CHAPTER III:

RESEARCH DESIGN
(PLAN AND PROCEDURE)

3.1 Overview.
3.2 Design of the Study.
3.3 Sample
3.4 Tools to be Used.
3.5 Statistical Procedure.
3.6 Conclusion.
3.1 **Overview**

In the previous two chapters an effort has been made to explain the purpose of the study and its place in the historical perspective of the other studies already conducted in the field of teacher effectiveness and teacher behaviour. The widespread dissatisfaction with student teaching programme in our teacher training institutions provide the rationale for this piece of research. The existing global approach (Macro) universally adopted in our teacher training institutions for preparing and evaluating student teachers is not only being challenged on theoretical grounds but also have been criticised for the poor quality of products coming out of these institutions. The concept of microteaching has emerged as a training technique for analysing and modifying teaching behaviour. Thus teaching training institutions find some hope of bridging the existing gap in theory and practice in student teaching programme.

This has brought the area of microteaching in focus of research workers. As mentioned earlier
that studies in the area of microteaching using experimental design in Indian setting need to be conducted. The present study is an effort in this direction.

3.2 **Design of the Study**

One of the major objectives of the study is to modify the teachers' behaviour using microteaching technique. For the realisation of the above objective it is desirable to adopt experimental design. The selection of this method for the study can be justified on the ground that the effect of some independent variables on the dependent variables can be fruitfully observed. The design of the study is depicted in the diagram given below.
TABLE 3.1 SHOWING THE DESIGN OF THE STUDY STEPSWISE

\[ N = 32 \]

<table>
<thead>
<tr>
<th>PRE TEST</th>
<th>BARODA GENERAL TEACHER COMPETENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRAINEE</td>
<td>ORIENTATION TO MICROTEACHING</td>
</tr>
<tr>
<td>BARODA GENERAL TEACHER COMPETENCE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRAINING IN SKILLS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Supervisor as source of feedback</td>
<td>Using Peer Supervisor as source of feedback</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPERIMENTAL GROUP</th>
<th>EXPERIMENTAL GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>II</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>POST TEST</th>
<th>BARODA GENERAL TEACHER COMPETENCE</th>
</tr>
</thead>
</table>

The above shows the design of the study in which the different steps of the process of treatment are explained. In the first step Baroda General Teaching competence Scale was administered on the thirty two students who constitute the sample of
the study. In the second step all these thirty-two students were oriented to the technique of the micro-teaching and model lessons were presented before the students in the five skills which are taken up in the study. In the third step again Baroda General Teacher competence Scale was administered. In the next step training in the different five skills was given to the student teachers and they were divided into two groups: 1) Experimental group who received feedback by the supervisor and (2) Peer supervisor group who received feedback from the peer supervisors. These two groups were again sub divided into two groups, namely (i) Experimental Group No. I (ii) Experimental Group II (iii) Experimental Group III (iv) Experimental Group IV. When all the thirty-two student teachers were trained in the skills again Baroda General teacher Competence Scale was administered on them to get post test scores. So all these steps constitute the design of the study.

3.3 Sample

The sample of the study was acquired after passing through the following two stages:
1- During the session 1977-78, 250 women students were admitted to the B.Ed. class of Dev Samaj College of Education for Women, Ferozepur City. From the Admission Register every first and fourth student was picked up to be included in the sample. Thus 100 B.Ed. students became the sample at the first stage.

2- For the purpose of equating the group of these 100 B.Ed. students they were subjected to following tests:

(ii) Socio-Economic status scale by B. Kuppuswamy.
(iii) Junior index of motivation (JIM scale); adapted (Form F).

On scrutiny it was found that only seventy student teachers have filled the questionnaires completely. Therefore the results of seventy student teachers were calculated which are given in appendix I. On the basis of the results thirty two student teachers were identified who were almost similar on intelligence, socio-economic status (S.E.S.) and academic motivation which are tick marked in appendix II. Thus a group of
thirty two student teachers were spotted out which may be termed as homogenous group. For the purpose of treatment these thirty two students were divided as under:

Table 3.2 showing the nature of the group, sources of feedback and number of students in the groups.

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>NATURE OF GROUP</th>
<th>SOURCE OF FEEDBACK</th>
<th>NO. OF STUDENT TEACHERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>Experimental Group I</td>
<td>Supervisor</td>
<td>8</td>
</tr>
<tr>
<td>2-</td>
<td>Experimental Group II</td>
<td>Supervisor</td>
<td>8</td>
</tr>
<tr>
<td>3-</td>
<td>Experimental Group III</td>
<td>Peer Supervisor</td>
<td>8</td>
</tr>
<tr>
<td>4-</td>
<td>Experimental Group IV</td>
<td>Peer Supervisor</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

The student teachers in above table were given treatment to achieve the objectives of the study. The nature of the treatment is described in table 3.4.
3.4 Tools to be used

In order to collect data the following tests, questionnaires and interview/scheduled were used.

1- Standard Progressive Matrices Sets A, B, C, D & E.

2- Socio-economic status scale by B. Kuppuswamy.

3- Junior index of motivation (Jim Scale), adapted (Form F).

4- Baroda General Teacher Competence Scale.

5- Observation schedule for the skill of probing questioning.

6- Observation Schedule for the skill of stimulus variation.

7- Observation Schedule for the skill of explaining.

8- Observation Schedule for the skill of illustrating with examples.

9- Observation Schedule for the skill of re-enforcement.

