaching there are some other aspects as cognitive
and psycho-motor aspects of teaching.

Regarding the concept of pattern one primary thing
cannot be ignored that for establishing some behaviour
pattern, i.e. repetition of some sequences, 'move-episode'
should come in a particular sequence. Here an analogy
drawn from a very simple experience may help one to
understand the gap in the concept of pattern. The very
word 'pattern' has been borrowed from applied art, and
handicraft. If a particular pattern, suppose,with one purl,
one knit, is repeated for the whole length of the fabric
(here question, answer, question, answer for the whole
period) it will make a fabric of particular length. If
somebody knits a jacket with the same sequence of pattern
althrough without conforming to the variations necessary
at the waist, seam and neckline, can that prove to be a
jacket wearworthy in shape and size ? Every subject in
the curriculum has some definite objectives to be achieved.
If any flat pattern is knitted on the subject without
making variation (i.e. increasing, decreasing, slipping in
knitting moves) how can the varied objectives be attained ?
If, however, it happens, it will make a fabric, not a
jacket (comparable, that a monotonous pattern may lead to
the attainment of a specific kind of objective).

The concept of style is associated with the personality
factor of the teacher and dominates over the structure and
substance of teaching. If teaching is considered only as
an art, the concept of style to some extent justifies the

the teaching behaviour in the terms given by different contributors. But teaching is more than art, it is an art based on science of pedagogy. If the previous analogy is repeated here it may be pointed out that it is the uniqueness of the teacher's personality that selects the pattern of teaching, but it does not assure anybody whether he would be able to finish the piece (here the attainment of learning outcomes) to one's satisfaction. Anybody with little experience of imparting lesson on knitting, will relate the same experience.

Strategy is more than a style and even more than a pattern. In the context of knitting a fabric and jacket the place of pattern and style has already been discussed. But one requires much ingenuity and understanding of shape, variation of pattern (science of knitting) in order to knit a jacket. To bring variation of pattern for knitting is comparable to the bringing variation in teaching patterns (Teacher's move, pupils' move). In the first case it is essential to strengthen and to bring proper shape in waistline, beckline and seam while in the second case it is required to develop the objectives of the curriculum, grade level or age level of students. If the jacket is not made to shape and size required for, the patterns and styles may be considered very beautiful on an independent piece but will not serve the purpose of a jacket. The same conclusion may be drawn about pattern and style, which will not induce

the same as strategy is supposed to develop.

If the concept of strategy is reanalysed further keeping in view the military science or game theory from which the very concept has been borrowed, the reason for using this concept for the present study will become self-evident.

The classroom involves a teacher and a number of students in situations where objectives are to be attained through the actions of the teacher, often in the face of such resistances as conflicting motivations and cognitive strains. Smith and Meux (1967) in their concept of treatment and dimensions of strategy mentions only of verbal operations. Upto this point they are justified for the conceptual framework of strategy. But in actual battlefield a Commander-in-Chief (here the teacher) besides verbal operations, requires the use of other types of arms and ammunitions (in actual teaching, besides verbal strategies, manipulation of different instructional materials) which has not been considered by Smith and Meux (1967).

Taba's (1967) concept of strategy for different levels consisting of minor steps for each level considers both the verbal operation and manipulation of instructional materials which are prerequisites of operations in the field.

Mitra's (1972) concept of 'cognitive map' is an integral part of strategy in the sense that when a competent

commander is entrusted with his responsibilities he cannot
move a single step without the field map of the opponent
party (here cognitive map of students) in order to locate
the position of the rivals, the knowledge of which helps
him to spot out both the weak and strong positions of the
other party and to select the strategy thereby. The
concept of cognitive map which is so indispensable for
actual strategy has not been mentioned by Smith and Meux
(1967). Taba (1963, 64, 65) touches the area in a general
way but the idea is implied in the formulation of steps.
It may also be stated that Gage's (1972) 'cognitive structure'
and Mitra's (1972) concept of 'cognitive map' are
prerequisites for any strategy which involves control and
treatment dimensions, verbal and material operations
arranged in a proper sequence, which the commander (teacher)
visualises to be most effective for attaining the curricular
objectives.

1.4.0 Trend of Research

The purpose of the teacher is to know what instructional
procedures are most likely to prove useful in achieving
certain instructional ends with given students. The
researcher's purposes include various aspects : it is to
satisfy a desire to describe accurately what teachers do,
to search for associations between theoretically and
empirically derived variables and learning, and to demonstrate

the power of a given factor or instructional operation
to make a practical difference upon the outcome sought
after. Various views exist asto what teacher effectiveness
is, and there are numerous applications of the construct
to the field of teaching. Nuthall and Snook (1973) very
categorically state, 'the guiding force of much of the
research on teaching has not been the discovery of
systematic accumulation on empirical knowledge and
certainly not the gradual refinement of seminal models
and large theoretical structures. Rather the greatest
amount of research and discussion has been generated by
debate and controversy over certain highly provocative
concepts and claims about how teaching ought to be viewed.'

