REVIEW OF LITERATURE

During the last fifty years or so, researchers have spent a good deal of time and effort in an endeavour to identify the characteristics of effective teachers. But they have not been unanimous in their conclusions. In their futile attempts to be successful, they have shown relationship between several dimensions of teacher behaviour and the various criteria of teacher effectiveness. One tendency shown is to be friendly, warm, supportive, non-threatening and emphatic. Teachers who exhibit this tendency are thought to be more effective because they produce inter-personal relations favourable to learning in their classrooms. Many writers have stressed the importance of training teachers to be experts in the field of human relations. Very little is known about the relative effectiveness of available methods and techniques. Such knowledge is urgently needed to aid in the designing the more effective teacher education programme.

2.1 Early Researches

There exists a number of studies on classroom

interaction analysis and modification of teacher behaviour,
teacher effectiveness and micro-teaching which may help in
finding out a number of variables of teacher behaviour relat-
ed to affective aspect as well as cognitive aspect of
teaching-learning process. Anderson (1945, 1946, 1959) might
be considered as one of the pioneers in researching the
affective environment of the classroom. Withal (1949, 1951)
pointed to importance of the social and psychological climate
of the classroom. He categorised the teacher statements into
seven classifications and came to conclusions that: (i)
dependence of the learner upon the teacher is not desirable,
(ii) offering opportunity for the learner to make free
choices is desirable, and (iii) with the verbal expression
of understanding by the teacher problem-solving is enhanced.
Perkins (1951) discovered that differences in social-emotion-
al climate of the classroom promoted significant difference
in group learning. Medley and Mitzel (1959) reported positive
correlations between the emotional climate of classroom and
rapport in pupil and teacher and group problem-solving.
Investigations of Burell (1951) and Beauchamp (1952) showed
that pupils exposed to teachers trained in group processes
and emotional needs of children made greater gains in
achievement than the pupils exposed to teachers not so
trained. Studies by Furst and Amidon (1962, 1965) and
Giammatteo (1963) were related to the teaching styles of
teachers. Investigations by Amidon and Giammatteo (1965)

and Soar (1966) revealed that teachers with more indirect
teaching styles produced greater evidence of growth in
reading comprehension. Powell (1968) found similar results
in arithmetic achievement. Furst (1965) discovered a
positive relationship between greater achievement and:
(i) indirect teacher influence, (ii) amount of student talk,
and an average rate of teacher-pupil interaction.

The results of one of Flanders' (1960,a) first
studies revealed that pupils learned more from indirect than
from direct teachers. Weber (1967) disclosed that pupils of
indirect teachers received higher creativity scores than
pupils of more direct teachers. Also using pupils' ideas
involves powerful affective as well as cognitive components.
Emmer (1968) found that teachers who increased their use of
pupil ideas elicited increased pupil initiation. In the
study by Soar (1966) teachers' use of pupils' ideas did not
have a significant correlation with any of the achievement
measures. Similarly Snider (1966) and Furst (1967) did not
find significant results. But Lashier (1965) obtained signi-
ficant results. This variable has not been singled out for
intensive study as yet.

Studies related to cognitive aspect of teaching are
difficult to compare. Smith and Meux (1963) were two of the
first researchers who carefully considered the logical
aspects of teaching behaviour whereas Write and Proctor(1961)

proposed that mastery of subject matter is a key to teacher effectiveness. Bellack, et al. (1963) were concerned with the meaning of language used by teachers and learners in the classroom. Taba and her associates (1964) focussed their research on the thinking process of children. The cognitive aspect of teaching has received comparatively little attention. There are only two aspects namely, the frequency of questions and types of questions which can be isolated in the area of cognitive behaviour. Conners and Eisenberg (1966), Wallen (1966), Harris et al. (1968) and Rosenshine (1969) studied the frequency of questions. Solomon, et al. (1963) found that higher frequencies of any type of questions were associated with higher achievement. Thompson and Bowers (1968) studied the effect of convergent and divergent questions. Both Soar (1966) and Furst (1967) found evidence for the superiority of variation in questioning.

2.2 Teacher Education

2.2.1 Teacher Effectiveness: A Review of Reviews

Anderson and Hunka (1963) spotlighted problem areas on teacher effectiveness. They discussed studies which have used predictor or criteria variables and concluded that this research has reached a dead end. Attempts to build a theory of teaching from statistical description of what is happening fail to prescribe what should be happening.

Gage (1965) considered why researchers try to find out rela-
tionships between teacher characteristics and pupil growth
when their rewards are so meagre. He concludes that a review
of literature allows for selection of five global characteri-
stics which seem to be components of effective teaching.
They are: (i) warmth, (ii) cognitive organization, (iii)
orderliness, (iv) indirectness and (v) problem-solving
ability.

Medley and Mitzel (1963) substantiate Gage's conclu-
sion that much of the work on teacher effectiveness must
be discarded as irrelevant either because of criteria of
teaching effectiveness have been invalid or because no
objective measures of teacher behaviour have been used.
Fattu (1962) and Howsam (1960) both reviewed the research
on predictor criteria and teacher effectiveness. They came
to the conclusion that such research has failed to substan-
tiate links for such characteristics as intelligence, age,
experience, cultural background, socio-economic background,
sex, marital status, score on aptitude tests, job interest
and special aptitudes. Professional knowledge has proved
to be/more successful predictor, particularly of teaching
performance.

Both Biddle (1964) and Soar (1964) after reviewing
research on teacher effectiveness declared a need for
agreement about the effects that the teacher is to produce

in order to determine the components of teacher effective-
ness. They distinguished between research components of
teacher effectiveness and the criteria components. To them
teacher effectiveness is that in which relationships between
teacher characteristics and behaviour and output is measured.
Criteria component is a question of selecting the pupil out-
put components, considered to be desirable.