The details about them are as under:

1- **Standard Progressive Matrices, Sets A, B, C, D & E**

As one of the objectives of the study was to equate student teachers on the intelligence variable so **STANDARD PROGRESSIVE MATRICES, SETS A, B, C, D & E**
prepared by J.C. RAVEN, M.Sc. was used to measure the intellectual level of student teachers. The Standard Progressive Matrices Test used in the study intends to measure the level of observation, clear and abstract thinking and reasoning. In my belief these are some of the basic qualities in a teacher, vis-a-vis the acquisition of different teaching skills. Keeping this in mind it was thought quite reasonable to use this test in the study.

The scale consists of sixty problems divided into five sets of twelve. In each set the first problem is nearly self-evident. The problems which follow become progressively more difficult. The five sets provide five opportunities to grasp the method and others to assess. To insure interest and freedom from fatigue, the figures in each problem are boldly presented, accurately drawn and pleasing to look at. Every one, whatever his age, is given exactly the same series of problems in the same order and is asked to work at his own speed, without interruption from the beginning to the end of the scale. The scale can be
given either as an individual, a self administered or as a group test. A person's total score provides an index of his intellectual capacity, whatever his nationality or education. Young children, mentally defective person and very old people are not expected to solve more than the problems of sets A & B of the scale and the easier problems of sets C & D where reasoning by analysis is not essential.

The administration of the test

The test was administered as per instructions given in the manual of the standard progressive matrices sets $A, B, C, D$ & $E$. The test was administered in two parts because of the large number of students. One hour was given to them to fill the forms of the test. One example i.e. A 1 was solved by the supervisor and then the student teachers were asked to turn over the next page of the test book and to do the next problems. Mistakes in the record form were checked by the supervisor according to the key of the test.

Scoring

The record forms were checked by the supervisors
and right or wrong answers according to the scoring key were marked. The total of the right and wrong answers was taken and according to that the intellectual level of each student teacher was established.

**Classification**

When the intellectual level of all the student teachers was established they were divided into different grades and ranks according to their chronological age percentile rank.

**TABLE 3.3 SHOWING THE KEY TO 1956 REVISED ORDER OF PROBLEMS:**

<table>
<thead>
<tr>
<th>SET</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td>4</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>2-</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3-</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>4-</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>5-</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>6-</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>7-</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>8-</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>9-</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>10-</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>11-</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>12-</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>
Grading Key of the Progressive Matrices (1938)

<table>
<thead>
<tr>
<th>Percentile Group</th>
<th>Grade</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>95 and over</td>
<td>I</td>
<td>Intellectually superior.</td>
</tr>
<tr>
<td>75 and over</td>
<td>II</td>
<td>Definitely above average.</td>
</tr>
<tr>
<td>Over 25 and under 75</td>
<td>III</td>
<td>Intellectually average.</td>
</tr>
<tr>
<td>25 and under</td>
<td>IV</td>
<td>Definitely below average</td>
</tr>
<tr>
<td>5 and under</td>
<td>V</td>
<td>Intellectually defective.</td>
</tr>
</tbody>
</table>

Reliability

The scale has a retest reliability varying with age from 0.83 to 0.93. It correlates 0.86 with the Terman Merrill Scale, and has been found to have a "G" saturation of 0.82. The norms for the self-administered or group test (adults) is given in the following table:

Table 3.4 showing the norms for the self administered or group test for adults.

<table>
<thead>
<tr>
<th>PERCENTILE POINTS</th>
<th>CHRONOLOGICAL AGE IN YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20</td>
</tr>
<tr>
<td>95</td>
<td>55</td>
</tr>
<tr>
<td>90</td>
<td>54</td>
</tr>
<tr>
<td>75</td>
<td>49</td>
</tr>
<tr>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>10</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>23</td>
</tr>
</tbody>
</table>
2- Socio-Economic-Status Scale

As one of the objectives of the study was to equate student teachers on the socio-economic-status variable, the socio-economic-status Scale prepared by B. Kuppuswamy was used to measure the socio-economic-status level of student teachers. The present scale was standardized primarily for use in socio-economic investigations in urban parts of India. The scale was prepared mainly to provide a simple instrument which could be used without spending much time and effort to obtain a correct measure of socio-economic-status of a person.

The Socio-economic-status scale has three variables covering seven items:

(i) Education
(ii) Occupation
(iii) Income

These three variables are explained by B. Kuppuswamy in the manual of socio-economic-status scale as under:

i) Education in
The aspect Education/the scale includes
the length and type of education. In the top category post-graduation education as well as high grade professional education are put together. The lower grade professional education which is post high school will be put in the third category. Those who have education in old type Sanskrit or other language Institutions will be categorised according to the duration of the course.

ii) Occupation

The professional group includes those people who are involved in decision making processes, in laying down policies and in executing them. Mostly they have high as well as professional education. To this category belong the doctors, senior administrative officers, readers, professors, principals of colleges, engineers, newspaper editors, architects, bank managers etc.

The Semi-professional group includes those occupations which involve post high school or college education and lower grade professional training. This category includes mechanical and electrical engineers of the technological institutions, high
school teachers, lecturers in the college, junior medical practitioners, insurance inspectors, commission agents, musicians, research assistant etc.

In the next category the persons included have some training in Arithmetic and probably also in reading and writing. The work here is of repetitive nature. This category includes the clerk, the typist, the accountant, the school teachers, the shop-keeper, farm owner, station master, guard, news correspondent etc.

The skilled workers are those with a long training in a rather complicated work. The mason, the carpenter, the mechanic, the engine driver, the telephone or telegraph operators etc. are included in this category.