The evaluation of researches on teaching will be again
possible if the variables studied and approaches to
methodology are kept in view. In respect of variables the
studies on teaching fall into three major categories as
(i) presage (ii) process and (iii) product variables.

The term 'presage' means 'prognostic'. Presage
variables are considered to be those variables which help
in predicting future teaching effectiveness. Commonly
studied presage variables are the age, experience, sex,
academic preparation, professional training and personality
of the teacher. Process variables are those which denote
the type of activities carried on in the classroom i.e.,

asking questions, narrating, illustrating, giving directions, showing something to students, pupils keeping silent, pupil narrating etc. These can be termed as teaching behaviours. Gage (1972) has stated about process variables as those human actions which transfer the raw materials of input into opportunities for learning. The outcomes as a result of process form the product variables in the form of different types of pupils' attitude development, achievement and abilities which may belong to any of the cognitive, affective and psycho motor domains. Researches are conducted to find out presage-process, presage-product and process-product relationships.

Three types of research as distinguished by Gage (1972) are Experimental, Correlational and Process-descriptive. In experimental studies teaching behaviour is taken as treatment variables or dependent variables. The dependent variable/criterion variable is the change in the knowledge, understanding or attitudes of students. In the second type, the independent variable is not manipulated instead it is observed, rated or tested, the dependent variables remain the same; hence the result of the study is typically somekind of a relationship measured by correlation coefficient through the manipulation of treatment/independent variables. In the third type the emphasis is on description. The purpose is not so much to ascertain relationship between

variables as to describe an aspect of the teaching process itself. Rosenshine and Furst (1973) have termed this as 'Descriptive-Correlational-Experimental' loop as a paradigm of research of teaching.

Research on teaching can be traced back to as early as 1910 (Gage, 1968a). The number of researches conducted is quantitatively quite high by 1973. The major bibliographies, reviews and summaries of research on teaching (Barr, 1948; Barr et al., 1961; Buch, 1974; Casteller, Standlee and Fattu, 1954; Domas and Tiedeman, 1950; Mitzel, 1960; Morsh and Wilder 1954; Ryans, 1960b; Tomlinson, 1955a, 1955b, Watters, 1954) have reflected the concern of teacher effectiveness with the inclusion in the titles of such terms as 'effectiveness', 'competence', 'evaluation' and 'appraisal'. The same is true about much of the research reviewed in the Handbook of Research on Teaching (Gage, 1963) and Second Handbook of Research on Teaching (Travers, 1973).

The reviewers got a picture of unrelated studies, many not showing significant results, some of them significant notwithstanding the trial of replication. After reviewing researches on teaching Morsh and Wilder (1954) concluded, 'no single specific observable teacher act has yet been found whose frequency or percent of occurrence is invariably and significantly correlated with student achievement'. Both

Howsam (1960) and Fattu (1962), after reviewing the
research on predictor criterion and teacher-effectiveness,
have expressed that none of the characteristics like age,
sex, marital status, intelligence, experience, cultural
and socio-economic background, scores on aptitude tests,
job interest, voice quality and special aptitudes has any
link with the teacher effectiveness.

Chung-Phing Shim (1965) also concluded that teacher
variables, namely college grade points average, degree,
certification and experiences make no significant difference
in pupil achievement. Barr and others (1967) in their series
of Wisconsin Studies attempted to find out the factors
contributing to teacher effectiveness. The mostly used
criteria for measuring teaching effectiveness in these
studies were, (i) efficiency ratings of one sort or the
other, and (ii) measured pupil gains. It was found that
different criteria gave different results. The members of
the Wisconsin group used different techniques and different
criteria in their study. Erickson (1954) concluded that the
generally low interactions among the several temperament,
personality and achievement measure lead one to doubt
about their effectiveness as predictors. Lamke (1951) found
that there are no clearcut personality pattern for good
and poor teachers. Schmid (1950) concluded that differences
in patterns were not the same for both the sexes. On the
contrary Barr (1961) found that good teachers as compared

with poor teachers were more vigorous, more enthusiastic
and happier, less attractive, more emotionally stable,
more pleasant, sympathetic and democratic, possessed a
better speaking voice and displayed a keener sense of
humour. Peronto (1967) also found that good and poor
teachers would be differentiated only on the ground of
knowledge of subject matter, of pupils and of professional
knowledge.