Bellack and Huebner (1960), and Amidon and Simon
(1965) reviewed the studies which focus on teaching. The
findings relate to teacher behaviour as measured by various
classroom observational techniques. Smith (1962) and Ryans
(1963) discussed the need for conceptual frame work for
understanding the findings on teacher effectiveness. Smith
reviewed four major studies on teacher effectiveness and
remarked that the value of these studies lies in their
description of what the teacher is doing rather than in
trying to label the teacher with a global title such as
autocratic or dominative. He pointed out that there are
probably no pure types of teacher, and therefore, the
teacher behaviour should be so described that the particular
mixture of teaching behaviour are not burried under broad
category headings. The progress in research on teacher
effectiveness during the past decades has been owing to the
further development of techniques for analysing verbal
communication.

2.2.2 Interaction Analysis - Pre-Service and In-Service Teacher Training

A number of investigations are centred on the use of interaction analysis with student-teachers and in-service training programme (Flanders, 1960(a), Storlie, 1961; Flanders, 1963; Hough and Amidon, 196 (a), 196 (b); Kirk, 196 ; Amidon, Furst, Simon, Hough, Kirk and Zahn, 1965; Amidon, 1966; Hough and Ober, 1965; Moskowitz, 1966; Simon, 1966; and Ober and Hough, 1967). Generally the results of these investigations indicate that student-teachers trained in the use of interaction analysis: (i) stimulate a greater amount of student initiated verbalization; (ii) offer fewer directions; (iii) utilizes more indirect teaching pattern; and (iv) more frequently accept and use student ideas.

But teacher-educators and researchers in the field who are involved in pre-service and in-service education of teachers want to know whether the training to increase the use of certain behaviours and decrease their use of others results in modification of teacher behaviour or produces gains in pupils' learning. For answering such questions, experimental studies must be conducted and reviewed. But certain types of experimental studies are relevant to this question, in which: (i) a number of teachers were trained to teach a class of pupils in a certain manner; (ii) observational measures were obtained to verify that the teacher behaved as intended; and (iii) end of

experimental measures were obtained.

2.2.3 Classroom Experiments in
        Indirect Teaching

Some excellent experiments, such as those by Amidon and Flanders (1961) and Schantz (1963) were conducted. As only one teacher was used in those experiments the findings could not be generalized to teacher training programme. Rosenshine (1970) has reviewed the following four studies which meet the above criteria.

In the study by Miller (1964, 1966) four teachers each taught four lessons in a "responsive manner" and in a "directive manner". Miller used rating scales to determine teacher fidelity to treatment, and therefore, specific estimates of teacher indirectness or directness could not be obtained. Findings relate that the pupils in the responsive condition viewed the lessons more favourably and exhibited significantly higher levels of thinking than did pupils in classes taught under the directive condition.

Gunnison made an experiment (1968) with 10 student-teachers whose teaching styles were predominantly-direct i.e. I/D ratio lower than .25. The five randomly selected teachers in the experimental group received six hours of instruction in interaction analysis; the control group received no instruction in interaction analysis. All ten teachers were

observed as they taught a special unit on India for ten class sessions in the ninth grade social studies classrooms. The experimental teachers used significantly more extended indirect influence, were significantly more indirect in responding to pupil comments and had classrooms with significantly more student talk. The pupils in the classes of experimental teachers gave them significantly higher ratings on 8 of 15 items on the attitude questionnaire.

In a study by Herman, et al. (1969) ten teachers were selected, all of whom had taught in their school for at least two years. Teachers were matched according to I/D ratio and divided into two groups. Each group taught six week long two social studies units; one unit was taught in a teacher-centred manner, and the other unit in a student-centred manner. Direct observation confirmed that the treatments were operative at least two-thirds of the observed time. The trend appeared to favour teacher-centred instruction in one unit and student-centred instruction in the other unit.

Carline (1970) experimented with elementary school teachers. They were trained to use more indirect teaching behaviour. The in-service programme was successful in modify -ing the behaviour of the experimental teachers toward more indirect teaching but there was no significant difference in the achievement of pupils in both the groups. These

experimental results stand in sharp contrast to the conclusions which Flanders and Simon (1969(a),1969(b)) drew from correlational types of studies.

Although the results of these experimental studies on indirect and direct teaching are disappointing, but it is only through experimental studies it may be determined whether teacher training procedures lead to modification of teacher behaviour and enhanced student achievement (Rosenshine, 1970).

2.2.4 In-Service or Pre-Service Training -
        Presage and Process Variable

After an observer has watched some teaching and wishes to make a suggestion, it is difficult to decide what can be said to the teacher in order to help him act differently during his next performance. How are the observations to be recorded? How can they best be displayed so that the trainee can understand? How much change occurs from one trial to the next? Here the presage variables are one or another kind of training programmes, kind of feedback,or pre-teaching experience. The process variables are measures of teaching behaviour (Flanders and Simon, 1969(b)).

Gage (1963(b)) developed a questionnaire to be completed by pupils in which they rated their present teacher and also indicated their preferred or ideal teacher. In this study eightysix sixth grade teachers were given the

reactions of their pupils once a month for part of the
school year. Ninety teachers did not 'receive the feedback.
On 10 of 12 scales the pupils perceived a shift toward
their ideal type of teacher during the course of the study;
four of these shifts were statistically significant in
comparison with the control group data. Bowers and Soar
(1961) examined the relationships between human relations
training, teacher personality and teaching behaviour for a
sample of fiftyfour elementary school teachers. Soar (1966)
based his study on a set of criteria measures of teacher
effectiveness developed by factor analysing process and
product measures together. Flanders and others (1963)
investigated the effects of teaching experienced teachers
how to analyse verbal statements so that they could study
their classroom interaction. Pre-training and post-training
measures of verbal interaction were analysed in terms of
the two types of in-service training programmes viz.clarify-
ing ideas suggested more often than done in the other treat-
ment.One programme showed more evidence of change than the
other.