To semi-skilled group belong all those who need some training to do their routine jobs efficiently e.g. factory or workshop labourer, laboratory or library attender, the car-cleaner etc.

All persons who are doing work which involves neither education nor training will come into the next category e.g. watch-man, peon, coolie, domestic servant etc.
The lowest category includes those persons who are unemployed irrespective of their general and professional education or training.

iii) Income

Though it is easy to get information about the education and occupation yet it is difficult to get information about income of the people. The only thing is that items are very broad and the slight errors will not make much difference.

So these three variables constitute the socio-economic-status scale. The scale is given below:

**ITEMS**

A. Education

1. Professional degree, Master's degree and above.
2. B.A. or B.Sc. degree
3. Intermediate or post high school diplomas
4. High school or its equivalent.
5. Completion of full course of elementary education or middle school.
6. Literacy or going to elementary school for a few years.
7. Illiterate.
B. **Occupation**

1. Higher professions like engineering, medicine, law, administration etc.
2. Semi-proessions.
3. Clerk, Shop-keeper, farm owner etc.
4. Skilled work.
5. Semi skilled work.
6. Unskilled work-domestic servant, farm labour, casual labourer etc.
7. Unemployed, dependant, beggar, vagrant.

C. **Monthly income**

1. Above Rs. 1,000/-
2. Between Rs. 750/- & Rs. 999/-
3. Between Rs. 500/- & Rs. 749/-
4. Between Rs. 300/- & Rs. 499/-
5. Between Rs. 101/- & Rs. 299/-
6. Between Rs. 51/- & Rs. 100/-
7. Below Rs. 50/-

**Administration of the Scale**

The scale was administered by strictly following the instructions given in the manual of socioeconomic-status scale (Urban) by B. Kuppuswamy. The specially
devised inventory form was given to the student teachers to be filled up giving the particulars about their parents or guardians. The three aspects of the scale, namely, education, occupation, and income were duly filled by the student teacher.

Scoring

Scoring of the status score of each student teacher was done by duly filling the score card and giving proper weightage to the various items of the score card. The weightage of the scale items is given as under:

Categorisation

After calculating the status score of each student teacher they were further categorised on the basis of the scale given in the manual of the socio-economic-status scale by B. Kuppuswamy. The scale is given under:

The Scale:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>26-29</td>
<td>I High</td>
</tr>
<tr>
<td>16-25</td>
<td>II</td>
</tr>
<tr>
<td>11-15</td>
<td>III</td>
</tr>
<tr>
<td>5-10</td>
<td>IV Low</td>
</tr>
<tr>
<td>Below 4</td>
<td>V</td>
</tr>
</tbody>
</table>
Validity of the Scale

Validity of the scale was tested by matching against outside criterion, distribution pattern and by comparison of dichotomous groups. Means of these scores for each of the three variables were computed for the high as well as the low group. The means and the differences between them are given in the following table:

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>MEAN FOR HIGH GROUP</th>
<th>MEAN FOR LOW GROUP</th>
<th>MEAN DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td>5.27</td>
<td>2.43</td>
<td>2.84</td>
</tr>
<tr>
<td>Education</td>
<td>5.93</td>
<td>2.82</td>
<td>3.11</td>
</tr>
<tr>
<td>Income</td>
<td>4.98</td>
<td>1.84</td>
<td>3.14</td>
</tr>
</tbody>
</table>

3. **Junior Index of Motivation (Jim Scale) Adapted (Form F)**

As one of the objectives of the study was to equate student teachers on the academic motivation level so Junior Index of Motivation (Jim Scale) adapted (Form F) was used to measure the academic motivation level of student teachers. This is a scale which has been prepared by Jack L. Frymier in order to measure
pupil's motivation towards school. This is a paper pencil test. The scale consists of 80 statements which unfold students' motivation towards school, learning and their desire to excel in school subject.

These statements are to be rated on a five point scale i.e.

1. Agree
2. Slightly Agree
3. Indecision
4. Slightly Disagree.
5. Disagree

There is no time limit for the scale but generally students complete it within 30 minutes. The instructions to be followed are given on the top of the scale.

ADMINISTRATION:

In order to obtain reliable information the students were taken into confidence before administering the scale. The instructions were verbally read out to them. The care was taken that students do not consult each other. In order to avoid mutual consultation, the scale was administered to the group
of maximum 30 students at a time. The scale in English. But its adapted form is used by the investigator.

Students were asked to mark (x) at the appropriate place against each statement.

**SCORING**

After collecting the copies of the scale from the students, scoring was done to find out the total scores of each student on the scale. The scoring was done as follows:

+ 2 marks to Agree.
+ 1 marks to slightly agree.
- 1 marks to slightly disagree.
- 2 marks to Disagree.

All the scores were summed up. This is the converted score of Academic Motivation. In order to get the real score, the sign is reverted i.e. If it is plus then it is made minus and vice versa, then hundred is added. This gives the index of Academic Motivation of the students.

Out of the eighty statements in the questionnaire only fifty statements are to be marked they are:
4. BARODA GENERAL TEACHER COMPETENCE SCALE:

As one of the objectives of the study was to measure the effect of microteaching technique in modifying teacher behaviour so observation schedule for general teacher competence prepared at CASE, Baroda was used to get initial test scores and final test scores. This schedule is based mostly on the lists of teaching skills developed at the Stanford University and the Far West Laboratory and the list of teaching skills developed at the CASE (Lalita, 1975). At CASE twenty one skills were conceptualized which are considered to be essential for general teaching competence.

