CHAPTER II

METHOD AND PROCEDURES

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2.0. INTRODUCTION :

It is difficult to assess the teacher effectiveness because of inconsistency and unstable criterion to be measured and non-availability of a standardised tool for this measurement. The acquisition of instructional skills is the essential objective of microteaching. As the teaching skills are important ingredients of teaching competence and also of teacher effectiveness, consistent and stable criteria based on teaching skills have been selected. So the microteaching is a partial answer to the question of teacher effectiveness about 'what to measure' and 'how to measure' the various criteria pertaining to teacher behaviour during teaching-learning processes. This study investigates questions relating to teacher effectiveness : the modification of teacher behaviour through acquisition of skills under various feedback treatments in microteaching, the effect of microteaching on attitude development, and the effect of microteaching on its feasibility with in-service teachers. More specifically, the objectives of this study were :

1. To study the effectiveness of Microteaching under various feedback treatments compared with integrated skill-based traditional practice teaching on the development of general teaching competence.

2. To study the relative effectiveness of various feedback treatments (self-analysis through audiotape, supervisory

feedback, and supervisory-cum-audiotape feedback) in microteaching situations on the development of general teaching competence.

3. To study the effect of training through microteaching in specific teaching skills on the ability to use these skills in macrolessons.

4. To study the change in teachers' attitudes towards teaching after acquisition of teaching skills through microteaching.

2.1. DESIGN OF THE STUDY :

This project under in-service teachers' training programme was an experimental research study. The study was undertaken for verifying the comparability among the treatment groups of microteaching and integrated skill-based traditional practice teaching; the relative effectiveness of various feedback treatments on acquisition of the teaching skills through microteaching and skill-based traditional practices on the development of general teaching competence; and also in verifying the comparability within the treatment groups on certain measures on general teaching competence before and after the experimental treatments. So, a design of pre- and post exposure in experimentation was necessary for this study. Fox (1969) stated that the pretest, post test design with one control group remains the single most popular experimental design in education. In experimentation as per the view of Good (1963) the investigator controlled (manipulated or changed) certain

independent variables and observed the changes which took place in the dependent variables. From considering the importance and need, and to fulfil the objectives cited, an experimental pretest - post test parallel group design was undertaken in testing the hypotheses.

2.1.1. Experimental Treatment :

This experiment involved the evaluation of some new and untried elements or conditions - various feedback treatments during acquisition of teaching skills, practices through micro-teaching, acquisition of specific five teaching skills which were referred to as the independent variables; while the criteria by which these above variables were evaluated, or any subsequent effect that was caused by the above variables were the dependent variables. The basic referents for identification of the dependent variables were original research problem and the hypotheses the researcher wished to test. These were:effect on the development of general teaching competence, effect on the summated values of the specific skills of general teaching competence, the change in teachers' attitudes towards teaching, and the ability to use specific skills on macrolesson through some criterion measures. The cause and effect relationships were established by the above two variables during the experimentation. Fox in his statement said "Ideally, an experiment is so designed that there is a direct relationship between the independent and dependent variables - direct in the sense that it is reasonable to believe

that whatever differences exist on the dependent variables after the experiment can be attributed to the independent variable".

Three feedback treatments having : (i) Self-Analysis through Audiotape feedback; (ii) Supervisory feedback; and (iii) Supervisory-cum-Audiotape feedback on the acquisition of teaching skills through microteaching were the experimental variables, whereas traditional practice teaching for the acquisition of those skills in an integrated approach under conventional supervision was a control variable having some 'filler' tasks (i.e. emphasising the practices in teaching skills) during experimentation. These four feedback treatments were the independent variables. The effect on the development of general teaching competence measured through the Baroda General Teaching Competence (BGTC) Schedule (vide the caption 'tools used', and in appendix-A); the ability to use the specific five skills in an integrated manner in macrolessons measured through the same Schedule but taking the criterion indicating the specific measures on the summated scores of the five skills only; effect of acquisition of teaching skills on the change in teachers' attitudes measured through the Ahluwalia Teachers' Attitude Inventory (ATAI) (vide the caption 'tools used' and appendix-B); and teachers' reactions towards microteaching, evaluated through 'Self-Evaluation Proforma' (vide the caption 'tools used' and appendix-C) were the dependent variables.