2.3 Literature Related to Micro-Teaching

2.3.1 Origin and Development

Before describing the research on micro-teaching
it seems appropriate to review briefly some of the factors
leading to the development of micro-teaching at Stanford
University and other Universities.

One of the basic factors was a dissatisfaction with research on teaching. In a review of educational research Gage (1966) criticized the present status of research on teaching by stating that although this is a very important area of research, it has yielded very few significant results. Moreover, he feels that research on teaching has been neglected to the point that it is far behind other areas of educational research. One of the main unresolved problems of research on teaching had been to develop a criterion of teacher effectiveness. Walker (1935) wrote, "The lack of an adequate, concrete, objective, universal criterion for teaching ability is thus the primary source of trouble for all who would measure teaching."

It was while looking for a solution to the criterion problem to researchers on teaching that Gage wrote,

> One solution within the 'criterion of effectiveness' approach may be the development of the notion of micro-effectiveness', rather than seek criteria for the overall effectiveness of teacher in the many varied facets of their roles, we may have better success with criteria of effectiveness in small, specifically defined aspects of the role. Many scientific problems have eventually been solved by being analyzed into small problems, whose variables were less complex. (Gage, 1963(b)).

He then suggested that complex act of teaching be divided into less complex skills, following the need of scientific criteria of effectiveness for each of the skills

to be developed. It was about the same time that the Stanford Centre for Research and Development in teaching adopted what is now known as the technical skills approach. The micro-teaching clinics were the result of this new approach.

2.3.2 Micro-Teaching at Stanford

Micro-teaching was developed by the College of Education at Stanford University as an experimental teacher education programme supported by Ford Foundation. The purpose of micro-teaching was to give prospective interns as much practice teaching as possible under controlled conditions before they began their year of internship.

The first micro-teaching clinic was held during Stanford Summer Session 1963. The trainees were randomly divided into two groups. One group was given the Stanford pre-internship programme including observation of teaching. The other half worked in the micro-teaching clinic. The total act of teaching was broken down into several specific skills: (i) establishing set, (ii) establishing appropriate frame of references, (iii) achieving closure, (iv) using questions effectively, (v) recognizing and obtaining attending behaviour, (vi) control of participation, (vii) providing feedback, (viii) employing reward and punishment (reinforcement), and (ix) setting a model. The importance of analyzing and initiating model behaviour is a basic assumption supporting the use of observation in training   -

programme. (Bush and Allen (1964).

Before the training phase of the micro-teaching clinic each intern taught a short diagnostic lesson to a group of five secondary school pupils. These diagnostic lessons were observed by a supervisor and recorded on video-tape. During the clinic the interns received formal training in each of six skills selected for the training purpose. Although the supervisor evaluated each session, self-evaluation by the intern was stressed. After replanning, the same lesson was taught to different micro classes.Pupils also evaluated the lessons.

It was found that the trainees in the experimental teaching group achieved a higher level of competence than the control group. The trainees' performance in the micro-teaching clinic also proved to be a good indication of future performance in the subsequent internship. Pupil rating of teaching performance were more reliable than those of supervisors. Moreover, those trainees who had received pupil appraisal improved significantly more than the trainees who had been evaluated only by supervisors. During the micro-teaching clinic there was a significant improvement in the trainees' skill in self-evaluation. Finally, the trainees felt that the micro-teaching clinic had been a very valuable experience.

Summer micro-teaching clinics became a regular feature of teacher training programme at Stanford.Results based on pre and post tests during the clinic and the supervisory reports made during the first month of internship training were essentially the same as those of the 1963 clinic (Allen and Fortune, 1965). Two important changes were made in 1966 clinic. The first was to construct instrument to evaluate student-teacher progress in each of the teaching skills and second was to introduce change in the time schedule for teach-reteach lessons. Now a fifteen minute interval was given to the intern to replan his lesson before the reteach. There was a significant change only when more than one teach-reteach cycle was used with a specific skill. Micro-teaching did not remain primarily for pre-service preparation. Allen and Clark (1967) listed its applications in: (i) improving the skills of experienced teachers, (ii) refining the skills of supervisors, (iii) evaluating teaching performance, (iv) piloting and assessing new materials and techniques, and (v) research in teaching.

Due to years of creative experience, the research on micro-teaching and teaching skills at Stanford has taken the form of experiments in which various treatments to the trainee are manipulated (Gage,1972). Independent variables fell into three categories: practice variables, feedback variables and demonstration variables. Along with them other independent variables have been identified, such as the

timing of reinforcement, the amount of practice and the
amount of feedback, From its inception as a simple device
for the training of secondary school teachers in a few
selected teaching skills, micro-teaching has grown to the
point where multiple specific applications are in use at all
levels of education, from the elementary school to the
University. Pre-service as well as inservice micro-teaching
clinics and workshops have been established in many univer-
sities throughout U.S.A.