The Baroda General Teaching Competence Scale (BGTC Scale) has been developed and measuring criteria for each of the skills included in it have been provided. This scale has four parts (i) Planning (Pre-instructional) (ii) Presentation (Instructional) (iii) Closing and (iv) Evaluation. In the present study the following three aspects of BGTC scale have been used.
1- Planning
2- Presentation
3- Closing

1) Planning

The planning aspect includes the Pre-instructional planning on the part of the student teacher. It specifies and explains the aims and objectives in context with the content which is being selected by the student teacher. This part brings to light whether the aims and objectives were clearly stated or not; whether they were related to the content which is being taught or not; lastly it explains if the objectives are sufficient with respect to the unit taught and were according to or not the maturity level, time and facilities available. In general this portion explains whether the teacher has planned on the right terms or not. It bring to light why the teacher has selected a particular topic and how she is going to teach that particular topic.

Planning also explains whether the content selected is related to the objectives, maturity
level of the pupils and facilities available or not. Adequacy and accuracy of the content is also judged from this aspect. The organisation of the content is also seen from this part. Whether it is logically organised or not; whether it proceeds from simple to complex or not. Moreover it also explains how many Audio-visual aids were used; were they enough or not and whether they appealed to and interested the students or not. However, the terms used in the planning aspect of BGTC scale are explained below:

1- Objectives of the Lesson:
(a) *Clearly stated:* An objective is said to be clearly stated when it satisfies the following criteria:
(i) there is a verb which describes the learning outcome in the pupils in behavioural terms, (ii) the learner is specified, (iii) the conditions under which the learning outcome is measured are indicated, and (iv) the standard-qualitative/quantitative of achievement is specified.
(b) *Relevant to the content:*
An objective is said to be relevant to the
content when the objective is related to what is being taught.
(c) **Adequate:**

The list of objectives is said to be adequate when it is sufficient with respect to the unit taught, different levels of learning outcomes, the maturity level of the pupils, time and facilities available.

(2) **Content Selected:**

(a) **Relevant:** When content is related to the objectives specified, the maturity level of the pupils, time, and facilities available.

(b) **Adequate:** When content is sufficient to cover all the objectives specified.

(c) **Accurate:** Content is said to be accurate when there is no technical mistake.

3. **Organisation of Content Selected:**

(a) **Logical Continuity:** There is logical continuity in the content when every unit of content to be presented is logically linked with the previous unit.

(b) **Psychological Organisation:** The content is said to be psychologically organised when it is arranged in such a way that pupil's previous knowledge
forms the basis for presenting new knowledge and it proceeds from simpler concepts to difficult concepts.

4. **Audio-Visual Material Chosen:**

(a) **Suitable to pupils:** To their interest and maturity levels.

(b) **Suitable to content:** When they are related to the content, to be presented and makes the presentation of the content more vivid.

(c) **Adequate:** When they are sufficient with respect to the content which they explain.

(d) **Necessary for the attainment of objectives:** When they facilitate attainment of objectives to a greater extent than in their absence.

**PRESENTATION:**

Presentation is the practical aspect of the planning part. It includes the introduction of the lesson, use of questioning, explanation of the content, use of various stimuli, use of silence and non-verbal cues, use of verbal and non-verbal re-inforcers, Pacing of the lesson and Black board work. In general
presentation aspect explains the strength of efforts which were made by the student teacher to achieve the aims that she has put before herself. Further, it also explains the extent to which the student teacher was successful in her efforts. It explains whether the teacher could introduce her topic well and in an adequate way or not. It shows the quality of the questioning of the student teacher and how nicely the problem of no response, partially correct response and completely correct response was handled. This presentation aspect also brings to light how far the teacher was attentive to the responses of the students, whether she maintained meaningful silence or not. It also explains the extent of the use of verbal and non-verbal reinforcers. Lastly, presentation aspect includes the assessment of the Blackboard handwriting of the student teacher if it was adequate, neat, of reasonable size and legible or not. So, presentation aspect is the explanation of the activity of the teacher and how the teacher can maximise the pupil activity in the classroom. This presentation aspect test the ability and capacity of the teacher in making
the presentation of the lesson in the best way.

5- Lesson Introduced:

(a) Ready emotionally: When pupils are attentive and keen to learn the new lesson as indicated by their nonverbal participation like postures, attentive looks towards what the teacher does etc.

(b) Ready from knowledge point of view: Indicated by pupil's verbal participation in terms of correct responses to teacher's question and pupil's meaningful initiation.

(c) Use of previous knowledge: When the already possessed knowledge of pupils is being used.

(d) Continuity in statements or questions: When a teacher's statement or a question is related to the immediately preceding statement or question.

(e) Relevant: When every statement or question uttered by the teacher is related to the objective of the lesson.

(f) Use of appropriate device or technique: When the device or techniques used are suitable to the maturity level, age level, grade level, interest,
culture, experience of pupils, and to the unit to be taught.