Considering the above independent variables, three experimental groups having 'E_1' for Self-analysis through audiotape,

'E_2' for Supervisory feedback and 'E_3' for Supervisory-cum-audiotape feedback were taken in microteaching approach where as on control group 'F' named as 'Filler Group' having acquisition of such skills with supervisory approach in traditional practice teaching existed during experimentation.

2.1.2. The Significance of 'Filler' Group :

From the reports of Roethlisberger and Deckson (1940), a series of studies were carried out at the Hawthorne Plant of Western Electric Company involving human subjects in experiments. Those studies revealed that if the individual was aware of his participation in an experiment his knowledge of participation itself altered his performance and invalidated the experiment. Subsequently, a number of psychologists, as reported by Borg (1963), and Fox (1969) found, as the experimentation was exciting and intriguing, the subjects under treatment groups after knowing the fact or information that they were under experiments, were excited and motivated to improve their performances. Studies involving methods, reported by Borg (1963), for example, in which one group of teachers continued with same teaching method they had previously employed while another group was trained in a new method and received considerable help and attention, showed that in implementing this new method, the attention usually resulted in changes in teacher performance or pupil achievement (if any) favourable to this methods. The results of such experiments were almost certainly influenced by an aspect of bias named as 'Hawthorne Effect'. The teachers became more

psychologically prone to increase their efficiency in displaying the new teaching technique in the classroom performances with more interest and motivation, being aware of the fact that they were under the process of experimentation. The influence of this effect was expected to decrease the novelty of the new approach. To avoid or minimise this effect parallel treatment was adopted in both the groups of experimental and control so that the teachers in each group were likely to display equal interest and motivation during the practice either through microteaching or traditional approaches and even in classroom performances. Moreover, Borg (1963) stated categorically that the research worker should maintain as much similarity between the treatment of experimental and control groups as possible.

The 'filler group' represented a control group having a 'filler' task to avoid or reduce the Hawthorne Effect. The teachers in this group received the same treatment equivalent to other experimental groups 'E_1', 'E_2' and 'E_3' in orientation and modelling of teaching skills prior to microteaching practices. But instead of microteaching, the teachers in 'filler' group practiced those teaching skills in traditional practice teaching. The detailed procedure is given in subsequent captions. This 'filler' group 'F' was not absolutely a control one in respect of the same old technique adopted in teachers' training institutions. The orientation of teaching skills; demonstrations of those skills in microlessons; supplying the literatures of each skills; guiding in planning a lesson for normal classroom situation emphasising the teaching skills in an integrated manner before

practices; and discussion of those skills used, further improvement and other guide lines on this specific skill development during supervisory session after the observation of traditional practices were the essential aspects or 'filler' tasks for 'filler' group treatment.

Another aspect of bias was also eliminated on this 'filler' tasks to the 'F' group. The investigator used the Baroda General Teaching Competence (BGTC) Schedule in all the treatment groups (E_1, E_2, E_3, and F) for measuring the overall accomplishment of twenty one teaching skills for general teaching competence. This Schedule was the only one tool in this respect so far developed and widely accepted in Indian context. The BGTC Schedule which was standardised within microteaching setting emphasising the teaching skills only, was a measuring device for all the four groups during experimentation. For maximising the comparable content validity during assessment of classroom teaching through the BGTC Schedule, a control group either no treatment or having traditional approach without the practice of teaching skills was not taken in this study. On this aspect Fox (1969) hinted, "In an experiment, innovation exists. Something new being tried out and compared to something old. How then do we measure comparative accomplishment ?" He further suggested that to evaluate the comparative accomplishment of new and innovative measures with that of traditional, the data gathering instrument should be so selected or constructed that it will have comparable content validity for both experimental and control research situations. But it was then very difficult to find or

develop such an instrument accomplishing both the measures. Due to non-availability of such a measuring device the investigator was forced to adopt an adjusted group - 'Filler Group' where equivalent measures during treatments were introduced to cope with the measures of available device i.e. BGTC Schedule.