2.3.3 Micro-Teaching in Other
       Universities of U.S.A.

In an attempt to find out enough teaching stations
for 500 student-teachers each semester Brigham Young
University adopted a modified form of micro-teaching in
1966. The procedure used at Brigham was to have trainee
presenting a four or eight minute lesson to a micro-class
of three to five pupils. When these pupils were not avail-
able peers from the college class were substituted. The
presentation was evaluated by the class instructor, the
micro-class, and the peer class, Specific suggestions for
improvement were made. The length of time between the teach
and reteach lessons varied from one day to a week. The aim
of each presentation was to teach specific techniques (Belt
and Hugh, 1967). It was concluded that micro-teaching offers
an unique opportunity for the individualized instruction of
teacher trainees, provision for different types of classroom

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situation or problems may be made, the use of videotape
enabled the trainee to arrive at some conclusions in regard
to his effectiveness in the teaching situation, and perfor-
mance of student-teachers is usually improved.

There are other examples of usage within the field
of education. At the University of Massachusetts, the regular
pre-service micro-teaching clinic is supplemented by an
intensive summer workshop to train school personnel who can
then return and establish micro-teaching clinics and practice
on a local basis. A teaching technique laboratory was
organized at the University of Illinois to function as a
service unit for instructors in the teacher education
programme. Arye _ Perberg utilized micro-teaching in the
preparation of vocational education personnel and in the
refinement of teaching skills among University professors.
The laboratory provided different combinations of pupils,
rooms, materials and hardware for each course in the teacher
preparation sequence. After instruction in the technique the
student-teachers were referred to the Teaching Technique
Laboratory (Johnson, 1967). Johnson and Knaupp (1970) studied
the expectations of supervisor for a micro-teaching experi-
ence. They concluded that the supervisor should be able to
render technical assistance in planning conducting and
evaluating instruction and should provide an unhampered oppor-
tunity to student-teacher to find their own style of teaching.

Hoffman studied the classroom behaviour of teachers in
Michigan State University. Bloom (1969) described the
practice of using micro-teaching clinic in the intern teach-
ing programme of the University of Wisconsin, Milwaukee.
Mccollum and Laude (1970) made an effort to avoid the non-
real situation through the elementary programme for inner
city teachers of Temple University. Use of micro-teaching
was made as an analytical device in assessing the variety
of teaching strategies and techniques used by student-
teachers in a classroom setting. Bell (1970) started experi-
menting with micro-teaching in home economics education at
Texas Technical University in 1967-68. Rocky Mountain Educa-
tional Laboratory Project was directed by Meier (1968) in
six college and University campuses. It concerned the pre-
service teacher education programme. At the University of
Maryland, David B. Young has used micro-teaching in teacher
education centres to train centre faculty members to work
with student-teachers within the centres and to develop the
teaching skills of student-teachers. Young and his associat-
es have also used micro-teaching and selected self-analysis
techniques at Johns Hopkins University to individualize pre-
service training and internships for prospective teachers.
The use of micro-teaching to train Peace Corps Volunteers
is an excellent example of its flexibility with unique
teacher training objectives.

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The normal classroom setting contains so many
variables that precise research is virtually precluded. But
many issues related to its most effective use have not as
yet been resolved. There seems no convincing research eviden-
ce regarding the maximum number of pupils for micro-teaching
sessions. Impact of pupil characteristics upon the success
or failure of teacher training session and the impact of a
variety of different timing and sequencing arrangements
within the micro-teaching setting need careful examination.
The available literature which focus on the interactions
between pupils and teachers to determine the relationships
between teacher performance and pupil performance may not
be the only justification. Those things have to be taken
care of.

2.3.4 Far West Laboratory for
Educational Research and Development

Kallenbach and Gall (1969) started research in the
Educational
Far West Laboratory for/Research and Development taking the
subjects from the Education Department of San Jose State
College during the summer of 1966. The study was conducted
for the purpose of gathering more data relevant to the
issue of whether interns trained by micro-teaching have a
superior classroom performance when compared with interns
conventionally trained. The research design used for the
purpose was similar to those employed by Allen and Fortune
(1966) but with two additions: (i) whereas their study

assessed post-training teaching competence by performance in a micro-teaching situation, the present study assessed teaching competence of interns both in micro-teaching as well as in ⁻ⁱ⁻ actual classroom situation⁻ and (ii) in their study teaching competence is assessed after a summer period of training. Also, the subjects were assessed at the beginning of their first year of intern teaching. In addition to these, their study involved secondary school interns whereas the subjects in the present study were all elementary school interns.

Prior to the 1966 summer training programme, each of the thirtyseven subjects was assigned to one of two training groups; micro-teaching or the regular student teaching programme. The two groups did not differ significantly from each other on any of the variables as: age, sex, mean graduate point and marital status of the groups. Both the groups took the same course work, lasting 10 weeks from June to September.

The student-teaching group was placed in several nearby school districts which had summer school programmes. Each subject observed, aided and taught 10 hours a week for an average of 5 weeks in the classroom. They also attended a class with the micro-teaching group in which specific teaching skills in the areas of lesson preparation and presentation and teacher-pupil rapport were discussed. Both

the groups were encouraged to use these skills in their teaching, but only the micro-teaching group was told to prepare a short lesson the next day on which the skill would be practised. This lesson was taught to 4 or 5 students. Subjects reviewed the videotape of their lesson with a supervisor experienced in micro-teaching methods, and in addition received written evaluations from the students. In the same session subjects replanned and retaught the lesson to a different group of students.

Prior to the beginning of the training programme, each subject was required to teach a five minute diagnostic lesson which was videotaped. Assessment of teaching competence was made after the subjects began teaching in the schools during 1966-67 academic year.

Although micro-teaching was not ; found to be superior to conventional training methods in its effect on teachers' classroom performance, the authors believe it would be misleading to conclude that micro-teaching represents little real or potential improvement in training teachers. Instead, the authors interpret the findings indicating that micro-teaching is a superior training strategy since it achieves similar results when compared with conventional training methods in only one-fifth of the time. In addition to economy of time, micro-teaching involved practically none of the administrative problems

incurred by faculty and interns in arranging for conventional classroom observation and teacher aid experience. An incidental finding of the study was that ratings of teaching performance based on brief videotaped lesson was generally good predictors of later ratings of teacher effectiveness.