6. Questions Put:
(a) **Well structured**: A question is said to be well structured when it is grammatically correct, relevant, specific and concise.
   (i) **Relevant**: When it is related to the topic being discussed and does not contain any technical term not taught earlier.
   (ii) **Specific**: When it calls for a single correct answer.
   (iii) **Concise**: When it is not lengthy and does not contain extra words.
(b) **Properly Put**: A question is said to be properly put when it is uttered with suitable speed and pause (so that it facilitates the understanding of the question) and suitable voice (audible to all pupils, raised and clear)

7. Questions for Probing:
(a) **Prompting question**: A probing question which includes a hint for the pupil that helps him in reaching the expected response, generally asked when there is a
'no response', 'partially correct response', 'incomplete response', or 'wrong response',
(b) **Seeking further information**: A probing question which asks for more information about the response.
(c) **Redirected question**: A probing question directed to more than one pupil for response.
(d) **Refocusing question**: A probing question which seeks pupil to compare the idea or phenomenon in his response with other ideas or phenomena (which he has already learnt). For similarly, contrast, or for any other relationship.
(c) **Increasing critical awareness question**: A probing question which seeks 'how' and 'why' of pupils' response with an intention of increasing critical awareness about the response.
8- **Explanation of concepts and principles**
(a) **Statement to create set**: Those that create readiness in pupils (regarding what is to be explained) emotionally and from knowledge point of view.
(b) **Concluding Statements**: They are summary statements covering the main points in the explanation.
c) **Relevant Statements:** Those that are related and contribute to what is being explained.

d) **Statements that have continuity:** Statements that are linked logically with the previous ones and having spatial and time sequence.

e) **Appropriate Vocabulary:** Technical terms appropriate to the particular class, age group, and known to majority of pupils.

f) **Explaining links:** Words and phrases (mostly conjunctions and prepositions) which indicate that the teacher is explaining.

g) **Fluent statements:** Those that are complete and not reformulated in the middle.

9- **Illustration of concepts and Principles:**

a) **Appropriate examples:** Those that are simple, relevant and interesting.

i) **Simple example:** One that involves previous knowledge of pupils which can be judged from their participation.

ii) **Relevant example:** One that exemplifies the concept or principle being illustrated.
iii) **Interesting examples:** One that can arouse curiosity and interest in pupils which can be judged from their attending behaviour.

b) **Appropriate media (Verbal and non-verbal):**

Refers to those that are suited to age, grade, and maturity levels, and to the unit taught.

10. **Securing and sustaining Attention by Varying Stimuli:**

a) **Movements:** Those movements that are deliberately made from one place to another, in order to secure pupils' attention.

b) **Gestures:** Include movements of head, hand and body to direct attention, to indicate shapes, sizes, movements etc.

c) **Change in speech pattern:** Include sudden change in tone, volume or speed of teacher's speech.

d) **Focusing:** Include verbal, gestural or verbal-gestural focusing (drawing pupils' attention to specific aspects in the lesson).

e) **Change in Interaction Style:** Include change from one type of interaction style to another-teacher-group, teacher-pupil, and pupil-pupil.
f) **Pausing:** Involves deliberate silence in order to draw pupils' attention.

g) **Oral-visual switching:** Includes change from one medium to another - oral, visual, and oral-visual - through which information is conveyed to the pupils.

11. **Use of deliberate Silence and Non-Verbal Cues:**

a) **Silence:** Includes meaningful silence meant to stimulate pupils to think, for considering pupil's question, after a pupil's response indicating him to continue etc.

b) **Non-verbal cues include the following:**

   i) **Facial cues:** A smile, a frown, looking thoughtfully at the pupil, and a quizzical look.

   ii) **Head movement:** Nodding, shaking, tilting of head etc.

   iii) **Body movement:** Movement from one place to another.

   iv) **Hand movement:** Pointing to the student, continue cue, 'anything else?' Cue, stop cue, pointing from one student to another etc.

12. **Use of Verbal and Nonverbal Reinforcement:**

a) **Verbal reinforcement:** Include expressions like good,
excellent, come on, think, um-um etc., and also repetition and rephrasing of pupil's response which reinforce the pupil's behaviour positively and encourage him to participate.

b) Nonverbal reinforces: Include nonverbal behaviours like nodding, smiling, moving towards responding pupils, looking attentively at the responding pupil, writing pupil's response on the blackboard which reinforce or strengthen pupil's behaviour and encourage him to participate.

13. Pacing of the lesson: Speed of presentation matching with the rate of pupils' understanding: when before proceeding from one unit to the other, pupils' understanding about the earlier unit is brought out.

14. Blackboard Work:

a) Legibility in handwriting includes the following:

i) Every letter is distinctly different from the other.

ii) There is adequate spacing between two letters and between two words.

iii) Slantiness of each letter is closest to the vertical.
iv) Size of each letter is large enough to be read from the far end of the room.

v) All capital letters are of the same size and all small letters are of the same size.

vi) Thickness of the lines is of same width.

b) Neatness in blackboard work includes the following:

i) Words and sentences written are parallel to the base of the board.

ii) Spacing between lines in adequate.

iii) There is no overwriting.

iv) Only the relevant matter which is under the focus of classroom discussion is retained on the blackboard.

c) Appropriateness of written work on the blackboard includes the following:

i) There is continuity in the points being presented on the blackboard.

ii) The points written are brief and simple.

iii) Important points are underlined to draw pupils' attention.
iv) Coloured chalks are used suitably.

v) Diagrams are proportional in size.

vi) Diagrams/illustrations are developed along with the lesson.

vii) There are no unnecessary details in the diagrams/illustrations.

3. Closing:

The closing aspect includes the way student teacher assessed the comprehension of the students whether the present knowledge was linked to the previous knowledge or not and if home work was given according to the individual differences of the students or not. So, closing aspect explains how efficiently the student teacher ended her lesson. The closing aspect brings to light what were the situations in which the student teacher tested the comprehension of the students and how far the assignment given was relevant and adequate to the content taught. So, this is the aspect which justifies whether the content was presented adequately or not. It is a criteria which finally justifies the ability
of the student teacher. However, the terms used in the closing aspect of BGTC scale are explained below:

15- Assignment:
a) Suited to weak students (simple, recall) or recognition type items), certain are suited to average (more than recall and requires understanding), and others are suited to above average students (challenging requires creative, original and higher order thinking)
b) Relevant: Related to the content being taught.
c) Adequate: Sufficient with respect to the content covered and to the checking of the objectives specified.