Hence to avoid or minimise the Hawthrone effect from the experimentation and to reduce the sources of bias from the measuring device employed, the 'F' group having 'filler' task was taken. This 'filler' group was equivalent in all respects with that of experimental groups before practice, in orientation and modelling; during practice having traditional practice teaching emphasising the teaching skills in an integrated approach; and after practice during post test and retention test. Moreover, the importance of the following statement given by Lehmann and Mehrens (1971) influenced the researcher in taking a comparable control group but not a group that receives no treatment. In their own statement they hinted, "In experimental studies where a 'true' control group is used, both groups are treated identically except for the fact that the control group is not exposed to the treatment under study. In any experiment, it is essential that we make comparison between two or more groups that are basically similar or comparable". However, it was recognised that the control group, as previously defined (a group that receives no treatment), was not an essential ingredient in this experimental method.

2.1.3. Sample :

In most research instances in social sciences, it is not possible to collect data from every respondent relevant to the study but only from some fractional part of all the respondents. The process of selecting the fractional part is called sampling. Various techniques have been devised for obtaining a sample which will be representative or a selected fractional part of its population. The adequacy of a sample will depend upon the knowledge of the population as well as the procedures used in drawing the sample. Borg (1963) stated that the most important factor in determining the generalizability of research results is the selection of the sample used in collecting the research data. As this study envisaged to test the feasibility of microteaching and teaching skills on secondary school in-service teachers, the population i.e. the in-service teachers from which the sample, drawn was pre-fixed and the selection was deliberate before proceeding to the experimentation. Before selecting the final matched samples in each group of experimental and 'filler', a general concept into three stages was used as : (i) the invited sample, (ii) the accepting sample and (iii) the data producing sample. Before going to these stages the population of in-service teachers was clearly defined.

Population : This study was undertaken only in in-service setting having secondary school teachers of Orissa as the population. The following parameters in selecting this population were considered before inviting them for acceptance to participate, as the subjects

during this experimentation. The parameters were :

(i) the teachers of secondary schools having classes VIII to XI (not in 10+2 pattern) of Orissa State, particularly from Cuttack and Puri Educational Districts,

(ii) the schools, having atleast four male trained graduate/ post graduate teachers to adopt all the four feedback treatments simultaneously,

(iii) schools, under private management only for homogeneity of the sample, and

(iv) schools, easily accessible and

(v) schools from which necessary cooperation for conducting the project, was available.

Invited Sample : With this broad frame of parameters in selecting the in-service teachers, the investigator invited such teachers from thirty four high schools from two educational districts, i.e. Cuttack I Circle and Puri Circle, to participate in this experimental study. A detailed information about the name of the teacher, sex, age, qualification both professional and non-professional, teaching experience in years, and the major subjects taught in top three classes (in class IX, X, XI) was collected from each of those schools for each teacher for homogeneous matching.

Accepting Sample : Out of thirty four invited samples of high schools, twenty six responded accepting for the participation

during the experimental study. From the required informations collected from the schools and the individual teachers it was found that seventeen schools had four or more trained graduate/ post graduate teachers in each, six schools had three trained graduate/postgraduate in each, and three schools had only two and even less than two trained graduate teachers. The last three high schools were outright rejected considering the above parameters.

Data Gathering Sample : On the basis of the certain relevant criteria, the subjects of in-service teachers were matched to reduce the initial differences between the experimental and filler groups on the dependent variables. This reduced type S errors associated with sampling of research subjects, as pointed by Borg (1963). He also stated that maching was most useful in studies where small samples were to be used and when large differences between an experimental and control group on the dependent variable were not likely to occur. Considering the points discussed above for having a homogeneous grouping, the following criteria were selected : age of the teacher by 1st December, 1976; teaching experience till that date, qualification, major subjects taught in higher classes and sex of the teacher. Out of the twenty three schools only nine schools were retained having four teachers in each school for acquiring teaching skills through different feedback treatments taking atleast one treatment by each teacher. However, a final selection was

completed taking a closer matched mean and standard deviation of their age and experience, and other criterion variables of qualification and teaching subjects. The experimenter adjusted the subjects from one group to another in order to obtain a closer match of mean and S.D. in age and experience. Finally nine male teachers were retained in each group : 'E_1' having Self-analysis through audio tape, 'E_2' having supervisory feedback, and 'F' having 'filler' task with traditional supervisory practices; but there were six male teachers in the group of 'E_3' having Supervisory-cum-audio tape feedback.