In contrast to the findings of Barr (1961) Jayne (1945)
found no relation between the teachers' speech ability
and between either immediate or delayed recall of factual
material. Quraishi's (1972) findings are also not identical
with that of Barr's (1961). Thus, the findings of different
studies inquiring into the relationship between teacher
characteristics and their effectiveness do not show any
significant and consistent relationship. If any researcher
follows either the note of optimism of Smith (1971b), or
the direction as we find in Peronto (1967) e.g. : 'it appears
that whether a specific behaviour is good or poor, teaching
depends to some extent upon objectives and upon content in
which the behaviour occurs', will no doubt find a way to
teacher effectiveness. With the ideas of the presage, process
and product variables in the foreground it can be said that
Wisconsin Studies have aimed at establishing a direct
relationship between the presage variables and product variables.

The by-passing of the process variables may be one of the main reasons for not getting any concrete and concurrent result. Of late much research has been taken up giving due importance to process variables.

Those considering the teacher effectiveness should keep process versus outcome distinction clearly in mind. Inspite of the recognition that the best criterion of teacher effectiveness is the modification of the learner, researchers, experiencing the difficulty associted with this type of study, have opted for descriptive correlative type of studies. By studying certain procedures employed by teachers and then assuming that these processes are related to pupil growth, the investigator gets a readily accessible process criterion and contends that it reflects on an outcome criterion. An illustration of a common weakness in research investigation using process criteria appears in the work of Sprinthall, Whiteley, and Mosher (1966).

Whether one is seeking laws or mere restricted relationships, one is likely to engage in process-product research. Various practices are followed for this kind of research, but the most common practice is to associate teaching behaviour with student outcome measure via a correlation study. The independent variables are usually scored from a frequency count of specific observable teacher actions or check marks on a rating scale that calls for an observe making inferences about the teacher. Measures of

independent variable are then compared with those of
dependent variable such as student's test scores on
cognitive, and affective growth. The dependent measures
are often adjusted for the learner's initial attitude,
achievement and aptitude.

Process-product studies have produced some of the
best variables on the relationship between teacher behaviour
and student achievement. Some fifty process-product studies
have been reported by Rosenshine and Furst (1971). All the
studies were conducted in classrooms with normal children;
in most studies only the class mean was employed in
analyses; and few attempts were made to determine the
relationships between teacher behaviour and student
achievement for subgroups of students differing in achievement,
aptitude or personality. These studies have focussed on
general teaching behaviour. The review covers only the
relationship between teacher behaviours and student
achievement and the whole review is based on correlational
studies.

Of all the variables which have been investigated in
process-product studies to date, five variables have strong
support from correlational studies while six are less strong.
The relationships are positive for ten of the variables and
negative for use of criticism. The strongest findings,
however (Rosenshine, 1970a, b), have not shown any significant

relationship between behavioural characteristics and achievement, though seem to be apparently satisfactory.

Gage (1969) hold Bellack and his co-workers (1966), Davidson (1968), Flanders (1965), Jackson (1966a), Lashier (1966), Smith and Meux (1964), Nelson and others (1956), Powell (1968), Soar (1967) as describers in the field of research on theory of teaching, and all of them produced detailed analyses of what goes on in the present day class. Furst and Amidon, (1967), Hughes (1962) as well as Perkins (1965) conducted descriptive studies of classroom teaching behaviour. The long range assumption of describers is that : once important correlates of teacher effectiveness in the present-day classroom are ascertained, it will be possible to train teachers to be more effective.

Descriptive studies have been used to develop normative data on teaching as it occurs in typical classrooms. Data from studies conducted in high school teaching show that the teachers spend much of their time covering the content that requires but one common pattern of student thinking, fact stating or cognitive memory. Furthermore, the research results by Bellack et al., (1966); Gallagher and Aschner (1963); Smith et al. (1962, 1964, 1967) show that there is little evidence that teachers are concerned with any logical strategy of subject matter delineation.

Experimental studies are usually based on the
hypotheses generated by other types of research. Regarding
teaching behaviours there are two types of experimental
studies, one by taking teaching behaviour as dependent
variable and another by taking the same as independent
variable. Changes in teacher-behaviour and teaching-learning
process arising out of the training in interaction analysis,
microteaching or other types of methods on teachers and
student:' teachers belong to dependent variable. On the
other hand,the different treatments or teaching behaviours,
manipulated in order to see their effect on achiement of
pupils, come under the second category. Regarding the first
type of experimental studies several steps have been
delineated by Rosenshine and Furst (1971) to determine
asto whether teachers trained for speéific performance
criteria behave differently in their classroom from those
who do not receive such training. They also hold the opinion
that it is more important to determine asto whether the
trained teachers engender better cognitive and affective
growth in their students compared to their controls.
Rogers and Davis (1970), Carline (1969), Domino (1971),
Gunnison (1968), Herman et al., (1969), and Worthen (1968)
conducted researches to put these ideas into action.