2.3.5 Mini Courses Involving Micro-Teaching

The Far West Laboratory for Educational Research and Development has been experimenting with what is called a 'Mini course', designed to help change teaching behaviour. The team of Borg, Kallenbach, Kalley, Langer, Morris and Friebel (1968, 1968) has reported one evaluation for experienced teachers and one for college students who were starting their student-teaching. A mini course was completed by fortyeight experienced teachers. There was no control group. In the second project, the mini course was taken by students at three colleges. At each of two colleges there was an experimental group and a control group. The two experimental college groups and all of the experienced teachers made full use of video playback in their mini course. The two control groups made use of the mini course, practised teaching skills in a micro-teaching format, but did not see themselves in a video playback. The third control group, at the third college, was given some course material, but many students in this group failed to find the time to complete all phases of the mini course.

The preliminary evaluation of the mini course indicated that college students and experienced teachers can make changes in their behaviour. There were more significant differences among the fortyeight experienced teachers, and fewer among the various college student groups.

The mini course consists of printed instructional materials as well as sound films which instruct the trainee. It is a self contained package to be sent out to teachers to be used in changing their behaviour. Some fifteen or more courses have been developed.

2.4 Micro-Teaching Used in United Kingdom

In United States many of the colleges and universities are using micro-teaching. In Britain Stirling University and Ulster University had begun preparing teaching programmes in 1968 (Brown, 1971). Work at the University of Stirling (Perrot and Duthie, 1970) examplifies very well the utilization of micro-teaching in an integrated teaching system in a way to avoid the weaknesses of the traditional system. It was real teaching not simulation.

At Ulster, micro-teaching is being used as a method of training, as a research tool and as a means of integrating theoretical and practical studies (Brown, 1971). All education students spend weekly sessions for two semesters in micro-teaching laboratories. They receive lectures and

demonstrations on the major component skills and attend
curriculum resources, seminar for guidance in selecting
appropriate materials for their micro-teaching tasks. The
parallel course in psychology and social psychology is geared
to the micro-teaching programme.

In the second semester student-teachers planned a
series of six linked lessons on one topic or theme. The
number of pupils increased from five to ten and the length
of the lesson from ten to twentyfive minutes. They were
expected to set precise curriculum objectives and to measure
changes in pupils' knowledge and skill. In this, student-
teachers moved through the courses from the relatively simple
task of teaching one concept in ten minutes to five pupils,
to a situation which is half way towards normal teaching.
Supervisor and student self-ratings on assessment schedules
were obtained for each micro-teaching cycle and at the end
of each semester, independent observers rated a sample of
student-teacher lessons. This is part of a general research
enquiry being conducted on the effectiveness of micro-teaching
with or without videotape playback and with or without verbal
interaction training (Flanders, 1970). In addition to this
there were two control groups, one studying education but
not undergoing teacher-training and the other not studying
education or training to teach.

Student-teacher attitude to micro-teaching was on
the whole favourable. Over eighty per cent of the group in

1969-70 expressed satisfaction with the course on an opinion-
aire. Experience at Ulster suggests that micro-teaching is
worth considering by any college or department experiencing
difficulties in finding teaching practice places and looking
for ways of improving their training programmes and measuring
their effectiveness (Poppleton, 1968). This is not to say
that micro-teaching should replace all block practices or
that it is a panacea for teacher education. It is, however,
probably the most significant break through in teacher train-
ing since the block practice was first instituted (Brown,
1971).

2.5 Micro-Teaching in Developing Nations

Over two years' experience with demonstration
lessons and micro-teaching has shown that without trespass-
ing too greatly on students' times, a continuing practical
attempt can be carried on throughout the training courses
(Lawless, 1971) with the original Stanford model (Allen,
1968), Perlberg (1970), Evans (1970) and Jacobsen (1970)
where closed circuit television and a videotape recorder
were used. The cost of the equipment, the difficulty of
obtaining regular servicing and the time required to set it
up may outweigh the advantages. The feedback provided by
discussion with a tutor and a group of observers was found
extremely effective in an experiment on micro-teaching
without the use of hardware development in the University

of Malawi, Nairobi. However, it was conceded that C.C.T.V. might add something to these discussions, but probably not sufficient to justify the cost and effort required to obtain and run it.

Demonstration lessons were introduced in 1968 as introductory experience for student-teachers. Firstly, a simulated situation was used, the class was composed of college student-teachers who played the role of school pupils. Secondly, teach-reteach pattern was not followed. Thirdly, the stress was on the controlled and structural observation of the lesson by fellow student-teachers, who took part in discussion and analysis of the lesson. Fourthly, resources did not permit the purchase and use of C.C.T.V. and videotape recording equipment. While the lesson was being taught, student-teachers took detailed notes of events and discussed the lesson for 10-15 minutes afterwards. Through the discussion student-teacher received the feedback on his lesson.
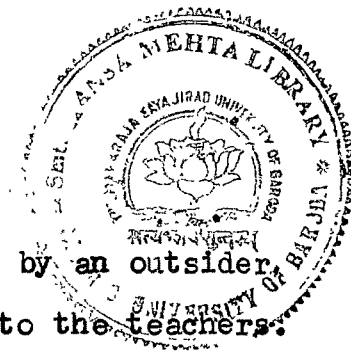
However, it was felt that willingness to give and accept criticism both from tutors and fellow student-teachers was an important part of the teachers' equipment and a valuable tool. While teaching, a student-teacher may forget or overlook a point not clearly made, a question badly answered or an activity incompletely organized; but these were picked up by the observers and brought up for

discussion. Through acting as observers student-teachers were put in the position throughout their course of facing an active teaching situation in which they had to comment and to which they could relate their own experience. It was realized that analyzing teaching techniques had important effects on the student-teachers whole approach not only to their teaching skills and to the subject education but also to the whole range of their academic work at college by focussing attention continually on the practical aspects of teaching.