5- Observation Schedule for the skill of probing questioning:

As the development of the skill of probing questioning is one of the objectives in the study, so for observing and measuring this skill, the observation schedule prepared by Pass and Others was used.

This observation schedule for the skill of probing questioning has the following two aspects.
a) Schedule for marking tallies for each of the probing question in appropriate cells as they occur during the lesson

b) To ascertain the extent to which the student teacher uses the skill of probing questioning. The observation schedule for the skill of probing questioning is given in the appendix but the details of the two aspects of the observation schedule are given as under:

a) **Schedule for marking tallies.**

This Schedule has four parts:

1) The first part records the bio-data about the student teacher who is to be tested on this schedule:

i) Name of the student teacher.

ii) Roll No.

iii) Topic

iv) Name of the supervisor.

v) Date

vi) Time duration

vii) Teach/re-teach.
2- The second part explains the meaning of the components which constitute the skill of probing questioning so that the investigator can mark the tallies correctly without confusing the different components.

i) Prompting questions.

ii) Seeking further information questions

iii) Refocusing questions.

iv) Re-directed questions

v) Increasing critical awareness questions.

3- The third part explains in very precise terms the method and instructions to mark tallies for each of the probing question that occurs during the lesson.

4- The last part has two portions. On left hand are given the names of the components in a serial order. On the right side are given the cells opposite each component to mark tallies. The investigator marks one tally when any of these components is used by the student teacher who is observed on this schedule. The investigator marks tallies for six minutes.
b) The second aspect of the observation schedule for the skill of probing questioning records the extent to which the skill of probing questioning was used by the student teacher.

This aspect has three parts:

1- The first part records the bio-data of the student teacher whose lesson has been recorded on the first schedule for marking tallies.
   i) Name of the student teacher.
   ii) Roll No.
   iii) Topic
   iv) Class
   v) Name of the supervisor.
   vi) Date
   vii) Time Duration.
   viii) Teach/Reteach

2- The second part includes the instructions for marking the extent to which the student teacher uses the skill of probing questioning. Judgements are to be given on a six point scale for various components of the skill. The extent of use is indicated by crossing the number which is considered to be fixed by the
investigator. The scale value '0' indicates that the particular aspect or aspects of the skill was not used at all. The scale value '6' means that the student teacher used the skill aspect or aspects very much so keeping these two extremes in view the behaviour of the teacher is indicated by crossing the right scale value.

3- The third part has again two portions. On left side the five components of the skill of probing questioning are given in a serial order. On the right side is given the six point scale on which the extent of the use of the particular component is to be indicated by crossing (x) the appropriate scale value. So these two aspects of the observation schedule for the skill of probing questioning, when combined give the total picture of the extent of the use of the skill or probing questioning by the student teacher.

6- Observation Schedule for the skill of stimulus Variations:

As the development of the skill of stimulus variation is one of the objectives in the study,
so for observing and measuring this skill, the observation schedule prepared by Passi and others was used.

This observation schedule for the skill of stimulus variation has the following two aspects.

a) Schedule for marking tallies for each of the stimulus variation in appropriate cells as they occur during the lesson.

b) To ascertain the extent to which the student teacher uses the skill of stimulus variation. The observation schedule for the skill of stimulus variation is given in the appendix but the details of the two aspects of the observation schedule are given as under:

a) Schedule for marking tallies:

This schedule has four parts:

1- The first part records the bio-data about the student teacher who is to be tested on this schedule:

i) Name of the student teacher

ii) Roll No.

iii) Topic

iv) Class

v) Name of the Supervisor
1. Date
2. Time
3. Teach/Reteach

2- The second part explains the meaning of the components which constitute the skill of stimulus variation so that the investigator can mark the tallies correctly without confusing the different components.

i) Movements
ii) Gestures

iii) Change in speech pattern.
iv) Focusing

v) Change in interaction styles.
vi) Pausing.

vii) Oral-visual switching
     i) Oral  = Visual
     ii) Oral  = Oral-Visual
     iii) Visual = Oral-Visual

3- The third part explains in very precise terms the method and instructions to mark tallies for each of the stimulus variation that occurs during the lesson.

4- The last part has two portions. On left hand
are given the names of the components in a serial order. On the right side are given the cells opposite each component to mark tallies. The investigator marks one tally when any of these components is used by the student teacher who is observed on this schedule. The investigator marks tallies for six minutes.

b) The second aspect of the observation schedule for the skill of stimulus variation records the extent to which the skill of stimulus variation was used by the student teacher:

This aspect has three parts:

1- The first part records the bio-data of the student teacher whose lesson has been recorded on the first schedule for marking tallies.

i) Name of the student teacher

ii) Roll No.

iii) Topic

iv) Class

v) Name of the Supervisor

vi) Date

vii) Time Duration

viii) Teach/Retech.
2- The second part includes the instructions for marking the extent to which the student teacher uses the skill of stimulus variation. Judgements are to be given on a six point scale for various components of the skill. The extent of use is indicated by crossing the number which is considered to be fixed by the investigator. The scale value '0' indicates that the particular aspects or aspects of the skill was not used at all. The scale value '6' means that the student teacher used the skill aspect or aspects very much so keeping these two extremes in view the investigator records the extent of the use of this skill of stimulus variation.