Miller (1966), Gunnison (1968), Carline (1969),
and Herman et al., (1969) attempted to be more supportive in
their classrooms; Worthen (1968) taught a mathematics unit

in specified ways, Carline (1969) used more praise and
support of student ideas, Rogers and Davis (1970) worked
on teachers asking questions on a higher cognitive level.
Domino (1971) tested the hypothesis that there is an
interaction between a students achievement orientation and
the teaching style he is exposed to. Results indicated
that there was no significant effects of teaching styles.
Herman et al., (1969) matched ten teachers on the basis of
teaching experience and direct-indirect ratio. The result
was inconsistent and inconclusive. Schutz et al. (1967)
found that indirect teaching influence produced learning
gain in recall in both higher and lower ability group.
Soar (1968) obtained curvilinear and superior growth of pupils.

Mitra (1970) has broadly classified the research trend
on teaching into two classes (i) criterion approach, and
(ii) interaction approach. Criterion approach he says, 'is
concerned with the criterion of teacher competence which are
then sought to be predicted by a set of variables involving
teacher personality and its antecedents and its 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 consequences of teaching leading to some
measurable degree of effectiveness as defined by a set of
criteria, on the other.' Regarding interaction approach he
says, 'the second approach considers teaching process more

more directly but it considers as classroom social interaction. The teacher in a class does something and the pupils do some other things. The focus is on an accurate description of the sequence of classroom events of teacher-pupil interactional behaviour. Here the emphasis is on in the classroom. The consequences of teaching which inevitably figure prominently in the criterion approach are not of general or primary concern. '

But these two approaches cannot justify the position of criterion based process-product-experimental type of research which is gaining more and more important ground in the modern researches of teaching.

Hence, many if not most of the best known studies have been aimed at social and emotional aspects asto how teachers behave and how students respond and develop. It may also be pointed out that more successful research on teaching have been non-cognitively oriented. Whatever historians might have found, the fact is that research on teaching for cognitive objectives until recently, is relatively little of descriptive, analytical, theoretical, experimental or correlational nature which can be found in abundance in other areas of objectives. Until recently no major effort had been made to produce general principles of teaching behaviour related to achievement of cognitive processes.

Some representative researches in cognitive aspects
of teaching are of Smith and Meux (1962, 1964), Bellack et al.,
(1966), Gage (1966), Taba (1964), Smith and Meux (1962, 1964),
assuming that influence of instruction is primarily logical,
they identified the units of verbal discourse which could
be sorted into different logical categories as 'defining',
'explaining', 'evaluating', and 'classifying' and larger
units as 'strategies', and underlying this the immediate
unit of discourse as 'venture'.

Their raw data reflect classroom intellectual life as
it is lived without the influence of the investigator. Bellack
and his collaborates (1966) analysed the transcription into
four categories of pedagogical moves : structuring, soliciting,
responding and reacting. They identified four types of meanings
in the content of discourse and termed them as the 'substantive',
'substantive-logical', 'instructional', and 'instructional-
logical' meanings of the content and found a variety of
teaching cycles, or groups of moves. Taba (1964) endeavoured
to identify different types of teaching strategies for concept
development, interpretation and application ability among
student at different levels.

The Centre of Advanced Study in Education, Baroda (India)
has adopted a model for research in Teacher-Effectiveness with
six types of variables as (i) Teacher variable, (ii) Contingency
factors that affect teaching-learning process, (iii) Teaching

behaviours, (iv) Teaching behaviours as dependent variables,
(v) Criteria of effectiveness variables, and (vi) Teacher-
Self-Estimate variables. Sharma (1972), Lulla (1974), Padma
(1975), Shaida (1975), Roy (1976) all carried their
experimental studies taking teaching behaviour as independent
variable. Jangira (1973), Pangotra (1972), Singh (1974),
Bhattacharya (1974) studied teacher behaviour as dependent
variable.

Sharma (1972), Padma (1975),Shaida (1975) and Roy
(1976), all studied the cognitive aspects of teaching and
criterion aspect with inconsistent and inconclusive findings.

By considering all relevant research bibliographies it
can be said that there is a great paucity of experimental
studies where researchers randomly selected an experimental
group from a population of teachers, equipped members of
the group with specific performance competencies and then
measured the extent to which these teachers both (a) performed
differently in their classrooms and (b) enhanced the cognitive
and affective growth of students. There are even fewer
experimental studies within classrooms, even though the
results should be of great importance to the individual
teacher interested in knowing the power of certain instructional
variables as applied to his particular situation.