2.6 Studies in India

2.6.1 Interaction Analysis and Teacher Behaviour

Classroom interaction analysis caught the attention of research workers in India as early as in 1963. Mehta (1967) while working on 'Motivation Development' project paid attention to the problem of 'understanding and changing Teacher Behaviour' in the light of classroom interaction analysis. All the ideas pooled together present a proper perspective and form the content of a booklet: 'Understanding Classroom Behaviour - A Manual'. Department of Educational Psychology and Foundations of Education in the National Institute of Education undertook a project on 'Changing Teacher Behaviour Through Feedback'. Feedback was based on (i) self-rating, (ii) peer-ratings and (iii) pupil-ratings of teacher classroom behaviour. In addition to these ratings

results of classroom interaction analysis by an outsider,
trained observer was given as a feedback to the teachers.
Flanders ten-point observational tool was used in this study.
This study reported by Roy (1972) found the presence of
certain significant functional relationships borne by (i) sex
of the teachers and (ii) teaching materials on the patterns
of teacher influence in the classroom.

Pareek and Rao (1971) in their study designed the
experimental group of ten teachers who were exposed to ten
days training programme on interaction analysis which
emphasized feedback of classroom interaction behaviour
through Flanders' interaction categories, their interpreta-
tions, experimentation with new behaviour patterns through
role plays and actual practice teaching as inputs of treat-
ment. A control group was assessed during post-treatment
period for comparison purposes whereas experimental group
was observed and coded for their interaction behaviour
before the treatment and at various intervals after the
treatment. It was found that due to the training the
experimental group started using more and more of 'praising',
'encourag-
ing', 'accepting ideas' and 'questioning' compared to
the control group of teachers as well as their own
behaviours before training.

Buch and Santhanam (1970) were the pioneers in this
field when they made an exploratory study of the possibility

of using Flanders ten category system of classroom analysis in Indian schools as well as to explore the classroom behaviour of teachers of English as exhibited through the teacher-pupil verbal interaction. They concluded that the numerous and far reaching inferences that have been made through interpretation of the matrix are enough evidence to indicate the usefulness of Flanders ten-point scale of measuring classroom interaction to study teacher behaviour and vouch for its usability in Indian conditions. The interaction analysis as an index of teacher effectiveness possesses great potentialities both in teacher training programmes and in-service training programmes wherein desired modification of teacher behaviour might be attempted in the light of the interaction analysis results.

Buch and Santhanam (1972) and Santhanam (1972) are the only two studies using systematic observations of classroom behaviour of teachers using Flanders Interaction Analysis Category System to describe the behaviour patterns of teachers across subjects, grades, sex, qualifications and age of the teachers. Santhanam studied relationship between non-personality variables of teacher and his classroom behaviour.

Quraishi (1972) studied relationship between teachers' personality variables and their classroom behaviour using Flanders Interaction Analysis Category System. He found only teacher attitudes to be associated

with classroom behaviour of teachers.

Jangira (1972) reports an experiment in modifying
classroom behaviour of teachers using feedback on Flanders
Interaction Analysis Category System. He found that higher
responsiveness, flexibility in teacher influence and indirect-
ness resulted in higher adjustment, classroom trust behaviour
and independence. Pangotra (1972) in an experiment to study
the effect of different sources of feedback on student-
teachers found that feedback from supervisor was more effecti-
ve than feedback from peers, researcher as well as pupils.

Sharma (1972) in her experiment, studied the effect
of four different patterns of classroom behaviour of teachers
on pupils' achievement in relation to knowledge, comprehen-
sion and application as instructional objectives. Flanders
Interaction Analysis Category System was used for training
the teachers in the behaviour patterns selected for the
treatments.

2.6.2 Micro-Teaching and Teacher Behaviour

Tiwari (1967) completed a project on micro-teaching
in Government Central Pedagogical Institute, Allahabad
during November and December 1966. The whole approach was
pupil biased. It had no consideration of improving teacher
behaviour. Student-teachers were used to organize the
remedial and enrichment programme for children. The study

had the following objectives:

- to make a study of the pupil in respect of his
  socio-economic status and family environment,

- to locate the areas of his weaknesses and
  strengths in various school subjects,

- to provide remedial teaching to the underachievers
  and arrange for enrichment programmes for the rest,
  and

- to assess the impact of individual teaching on
  the pupils as well as of the student-teachers.
  Underachievers were arranged to the groups of two
  or three according to their common needs and
  difficulties, and received remedial instruction
  from the teacher in extra period. It was recommend-
  ed that the student-teachers should be suitably
  trained to diagnose the difficulties of an
  individual child and to prescribe or apply proper
  remedies in each case. Some element of individual
  teaching introduced in schemes of teaching in
  practising schools, the student-teacher may get
  an opportunity to develop an insight and make him
  better qualified for the job.

Shah (1970) made an experiment with micro-teaching
procedures. Seven students were taught by an experienced

teacher for seven minutes. It was recorded on tape and was replayed in the presence of the micro-teacher, principal and the observer. It was not a planned study, but a demonstration only.