3- The third part has again two portions. On left side the seven components of the skill of stimulus variation are given in a serial order. On right side is given the six point scale on which the extent of the use of the different components of the skill of stimulus variations was thought to be fit by the investigator.

So these two schedules when combined together give the total picture of the use of the skill of stimulus variation by the student teacher.

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7- OBSERVATION SCHEDULE FOR THE SKILL OF EXPLAINING:

This observation schedule was used by the investigator to measure the use of the skill of explaining by the students teachers. This observation schedule is also the part of the thirteen hand books which are prepare at CASE, Baroda for measuring the thirteen skills for increasing teaching competency of the student teachers.

This observation schedule for the skill of Explaining has two parts:

a) For marking tallies (b) For ascertaining the extent of the use of skill of Explaining.

a) FOR MARKING TALLIES:

This first part of the observation schedule has further four parts. The first part records the bio-data of the individual who is to be observed on namely, this schedule, the name of the student, Roll No, topic to be taught, Date, Time etc.

The second part includes the explanation of the different components of the skill of explaining. The key terms used in the schedule are explained in this section e.g. this portion defines and explains what are explaining links, beginning statement(s)
concluding statement(s), inappropriate vocabulary etc.

The third part of the schedule explains the instructions for marking tallies. It explains the procedure for marking tallies. Tallies are to be marked for each desirable or undesirable behaviour. The questions which are followed by correct response, they are to be tick (✓) marked.

The fourth part of the observation schedule has further two parts in which tallies are to be marked (i) Desirable behaviour (ii) Undesirable behaviour. On the left side of these two parts are given the components of the desirable and undesirable behaviour. On the right side are the calls against each component to mark tallies for the occurrence of each desirable and undesirable behaviour. One tally stands for the occurrence of behaviour once.

So, this observation schedule records the behaviour of the student teacher when the skill is in the process of being used.

b) FOR ASCERTAINING THE EXTENT OF THE USE OF SKILL

This observation schedule is used after the use of the observation schedule for marking tallies.
Once the tallies are marked the investigator uses this observation schedule to ascertain the extent of the use of the skill of explaining. The observation schedule has three parts.

The first part records the bio-data of the student teacher whose behaviour is already observed on the first observation schedule. This bio-data is recorded again so that the two observation schedules do not get mixed up. This part includes the name of the student, Roll No., topic taught, Time, Date etc.

The second part explains the instructions for ascertaining the extent of the use of the skill of explaining. Judgements are to be given on a six point scale for various aspects of the skill. The extent is indicated by crossing (x) the number, the investigator deems fit. The scale value '0' indicates that the student teacher did not use the concerned aspect(s) at all. The scale value '6' indicates that the student teacher used the particular aspect(s) very much. Keeping these two extremes in view, the investigators marks the teacher behaviour related to
the various given aspects of the skill by crossing (X) the right number in the scale value ranging from zero to six.

The third of the schedule again has two portions. On left side are given the various components of the skill of explaining in a serial order. On right side against each component is given the scale on which the extent of the use of the skill of explaining is to be marked between the scale values of '0' to '6'.

When these two observations schedules are combined together they give the extent of the use of the skill of explaining by the student teacher.

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**OBSERVATION SCHEDULE FOR THE SKILL OF ILLUSTRATING WITH EXAMPLES:**

The skill of Illustrating with examples is necessary in a teacher because it helps in bringing clarity, simplicity and interest in teaching. Keeping this in view the observation schedule for the skill of Illustrating with examples was developed at CASE, Baroda for measuring the
teacher behaviour with regard to the use of the skill of Illustrating with examples.

The observation schedule for the skill of Illustrating with examples has two parts:

A) For marking tallies. (B) For ascertaining the extent of the use of the skill of illustrating with examples.

A) FOR MARKING TALLIES:

This part of the observation schedule has further four parts. The first part records the bio-data of the student teacher whose behaviour is to be observed on this observation schedule with regard to the use of the components of the skill of Illustrating with examples. It records the name of the student teacher, Roll No. Topic to be taught, date, time etc.

The second part explains the terms used in the observation schedule, so that the investigator can clearly and distinctly mark the tallies without confusing one aspect of behaviour from the other. It explains the concept of simple examples, relevant examples, interesting examples, inductive-deductive
approach etc. These explanations provide guidelines for marking tallies in the fourth part of the observation schedule.

In the third part are given the instructions for marking tallies. The investigator is to tick(✓) against each example whether it is simple, relevant, interesting, presented through appropriate media, and whether it encouraged pupil participation or not. In the column of 'Approach' the investigator is to write 'I' (inductive) if the example was used for arriving at a concept and 'D' (Deductive) if the example was to verify the pupil's understanding. 'R' is also to be written in the same column for indicating the place where the concept or rule arrived.

The fourth part includes the eight portions where the use of the examples is to be tick (✓) marked. The eight parts are (i) Sr.No.Example (ii) Simple (iii) Relevant to rule or concept (iv) Interesting (v) Medium/Media appropriate (vi) Approach (vii) Pupil participation (viii) Remarks. These eight parts of the fourth part are duly filled by the
investigator as the pupil teacher uses the skill of illustrating with examples.

So, this observation schedule is used by the investigator, when the teacher is actually making use of the skill of illustrating with examples.

B) TO ASCERTAIN THE EXTENT OF THE USE OF THE SKILL:

This observation schedule is used when the investigator has duly filled the previous observation schedule for marking tallies. This schedule is used by the investigator to ascertain the extent of the use of the skill of illustrating with examples.