The scarcity of experimental classroom studies in which
variations in instructional procedures have been manipulated

and effectively measured has been documented by Rosenshine
and Furst (1971) who expressed the opinion that in order to
furnish conclusions which can be applied to teacher education
programmes, experimental studies should have (i) teacher
as the statistical unit of analysis, (ii) random assignment
of teachers or classes to treatment, (iii) observational
data on the fidelity of teacher behaviour to the treatment,
and (iv) student performance assessed by a variety of end-of-
course tests.

In their extensive search for literature, Rosenshine
and Furst (1971) found no more than ten studies which satisfied
all four criteria. Again they have recognised on the basis
of 50 studies, several categories of independent variables
which should draw the attention of researchers. They are
(a) clarity of presentation, (b) variability including various
levels of discourse, (c) enthusiasm, (d) task orientation,
(e) student opportunity to learn, (f) teacher use of student
ideas, (g) criticism, (h) teacher's use of structuring
comments, (i) types of questions, and (j) perceived difficulty
of the course.

1.5.0 Problem Restated

As already stated in caption 1.0.0 the present study has
attempted to find out the effects of three teaching
strategies on development and retention of knowledge,
comprehension application and total achievement of pupils and

and thus, to find out a teaching strategy which is more effective in realising the expected pupil outcome. The problem reads as, 'An Inquiry into Strategies of Classroom Teaching'. The teaching content selected for the study comprises three units in Geography. The study is experimental in nature. The independent or treatment variables are three teaching strategies, namely, Strategy I (Lecturing and Questioning - Answering), Strategy II (Lecturing and Questioning-Answering by using Behavioural Objectives), Strategy III (Discussion by using Instructional Materials). The dependent variable is the pupils' attainment in knowledge, comprehension, application and total achievement under the conditions of (i) planned testing, and (ii) Retention. The ongoing discussions provide the details about the terms used in the problem.

1.6.0 Treatments

As this is an experimental study, the investigator has taken three teaching strategies as three treatments. The term teaching strategy has been explained in caption 1.3.0. The three teaching strategies designed for this study are (i) Lecturing and Questioning-Answering (Strategy one), (ii) Lecturing and Questioning-Answering by using Behavioural Objectives (Strategy two), and (iii) Discussion by using Instructional Materials (Strategy three). The following

discussions provide details about the variables involved in the different designed strategies and also the rationale behind their formulation.

1.6.1 Lecturing

One envisions lecturing as teacher talking to a group of students, who are presumably listening. The pupil participation is reduced to a considerable extent if teacher undertakes lectures (teacher being direct), instead of asking questions (teacher being indirect).

The major research question is not asto whether lecture method is effective; rather the question should be necessarily be, for what objectives is the lecture method, it is used in what ways or whether it is more or less effective than the other methods. Research on lecture method has typically compared lecture with other methods, usually the discussion method or lectures of one kind with those of the other. Now, most studies reported by Mckeachie (1967) find no difference between lecture and discussion methods. They are by Asch 1951; Bane, 1931 ; Bills, 1952 ; Carlson, 1953; Casey and Weaver, 1956; Deignan, 1956; Eglash, 1954; Gerberich and Warner, 1936; Haigh and Schmidt, 1956; Husband, 1951; Johnson and Smith, 1953; Lifson, Rempel and Johnson, 1956; Maloney, 1956; Slomowitz, 1955; Wispé, 1951, and Zeleny, 1940). But a few studies do report differences usually in favour of the

lecture such as, those of Burke, 1956; Guetzkow, Kelly and McKeachie, 1954; Remmers, 1933; Ruja, 1954; Spence, 1928) but not always so (Faw, 1949).

The more important question of retention of materials has been seldom investigated. Bane (1931), Rickard (1946) found significant result regarding this aspect while Eglash (1954) obtained no difference between those two methods.

In summarising all the findings regarding research on lecture method McKeachie observes in a tone of enquiry as to what can we say about lecture versus discussion, since discussion offers the opportunity for a good deal of student activity and feedback, it could be (according to theory) and is (according to research results) more effective than typical lectures in developing concepts and problem solving skills. However, because the rate of transmission of information is slow in discussion classes, we would expect the lecture classes to be superior in attaining the objective of knowledge. Research results tend to support this generalisation and probably are not more convincing largely because the knowledge tested on course examinations can be learned by reading the textbook.

In consideration of research results various reasons may be attributed to both effectiveness and ineffectiveness of lecturing method.

Why Variation in Lecturing ?

Although there are many different meanings of 'attention' teachers are more concerned with the student's ability to concentrate. The problems for the teachers are, firstly, asto what factors affect student concentration, and secondly, how can one use one's knowledge of these factors to help them. There are two broad factors : arousal and motivation. Both of these refer to the amount of energy a student has. 'arousal' refers to a general level of activity, 'motivation' is energy directed towards a specific kind of activity or goal. Teacher must aim at keeping students at the level of arousal appropriate to the task and this usually means finding ways to increase or maintain it.