Chudasama (1971) tried out micro-teaching procedure in student-teaching programme in M.S.University, Baroda for her M.Ed. dissertation. Six students formed the experimental group. They were given the practice in micro-teaching procedure while the student-teachers forming the control group were not given practice in micro-teaching procedure. Micro-lesson lasted for seven minutes. During the micro-lesson, the interaction between the micro-teacher and seven pupils of the class was recorded with the help of Flanders Interaction Analysis Category System. The investigator working as observer provided the feedback to the student-teacher. Statistical analysis on comparison of I/D and i/d ratios showed no significant difference between the control and experimental groups. The investigator admitted his limitations and concluded that the experimental group was able to change its behaviour as a result of treatment given to it.

Marker (1972) made a comparative study of micro-teaching and conventional practice teaching of student-teachers of geography method. Her main objective was to investigate how micro-teaching compared with conventional teaching of student-teachers results in an effective

technique. The idea was to construct a plan of micro-teaching
suitable to existing conditions of teacher education in India.
The outline envisaged parallel group research. Skills select-
ed were: (i) set induction, (ii) stimulus variation, (iii)
questioning, (iv) reinforcement, and (v) closure. A checklist
was prepared for the observer, supervisor and tape recorder
was used. Provision for reteach was given after the discussion
and feedback.

It was concluded that tangible evidence of improve-
ment greatly increased self-confidence of student-teachers.
Micro-teaching provided remedial measures immediately. Work-
ing in groups micro-teaching enabled development of closer
relationships between peers and the supervisors and the
student-teacher. A greater amount of self control was
evident among the student-teachers who had undergone micro-
teaching than those who had not. Even the mannerisms were
rubbed out to a degree beyond the expectations of the
investigator.

2.7. Combining Interaction Analysis
with Micro-Teaching

Classroom behaviour descriptions provided by
interaction analysis are a source of useful feedback for
individuals desiring to change their teaching behaviour
(Amidon, 1967; Flanders, 1964; Furst, 1965; Hough, 1966).
Interaction analysis is also being used as a prescriptive

tool in micro-teaching. (Campbell and Minnis, 1970).

Programme which combine systems of coding verbal communication with micro-teaching have been implemented at a number of centres. According to Amidon and Rosenshine (1968) a training programme of this type was carried out at Temple University in 1961. In 1967 and 1968 programmes were further developed at Temple by Rosenshine and Furst and at the University of California at Davis by Minnis. The major advantage reported by those who conducted the programmes was greater specification of the skill to be practised and more objective information about the performance itself (Flanders, 1970).

Configuration of interaction analysis data which occurred during micro-teaching depend on the type of display selected, but the same observation procedure and the identical display format could be used when a teacher attempts to apply the same skills in a total class setting. In moving into the classroom and to longer periods of teaching, video playback becomes time consuming and therefore inefficient. Interaction analysis feedback is faster and can focus on specific skills, provided the behaviour patterns could be identified. It is quite possible that interaction analysis combined with micro-teaching would provide a potent training procedure for helping to develop and control teaching behaviour (Flanders, 1970).

2.8 Review of Literature and the Present Study

2.8.1 Conceptual Frame Work

It is truism to say that research should be guided by theoretical frame works. The process of teaching is complex. The programme of teacher education is likely to be even more complex. A sound conceptual frame work capable of both analyzing and synthesizing is the need of a researcher.

For a pre-service teacher education programme to be valid, relationships must be established between the treatment delivered in the programme and performance criteria in teaching. For the performance criteria to be valid, they must be shown to be either logically necessary to teaching or associated with pupil learning attributable to teaching. To demonstrate relationships between the performance criteria in teaching and treatments in preservice teacher education programme, certain strategies should be developed which may help pre-service teachers to modify their teaching behaviour and their consequent efforts could be tested against pupil growth.

The focus on performance criteria is developed firstly, on the basis of the literature available on behavioural objectives in instruction and secondly, through series of experimental studies which have been conducted in teacher education. These studies were designed to determine whether

training procedures could modify x the behaviour of the teacher as measured by systematic observation. The results of these investigations indicated that training procedures which focussed on specific behaviour were more effective than traditional method courses in changing teacher behaviour. There the emphasis is on specifics i.e. on performance criteria.

2.8.2 Experimental Studies

The best potential source of variables for teacher education programme is classroom experimental studies in which various instructional procedures are used, and the effects of these different procedures on pupils' growth are reported. In such studies the experimental teachers are trained to exhibit specific instructional behaviours, such as asking questions on a higher cognitive level (Rogers and Davis, 1970), using more praise and support of student ideas (Carline, 1970). The control teachers either follow their normal, natural procedures or use specified alternative instructional procedure. Therefore, the conclusions which can be applied to teacher education programme are from the studies related to teacher as the statistical unit of analysis, teachers or classes randomly assigned to treatment, observational data obtained on the teacher behaviour in experimental and control treatment and on the behaviour of the student and the student performance as assessed by a

variety of tests. They lead to the process-product research in the area of teacher behaviour.