The following paragraphs are discussed about the distribution of teachers in the four groups 'E_1' (n=9), 'E_2' (n=9), 'E_3' (n=6) and 'F' (n=9) according to age, experience, qualification and teaching subject. Lastly, the name of the schools with their code number is shown in tabular form.

Age-wise Distribution of Teachers : This was one of the criterion variables taken for distribution of thrity three teachers among 'E_1' , 'E_2', 'E_3', and 'F' groups using matching of their mean and S.D. The Table 2.1 shows the distribution, and S.D. of the age of the four groups. The mean and S.D. are : 'E_1' (n=9) - Mean age, 31.60, and S.D., 3.16; 'E_2' (n=9) - Mean age, 31.20, and S.D., 3.15; 'E_3' (n=6) - Mean age, 31.29 and S.D., 3.80, and 'F' (n=9) - Mean age, 31.60, and S.D., 3.52 . It is seen that the four groups are well matched in age.

TABLE : 2.1. : Age-wise Distribution of Teachers under 'E_1', 'E_2', 'E_3' and 'F' groups.

Class Intervals on Age.	E_1 (n=9) No.of Teachers	E_2 (n=9) No.of Teachers	E_3 (n=6) No.of Teachers	F (n=9) No.of Teachers
20-24	-	-	1	-
25-29	3	3	1	3
30-34	3	4	2	3
35-39	3	2	2	3
Total No. of teachers	9	9	6	9
Mean Age in Years	31.60	31.20	31.20	31.60
Standard Deviation	3.16	3.15	3.80	3.52

Teaching Experience-wise Distribution of Teachers : The Table 2.2 refers the teaching experience-wise distribution where it is seen that the mean experience and the standard deviation in each groups of 'E_1', 'E_2', 'E_3' and 'F' are nearly equal in all respects. The range in teaching experience varies from three years to fourteen years. The mean experience and S.D. of 'E_1', 'E_2', 'E_3' and 'F' groups of teachers are nearly equal of having 7.70, 2.89; 7.60, 2.87; 7.70, 3.10; and 7.70, 3.06 respectively.

TABLE : 2.2. : Teaching Experience-wise Distribution of Teachers under 'E_1', 'E_2', 'E_3' and 'F' Groups.

Class Intervals on Experience in Years.	E_1 (n=9) No.of Teachers.	E_2 (n = 9) No.of Teachers.	E_3 (n=6) No.of Teachers.	F (n= 9) No.of Teachers.
1-4	2	1	1	3
5-9	5	5	3	3
10-14	2	3	2	3
TOTAL	9	9	6	9
Mean Experience in Years.	7.70	7.60	7.70	7.70
Standard Deviation.	2.89	2.87	3.10	3.06

Educational Qualification and Teaching Subject-wise Distribution of Teachers : Table 2.3 presents the number of science and arts trained personnels among the trained graduate and post graduate teachers as well the teaching subjects of groups as a whole. In each group of 'E_1', 'E_2' and 'F' there were seven trained graduates and two post graduate teachers and in 'E_3' group five trained graduates and one post graduate teacher. Out of thirty three teachers twelve science trained graduates; fourteen arts trained graduates; six trained in arts post graduates and one trained in science post graduate teachers were taken for this project.

TABLE : 2.3 : Educational Qualification and Teaching Subject-wise Distribution of Teachers under groups 'E_1', 'E_2', 'E_3' and 'F'.

Treatment groups	Trained Graduate Teacher (TGT)			Trained Post-graduate teacher (PGT)			No. of Teachers in total in each group	Teaching Subjects
	Science	Arts	Total No. of teachers	Science	Arts	Total No. of teachers		
E_1	4	3	7	-	2	2	9	English, Oriya, Mathematics, Science, History and Geography.
E_2	4	3	7	1	1	2	9	-do-
E_3	2	3	5	-	1	1	6	-do-
F	2	5	7	-	2	2	9	-do-
TOTAL	12	14	26	1	6	7	33	

TABLE : 2.4 : The Schools with their code numbers and the number of Teachers under various feedback treatments of 'E_1', 'E_2', 'E_3' and 'F' groups.