Berlyne(1960) found that students' learning and interest were improved if students were asked questions rather than told facts. The most successful questions were those that were least expected; particularly if the subject was already familiar. There is considerable psychological evidence that the desire for interaction with other people is a very strong motive, and this may be particularly true with young people. Yet the lecture method notoriously neglects it, and attention aspect would probably be improved if another method is used to satisfy it during a lecture period.

Deutsch (1949) showed that students were more attentive, displayed better comprehension, produced more work and were more favourable to the teaching method when they worked co-operatively in groups than when they competed as individuals. Patton (1955) found that students were better motivated when asked to share decisions on the running of a course and when teaching methods required greater participation. Those who were more active were also prepared to accept more responsibility.

There is little objective evidence however, of motivating students even though motivation is generally recognised as important. It is clear that, the teacher is to build on motive that the students already pose but in some cases these are inappropriate to the lecture method. Therefore, alternative methods may sometimes be needed. Consequently, the techniques for the development of student motivation require a conscientous planning at the time when teaching is prepared.

Apart from the specific inadequacies of lectures which may be compensated by combination with other methods, there is a general educational argument for the use of varied teaching methods within a period of teaching. Briefly summarised the arguments are : (i) different kinds of objectives are best achieved by different methods (ii) teachers usually have different kinds of objectives in any particular lesson, (iii) therefore, objectives of one particulaf lesson are usually best achieved by combining several methods which form

a particular strategy for a particular lesson.

1.6.2 Questioning - Answering

This variable involved in the strategy of teching is considered to play a vital role in teaching behaviour. Teachers asking questions and pupils responding lead to pupil participation in the teaching-learning process. It develops a democratic or responsive environment in the classroom. Many studies involving these teaching behaviours have been conducted keeping in view the different objectives.

One of the aspects of teacher necessitating to be 'indirect' in the classroom is to ask pupils more questions, thereby, making them to participate more in the class-room processes. Amidon and Flanders (1965) found that pupil learning in geometry increased if the teacher were indirect. Beller, Weber and Amidon (1966) found pupils of indirect teachers gained more in achievement measures than the pupils of direct teachers. Lulla (1973), Turner (1967), also obtained similar results.

Apart from dealing the teacher asking questions as a component of the variable studied, there are studies which have dealt with questioning itself as a variable. Those who studied questioning as a separate variable are Rosenshine (1969), Conners and Eisenberg (1966), Harris and Serwer (1966), Wallen (1966), Harris et al. (1968). Thompson and Bowers (1968), Hunkins (1967, 1968), Sharma (1972), Beseda (1973), Johns (1968), Padma (1975), Shaida (1975), and Roy (1976) have studied

Questioning-answering, for developing different types of
objectives. Results are inconsistent regarding the
attainment of objectives at different levels.

Considering the implications of the studies already
undertaken, for the present investigation, 'Questioning-
Answering' is supposed to be used to advantage to supplement
the method of lecturing.

1.6.3. Behavioural Objective

Frequently the words goal and objective are used
interchangeably and a goal is a statement that proposes
desired and valued competencies, states of being and/or
general levels of proficiency to be achieved. Goals are
achieved through the accomplishment of objectives within
an educational entity (Plowman, 1971).

An objective on the otherhand, is defined as quantifiable
and/or observable achievement under speEifiable conditions.
Objectives should reflect the critical factors required for
the accomplishment of a goal. (Plowman 1971).

Instructional objectives can be stated in many different
ways, but the more appropriate way to state instructional
objectives is in terms of the types of outcomes the teacher
expects from his teaching. Thus, the focus shifts from the
teacher to the student and from the learning process to the
learning outcomes.

An objective is again an intent communicated by a statement describing a proposed change in a learner - a statement of what the learner is to be like when he has successfully completed a learning experience. It is thus, a description of pattern of behaviour (performance) one wants the learner to be able to demonstrate.

One of the recent developments in education is the insistence upon performance criteria. The trend toward performance criteria seems to be an extension of the movement for behaviourally stated objectives of 1960's, although the concept involved has had a much longer history. The idea of defining learning outcomes in terms of visible behaviour originated at the turn of the last century as part of the 'scientific movement' in education. The term 'behavioural objectives' was first used by the behavioural psychologists. During the first thirty years of the century, people such as John Watson and Franklin Bobbit advocated the stating of educational objectives in terms of learner performance. Objectives are rerequisites for both preactive and interactive decisions to be made by the teacher. Precise objectives stated in terms of measurable learner behaviour render it infinitely easier for the teacher to undertake curricular decisions. The curriculum actually consists of the collection of objectives which the teacher is attempting to achieve. Such curricular

decisions are better made on the basis of unambiguous
statements of objectives.