This observation schedule has three parts. The first part includes the bio-data of the student teacher who is already observed and marked by the investigator on the observation schedule for marking tallies. This bio-data of the student teacher is recorded again to avoid confusion. This part records again the name and roll No. of the student teacher, topic to be taught, Date, Time etc.

The second part of this observation schedule explains the instructions for ascertaining the extent
to which the student teacher used the skill of illustrating with examples judgements have to be given on a six point scale. The extent of the use of the various components of the skill is indicated by crossing (x) the number the investigator deems to be fit. The scale value '0' indicates that the student teacher did not use the component(s) at all. The scale value '6' indicates that the student teacher used the component(s) very much. Keeping these two extremes in view the investigator indicates the use of the skill by crossing the right scale values from zero to six.

The third part of this observation schedule is further divided into two portions. On left side are given the various components of the skill of explaining in a serial order. On right side is giving the scale value ranging from '0' to 'six' against each component. By crossing (x) the appropriate number the investigator indicates the extent of the use of the skill of explaining by the student teacher.
When these two observation schedules A and B are combined they give the complete picture of the use of the skill of explaining by the student teacher.

9) **OBSERVATION SCHEDULE FOR THE SKILL OF RE-INFORCEMENT**

   The pupils need social approval when they are answering or responding in the class, they want to know whether the teacher approves their answer or not. The teacher can approve and disapprove the answers of students in many ways. To measure this skill, the observation schedule for the skill of Re-inforcement was developed at CASE, Baroda.

   This observation schedule for the skill of Re-inforcement has two parts (a) For marking tallies, (b) Ascertains the extent of the use of the skill.

A) **FOR MARKING TALLIES:**

   This part of observation schedule for the skill of Re-inforcement has further four parts. The first part records the bio-data of the student-teacher who is to be observed by the investigator on this observation schedule. This records the name and
Roll No. of the student teacher, topic to be taught, Date, Time etc.

The second part of this schedule explains the key terms which are used in this observation schedule e.g. positive verbal reinforcement, positive non-verbal re-inforcement, negative verbal reinforcement, wrong use of reinforcement, inappropriate use of reinforcement etc. These explanations of the key terms help and guide the investigator to mark the teacher behaviour correctly against appropriate component.

The third part includes the instructions for the person who is to make use of this observation schedule for the skill of reinforcement. The investigator is to mark tallies in the appropriate cells for the occurrence of different components of the skill of reinforcement. One tally means the occurrence of that component once.

The fourth part is further divided into two parts. On left side are given the various components of the skill of reinforcement in serial order. On right side
are given the cells against each component where the investigator marks tallies as the various components of the skill of reinforcement occur during the lesson.

So, this observation schedule is used when the teacher is actually making use of the skill of reinforcement.

B) TO ASCERTAIN THE EXTENT OF THE USE OF THE SKILL.

This observation schedule is used when the investigator has already observed the student teacher on the observation schedule for marking tallies (A). This observation schedule is used to ascertain the extent of the use of the skill of Reinforcement on the basis of the tallies that the student teacher has already got on the observation schedule for marking tallies.

This observation schedule has three parts. The first part records the bio-data of the same student teacher who is already observed on the observation schedule for marking tallies e.g. the name and Roll No of the student teacher, topic to be taught, time, date etc. This bio-data is recorded again to avoid confusion.
The second part of this observation schedule explains the instructions for the use of this schedule. Judgements have to be given on a six point scale for various aspects of the skill. The extent of the use of the skill is to be indicated by crossing (X) the numbers deemed to be fit by the investigator. The scale value '0' indicates that the student teacher did not make use of the component(s) at all. The scale value '6' indicates that the candidate made use of the component(s) very much. Keeping these two extremes in view the investigator or supervisor indicates the extent of the use of the skill by crossing (X) appropriate numbers between the scale of '0' to '6'.

The third part of the schedule is further divided into two parts. On left side are given the various components of the skill of reinforcement in serial order. On right side is given the six point scale against each component on which the supervisor indicates the extent of the various components of the skill of reinforcement.

These two observation schedules combined give the total picture of the use of the skill of reinforcement by the candidate or student teacher.
Jumbled mass of raw data is confusing and difficult for the eye and mind to grasp, one must decide how to organise, reduce and summarise the data into a meaningful form.

3.6 To give statistical treatment and proper shape to the data collected the following statistical treatments will be given:

1- For the purpose of making interpretable comparisons among the different cycles of Microteaching in each skill between the scores on BGTC scale at pre-test stage, orientation lesson stage, post-test stage, the scores on different observation schedules for different skills and also for getting a sharp perception of the data in a compact form, mean and S.D. will be calculated.

2- Correlation will be calculated to determine the relationship between the scores of different stages and among different skills.

3- Stanine scale will be used to classify raw scores into 'high', 'average' and 'low' categories against a standard norm.
4- Difference between the two means will be calculated to determine the effect of microteaching at various stages of training.

5- Analysis of covariance will be used to determine the overall effect of microteaching on the group as a whole, within groups and between groups. Part of the data were got computerized for this purpose.

3.6 CONCLUSION:

The research design, instrumentation, methods and procedure were treated in this chapter. The research design will be of experimental type. The sample would include 32 student student teachers who would be given training in microteaching technique. Data gathering techniques would include tests, questionnaire B.G.T.C. scale, observation schedules for different skills etc.

Having described the research design, the methods and the procedure, the collection, analysis and interpretation of data will now be presented in the chapter that follows.

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