Institution Code.	Name of the Institution	'E_1'(n=9) 'No. of 'Teachers	'E_2'(n=9) 'No. of 'Teachers	'E_3'(n=6) No. of Teachers	'F'(n=9) No. of Teachers	Total No. of Teachers.
I_1	Maharatha Bidyapith, Nahar Kanta.	1	1	-	1	3
I_2	Balianta High School.	1	1	1	1	4
I_3	A.H.Bidyapith, Uttamapur.	1	1	1	1	4
I_4	B.J.High School, Brahman-Jharilo.	1	1	-	1	3
I_5	S.A.High School, Gandarpur.	1	1	1	1	4
I_6	U.U.Bidyapith, Kendupatna.	1	1	1	1	4
I_7	Sailo-Jharpara High School.	1	1	1	1	4
I_8	S.G.High School, Bilasuni.	1	1	1	1	4
I_9	Rameswar Bidyapith, Jallarpur.	1	1	-	1	3
TOTAL:	(Nine Schools)	9	9	6	9	33

The names of the schools with their code number, as well as the number of teachers in different groups included in the study are given in the Table 2.4 . Out of nine schools, six schools had four teachers with four different feedback treatments in each having : self-analysis through audiotape in 'E_1' group, supervisory feedback in 'E_2' group, supervisory-cum-audiotape in 'E_3' group, and integrated skill-based traditional supervision in 'F' group, whereas in three schools, three different feedback treatments in 'E_1', 'E_2', and 'F' groups in each were implemented considering one teacher in each group.

2.1.4. Tools Used :

The following tools were used for collection of data related to the general teaching competence and summated scores on the five teaching skills of general teaching competence at pretest, post test and retention test phase; teachers' attitudes towards teaching at pretest and post test phase; teachers' reactions towards microteaching at post test phase and acquisition of specific five teaching skills during microteaching technique. A brief description of all the tools used in the study with their purposes is given in the Table 2.5 .

(a) Ahluwalia's Teacher Attitude Inventory (ATAI) :

The attitude inventory, developed by Ahluwalia (1974) consists of ninety items or statements distributed over six sub-scales constructed on the lines of Likert summated ratings procedure. Each sub-scale has fifteen statements that pertain

TABLE : 2.5 : A Brief Description of Tools :

Sr.No.	Name of Tool	Variables	Purpose
1.	Personal Information Sheet.	Demographic Variables.	Description of Sample.
2.	Baroda General Teaching Competence (BGTC) Schedule.	(a) General Teaching Competence.	Criterion.
		(b) Summated Scores on the Five Teaching Skills of General Teaching Competence.	Criterion.
3.	Ahluwalia's Teacher Attitude Inventory (ATAI).	Teachers' Attitude towards Teaching.	Criterion.
4.	Self-Evaluation Proforma(Only for teachers under micro-teaching).	Teachers' Reactions towards Microteaching.	Criterion.
5.	Observation Schedules (both rating and frequency type) for Skills of -	Skills of	Criterion
	i) Probing Questioning.	i) Probing Questiong.	-do-
	ii) Explaining.	ii) Explaining.	-do-
	iii) Illustrating with Examples.	iii) Illustrating with examples.	-do-
	iv) Stimulus variation.	iv) Stimulus variation.	-do-
	v) Reinforcement.	v) Reinforcement.	-do-

to a particular aspect of prospective and practising teachers' professional attitudes. The attitudes towards : (i) teaching profession, (ii) classroom teaching, (iii) child control practices, (iv) educational prcoess, (v) pupils, and (vi) teachers,

are the six aspects included in the inventory. Out of the ninety statements fiftysix are in positive declarative form and thirty four of them are in negetive form. Again fortythree statements, are meant to assess attitude in favourable direction and forty seven in unfavourable direction. Each item is assigned a weight renging from four (strongly agree) to zero (strongly disagree) for favourable items. In the case of unfavourable items range of weights is reversed i.e. from zero (strongly agree) to four (strongly disagree). The attitude scale of a teacher is the sum total of item scores of all the six sub-scales. The theoretical range of scores is from 0 to 360 with the higher score indicating the more favourable attitude towards teaching profession. The split-Half reliability is found to be 0.79 (n=239). The test retest reliability after intervals of 3 months and 9 months are found to be 0.59 (n=102) and 0.64 (n=290). The inventory has a satisfactory content validity. State-wise and area-wise norms for the five Hindi speaking states are avialable. (For the scale, see Appendix-B).