Gronlund (1970), Mager (1962), Plowman (1971), Popham,
(1970), have produced different specificiti es for writing
behavioural objectives.

But the possibility of promoting the attainment of
differential objectives, however, seems feasible only in
a framework where the teacher has a clear understanding of
the objectives and procedures for measuring them. In the
Review of Educational Research, John Goodlad (1960) wrote,
'there appear to be no studies establishing an actual
relationship between increased classification of educational
objectives and improved discrimination in the selection of
classroom learning opportunities for students', with respect
to quantitative empirical research. In school settings the
situation appears not to have changed much since this had
been commented. With an instructional objective the
teacher as well as the children, if they are told what the
objective is, are likely to focus on the attainment of a
specific way of behaviour. The teacher in the instructional
context knows what do look for as an indicator on achievement
since the objective unambiguously defines the behaviour.

The effective curriculum, when it is aimed at
instructional objectives, will develop forms of behaviour
whose characteristics are known beforehand. With the use of

of instructional objectives, clarity of terminal behaviour is crucial since it serves as a standard against which to appraise the effectiveness of the curriculum. In an effective curriculum using instructional objectives, the terminal behaviour of the student and the objectives are isomorphic.

The point is that, the mere statement of instructional objectives for a course or unit of instruction is of very little use in itself. The stated objective must serve as the referent for planning instruction which leads to their attainment and for evaluating the success of the instruction of individual learners.

From the published studies of educational objectives one can conclude that, (1) a very limited amount of empirical data is available on the subject,(2) a narrow range of questions have been asked, (3) most of discussions on the usefulness of educational objectives have been primarily based upon rational analysis.

One of the most helpful guides in identifying and defining instructional objectives is the taxonomy of educational objectives (Bloom,1956), Krathwohl, 1964).

Here in this study the taxonomy of educational objectives (Bloom,1956) has been aimed at selective instructional objectives in cognitive domain. Instructional objectives have eventually been translated into behavioural

objectives keeping in view the objective criteria set by
Mager (1962), and Gronlund (1970).

As behavioural objectives are 'pedagogical tools',
if properly prepared and used, it is expected to help one
to be more precise, logical and effective in planning,
instructing and evaluating learning outcomes.

1.6.4 Instructional Materials

Instructional materials may be regarded as frozen
segments of instruction that can be tested and modified
until their effectiveness reaches a maximum. Given the
time and resources one may produce instructional materials
of extra-ordinary effectiveness. Improvement of learning
from a course utilising instructional material is complicated
by the various sources of learning that are measured by
unit and course tests. The textbook is often a primary
source of learning and thus learning occurs outside the
class room. Class room instruction utilising instructional
materials often contributes to learning outcomes that are
not covered by textbooks. Several preliminary studies have
indicated that a major portion of measured learning
does not result in classroom activities only. Wakely, Marr
and others (1960) demonstrated that the lecture did
contribute significantly to learning psychology at the
college level. However, it was apparent that students were

also learning a large part from the textbook alone. Smith and McKshan (1964) found that almost 85 percent, of course, of learning may result from sources other than teacher and indicated that this fact has important implications for instructional material research. According to available researches, the effectiveness of a particular instructional material is more dependent upon the nature and quality of the message than the characteristics of the channel of communication. In a widely cited study by Swanson (1954), several different devices were used as visual aids supplementing lectures, to familiarise. A conspicuous gain from the use of visual aids alongwith a recorded lecture was also shown by an experiment by Aukes and Simon (1957). Some other inconsistent findings regarding the use of instructional materials are there. Positive results on differential case of reading graphs of differing styles were reported by Peterson and Schramm (1954). But the researcher has, however, to focus his attention on the question of what kind of visual instructional material would be helpful in achieving specially defined instructional outcomes.

In the light of previous researches and on the basis of learning experience as well as the need of the discipline, Investigator has selected 'Instructional Material' (Self-prepared maps, charts, textbook and guideline to study the maps and textbooks within the class) as one of the variables of the experiment.

1.6.5 Discussion

'Discussion' may be defined as that whereby a teacher engages himself with two or more learners in a cooperative examination and comparison of views in order to illuminate an issue and contribute to the learners' understanding. It is characterised by much more teacher-student and student-student interaction than that in the lecture method; but the range in such interaction varies from those instances in which teacher does most of the talking, to others when he is almost silent. The variable of teacher domination is reflected also in the degree to which the teacher provides the agenda, procedure, method of attack and evaluations of contributions or delegates these functions to the students. The continuum from teacher-led to learner-led embraces this variable in different terms as authoritarian-permissive, directive-nondirective, autocratic-democratic, teacher controlled-pupil planned and dominative-integrative.