2.8.3 Process-Product Variables

Of all the variables which have been investigated in process -product studies, five variables have strong support from correlational studies and six variables have less support but appear to deserve future study (Rosenshine and Furst, 1971). The five variables which yielded the strongest relationships with measures of student achievement are clarity, variability, enthusiasm, task-orientation and businessness like behaviour, and student opportunity to learn. The six less strong variables are: use of student ideas and/or teacher indirectness, use of criticism, use of structuring comments, use of discourse, probing and perceived difficulty of the course. The relationships are positive for ten of the variables and negative for use of criticism. Considerable correlational and descriptive studies have been conducted using interaction analysis. Rosenshine and Furst (1971) reported that eight studies have been found in which counts of total use of student ideas and/or counts of extended use of student ideas were correlated with measures of student achievement. In seven of the eight studies correlations were positive (Flanders, 1970, 4th grade, 6th grade, 7th grade, 8th grade; Perkins, 1965; Soar, 1966; Wright and Nuthall, 1970). The consistency of these results suggests that the variable 'teacher use of student ideas' appears important
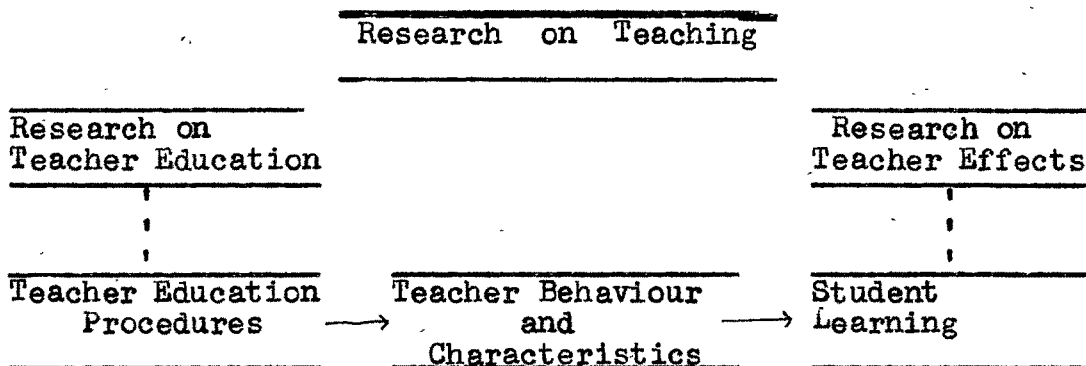
enough to change the teacher classroom behaviour.

Another variable derived from the Flanders Inter-
action Analysis Matrix has been labelled indirectness which
consisted of the combined frequencies of teacher behaviour
known as (1) acceptance of student feeling, (ii) praise or
encouragement, and (iii) use of student ideas. As reported by
Rosenshine and Furst (1971) significant results were obtained
in one study (Flanders, 1970; 6th grade), although positive
correlations were obtained in four of the five remaining
studies (Medley and Mitzel, 1959; Flanders, 1970, 4th grade,
7th grade, 8th grade). As the variable teacher use of student
ideas is part of the more general variable of indirectness,
the use of both variables in the experiment are useful. The
ratio of 'indirect' to 'direct' behaviour is significantly
related to pupil achievement in the study of La Shier (1965).
Positive correlations have been reported in eleven of thirteen
investigations reviewed by Rosenshine and Furst (1971). The
direction of the correlations show a strong trend - 'for
negative relationship between criticism and student achieve-
ment. Significant negative relationships between some form of
criticism were obtained in six studies (Rosenshine and Furst,
1971). The studies are Anthony (1967); Flanders (1970);
Harris, et al. (1968); Hunter (1969); Soar (1966) and Wallen
(1966, 8th grade).

2.8.4 Teacher Behaviour - Dependent and
Independent Variables

Research on teaching can be defined as the study

of relationships between variables, atleast one of which
refers to a characteristic or behaviour of a teacher. If the
relationship is one between teacher behaviour or characteri-
stics, on the one hand, and effects on students, on the
other, then it is research on teacher effects in which the
teacher behaviour is an independent variable. If the teacher
behaviour or characteristic serves as a dependent variable in
relation to some variable in the programme of selecting and
training teachers, then it is research on teacher education.
Both kinds of research taken together make up the field of
research on teaching (Gage, 1972). Gage has depicted
this relationship in the figure given below. The variables of
teacher behaviour and characteristics are at the centre. They
serve as independent variables in relation to effects on
student-teaching and as dependentx variable in relation to
teacher education.

Research on Teaching

Research on Teacher Education		Research on Teacher Effects
Teacher Education Procedures	Teacher Behaviour and Characteristics	Student Learning

2.8.5 Macro and Micro Research

Research on teacher education programmes may be of

two types, viz. macro research or micro research. Macro research could be on large groupings of elements as formulating objectives, selecting and organizing content, employing appropriate strategies, evaluating learning outcomes, and professional responsibilities. But the magnitude of macro research will depend upon the amount of micro research on the units or elements of programmes preceded. Therefore, a number of studies of the pre-test - treatment - post-test type may be anticipated to have made tremendous contribution through the development of hundreds of concepts to be used in macro research. Smith (1971) advocated to concentrate on the task of analyzing, specifying abilities, describing skills or techniques, and working out training materials for teacher education. If such curricular materials are developed and standardized 'treatments' could be plugged into micro research which would promote replicability of studies, then macro research on teacher education process may go hand in hand with carefully formulated evaluation procedures.

2.8.6 Move Towards Science

If some aspects of behaviour in the classroom are similar to those typically studied by the sociologists and others and are related to the behaviours studied by psychologists, then to account for these behaviours classroom analysis must either develop its own sociological and psychological concepts or draw upon those already developed

(Neujahr 1972) in other sciences. Research on teaching has come a long way in this direction. Where the earlier effort predicted teacher effectiveness on the basis of a few test scores, the later work aims to prove such effectiveness in specific skills on the basis of intensive and validated training procedures. The present-day work relies much more on specific behaviour than the earlier approach which was global and was difficult to practise, as the independent and dependent variables could not be pinned down or shifted from one situation to another. The more ⊙ recent work uses packages and products in the same form and meaning regardless of situation. This is an indication of the contribution of science to the art of teaching. Thus the search for a scientific basis for teacher education and the improvement of teacher effectiveness is reaching solid grounds with increased support and improved intellectual tools (Gage, 1972).