(b) Baroda General Teaching Competence (BGTC) Schedule :

This tool has been developed at the Centre of Advanced Study in Education, Baroda for measuring the general teaching competence of the teacher in classroom performances. It has twenty one items related to twenty one teaching skills on the five broad categories : planning (pre-instructional), presentation (instructional), closing, evaluation, and managerial aspects measuring on a seven point scale ranging from zero (not at all) to six (very much). The range of scores is from 0 to 126 with the higher score indicating more

on the development of general teaching competence of a teacher. Based mostly on the lists of teaching skills developed at the Stanford University, the Far West Laboratory and CASE, Baroda these twenty one teaching skills have been conceptualized and these are the essential ingredients for general teaching competence. A glossary to the key terms used in this BGTC scale has also been provided along with this scale. Though this schedule has not been standardised and norms have not been developed, yet it has been validated in Indian context using it in Three National Projects undertaken by NCERT, and other researchers for their Ph.D. work. (For Scale, see Appendix-A).

c) Observation Schedule for Teaching Skills :

During feedback treatments in microteaching the observers use the prescribed evaluation proformas for evaluating the teachers' achievement on teaching competencies on the five teaching skills, namely, skill of probing questioning, explaining, illustrating with examples, stimulus variation and reinforcement. For each skill two types of evaluation schedules are used. The first one is of frequency type where the observation schedule is used to note the frequency of occurrence of each of the behavioural components of a particular skill. The other one is of rating type, having seven-point scale ranging from zero (not at all) to six (very much) for each of the behavioural components of that skill only. Among these two observation schedules the frequency type tells the trainee the direction of improvement in terms of frequencies of

increasing the desirable and decreasing the undesirable behaviours, where as the rating type tells the quantitative aspect of desirable and undesirable behaviours. During practice, the supervisor used both the types of schedules to know the extent of the teachers' achievement in acquisition of a particular skill. When the teacher was in self-analysis during feedback sessions he himself used these two Observation Schedules with the assitance of audiotape. All these Observation Schedules in each skill have been developed by Passi (1976), Lalithamma (1976) and Joshi (1977). (Appendix-D).

d) Self Evaluation Proforma :

This evaluation proforma aims at knowning the reactions, comments and suggestions of the in-service teachers joining through the microteaching treatments. To investigate the reactions towards microteaching, acquisition of teaching skills, integration of skills in normal classroom teaching, the participating teachers in microteaching groups filled up this proforma on twelve aspects. These aspects are constituted on teaching competence; suggestions towards modelling, feedback, individual teaching skills, etc.; integration of teaching skills in classroom performances; superiority of skill based microteaching; and overall views towards microteaching. This proforma was developed by the investigator in consultation with the eminent educationists in the field of teachers' training and experienced teachers in secondary schools. In this questionnaire the above twelve - - - - - - -

aspects related to open-ended items are emphasized. (For this proforma, see Appendix-C).

2.1.5. Schematic Representation of the Design :

After considering the independent and dependent variables of this experimental study, the nature of the sample of in-service teachers, and the various tools used, an experimental pretest-posttest parallel group design was followed to test the hypotheses. A schematic representation of the design of this study is given here which involved a six-phased programme.

FIGURE : 2.1 : Schematic Representation of the Design

Phase I (Pretest)	1) Three Macrolessons were observed and evaluated through the BGTC Schedule in each 'E_1', 'E_2', 'E_3' and 'F' group. 2) The ATAI was administered to teachers of all the groups 'E_1', 'E_2','E_3' & 'F'.
Phase II (Modelling)	Five Skills explained, Literatures of each skill supplied, and Demonstration lesson in micro-situation was given on each skill to 'E_1', 'E_2', 'E_3' and 'F' Groups.