The most frequently studied relationships, by far, have been those relevant to the continuum from teacher-centred to student-centred teaching. Summaries of the results of a number of studies of this variable have been reported by Anderson (1959), Stern (1963), and McKeachie (1963, 1967). In general, in the student-centred classes, students participate more and have greater responsibility for the determination of the purposes, content, procedure and

course of discussion. Generally, no consistent differences
occur in knowledge outcomes, but the student-centred class
yields greater gains in higher cognitive processes and in
affective outcomes. Thus, McKeachie (1967) summarises
the following results. 'In eleven studies, significant
differences in ability to apply concepts, in attitudes, in
motivation and in group membership skills have been found
between discussion techniques emphasizing freer student
participation compared with greater instructor dominance.
In ten of those, the differences favoured the student-
centred method. The eleventh has missed results.'

Underlying this broad generalisation, based on studies
varying widely in terms of subject matter or details of
procedure, are some basic phenomena, related to the
acquisition of knowledge, higher-level of cognitive processes
and attitudes. The superiority of student-centred discussions
in promoting higher level cognitive skills, such as, the
ability to think critically or make applications, probably
is germane in the greater opportunity to practise such
skills in student-centred discussions; It is the situation
where students have more freedom to try alternatives,
covertly and overtly and receive feedback from the group.
Bloom (1956) found that students' thought were more often
relevant to the subject matter in discussion than in lecture
sessions.

But many criticisms (Anderson, 1959) have been made of
the research and reasoning on which those conclusions are

based. First, the independent variable, student-versus
teacher-centred discussions, is inadequately defined and
the role of the teacher should be very clearly defined.
Sometimes, all adverse qualities of a teacher are assigned
to directive teaching which should be avoided. These two
types of teaching should be differentiated as to their
effectiveness for different kinds of subject matter.
Teacher-centred discussion may be more fruitful in some
teaching fields where there is substantial agreement on
major concepts, principles and methods. The student-centred
discussions may well be found to be superior for the
objectives of low consensus areas, whereas the teacher-
centred approach may be better for the objectives of high
consensus fields.

Thirdly, what is even more significant is that research
on teaching by discussion method needs to look at the details
of what goes on in teaching sessions otherwise, it is
similar to compare the results of two drugs of unknown but
varying composition that are being used for different purposes

By studying the implications of previous discussion,
and keeping in view the working definition of teaching, the
investigator planned to formulate all the steps of discussion
as well as to take the role of a leader in the class, whose
main objective was to attain the different levels of
cognitive objectives specially comprehension and application

by increasing the amount of pupil participation. It was
also the purpose of the investigator to utilise the
scheduled period to the maximum, which might not have been
possible in case of student-centred discussion. The
apprehension was not unjustified as all the studies in
discussion method so far referred ㅅ were conducted in
higher levels of teaching.

1.7.0 Criterion Variables

Attempt has been made in the earlier discussions to
establish that the present study is a process-product one.
The product happens to be the pupils' outcomes in the
cognitive domain. The objectives at the cognitive domain
have been classified by Bloom and his associates (1956) in
the hiararchical order as knowledge, comprehension, application,
analysis, synthesis and evaluation, knowledge being at the
bottom of the hierarchy. Knowledge, Bloom and his associates
(1956) define as the recall of the specifics and universals,
of methods and processes, and of a pattern, structure or
setting. The knowledge objectives emphasise most of the
psychological processes of remembering. Bloom et al. (1956)
state, 'comprehension' represents the lowest level of
understanding or apprehension and the individual knows what
is being communicated, can make use of the material or idea
being communicated without necessarily relating it to other
material or sees its fullest implication.

By 'application' they mean the use of abstractions. The abstractions may be in the form of general ideas, rules of procedures or generalised methods. The abstractions may also be technical principles, ideas and theories which must be remembered and applied.

The term 'attainment' in this study refers to knowledge, comprehension, application, and total achievement of pupils. The argument may be forwarded for considering pupils' attainment at three levels of cognitive domain firstly, for attaining the curriculum objectives as have been considered by the Education Commission (1966), secondly, research evidences in general are very few in these specific levels and even fewer in Indian contexts. Whatever researches have however, been completed so far in the Centre of Advanced Study (CASE, Baroda) they only show some inconsistent findings.

1.8.0 Objectives

The study was undertaken to fulfil the following two broad objectives :

(1)   To find out the effectiveness of Strategy S_1 (Lecturing and Questioning-Answering), Strategy S_2 (Lecturing and Questioning-Answering by using Behavioural Objectives), Strategy S_3 (Discussion by using Instructional Materials) on the development of knowledge, comprehension, application, and total achievement in Geography of Standard IX pupils.

(2) To find out the effectiveness of Strategy S_1, Strategy S_2, and Strategy S_3 on the retention of knowledge, comprehension, application, and total achievement in Geography of Standard IX pupils.