	E_1(n=9)	E_2(n=9)	E_3(n=6)	F (n=9)
Phase III (Practice of Teaching Skills)	Self-analysis through audio tape feedback.	Supervisory feedback.	Supervisory-cum-audio-tape feedback.	'Filler' group with skill-based traditional supervision.
	Skill Training through Micro-teaching.	Skill Training through Micro-teaching.	Skill Training through Micro-teaching.	Skill Training through Macro teaching.
	Skill-1(2 Lessons)	Skill-1(2 Lessons)	Skill-1(2 Lessons)	10 Lessons were supervised in traditional pattern emphasising teaching skills in an integrated approach.
	Skill-2(")	Skill-2(")	Skill-2(")	
	Skill-3(")	Skill-3(")	Skill-3(")	
	Skill-4(")	Skill-4(")	Skill-4(")	
	Skill-5(")	Skill-5(")	Skill-5(")	
	(5x2)=10 Lessons.	(5x2)=10 Lessons	(5x2)=10 Lessons.	
Total	10x9 Micro-lessons	10x9=90 Microlessons	10x6=60 Microlessons	10x9=90 Macrolessons

(The teaching practice of each of the teachers in the groups in each school was equal).

Phase IV (Skill Integration).	Explaining the Integration of Skills with examples/ episodes and demonstrating in macro-situation to the teachers of 'E_1', 'E_2', 'E_3', and 'F' groups.
Phase V (Post-test).	1) Five Macrolessons were observed and evaluated through the BGTC in each 'E_1', 'E_2', 'E_3', and 'F' group. 2) The ATAI was administered to teachers of all the groups 3) The Self-Evaluation Proforma was administered to teachers of each of the 'E_1', 'E_2',&'E_3' groups.
Phase VI (Retention test).	Three Macrolessons were observed and evaluated through the BGTC in each 'E_1', 'E_2', 'E_3', and 'F' group after one month of post testing, (i.e.after Phase V).

As per the schematic design, the Phase I was the pretest phase where the initial standards of the teachers in all the groups were observed in general teaching competence, summated scores on the specific five teaching skills, and teachers' attitudes towards teaching. For this purpose the BGTC Schedule and the ATAI were administered at this phase. The phase II programme was the modelling phase where both symbolic and perceptual models were undertaken. The third phase was the practice phase. The teachers of 'E_1', 'E_2', and 'E_3' groups practised the five teaching skills under various feedback treatments : self-analysis through audiotape feedback, supervisory feedback and supervisory-cum-audiotape feedback respectively through microteaching. The teachers of 'F' group practised the same skills in an integrated approach through traditional supervisory practices in traditional training. However, nearly equivalent treatments and work loads of all the teachers were adopted for all the four groups of 'E_1', 'E_2', 'E_3', and 'F'. An integration of the practice of teaching skills in macro situations in the fourth phase was performed. The phase V was the post test phase where the BGTC Schedule and the ATAI were again administered to determine the changes occured on the same criterion measures from pretest phase to post test phase. Also at this stage the data were collected through Self-Evaluation Proforma on the teachers' reactions towards microteaching. After a gap of one month of the post test phase the retention test was administered during Phase VI to observe the nature of behavioural patterns on the

same criterion measures as in pretest and post test phase. The detailed procedures of this study as per the design is given in the following captions.

2.2. TREATMENTS :

As per the design of the study, thirty three in-service teachers of nine secondary schools were grouped into four treatment groups of 'E_1', 'E_2', 'E_3' and 'F' . In each school the experiment was performed by taking one teacher for each of the four groups and all the four treatments were completed simultaneously. After completing the experiment in one school the investigator proceeded to another school for implementing the same treatments to other teachers of the four groups 'E_1', 'E_2', 'E_3', and 'F'. He adopted this procedures of in-campus training because it was impossible for him to call all the thirty three teachers to an off-campus treatment. Nearly thirty to forty days were devoted in each school for complete implementation of this treatment. In this way the situational intervening variables were minimised. The four teachers were treated in four groups simultaneously but independently with their own pupils. The administrative and academic facilities or hinderances, if any, were the same for all the teachers in each school.

In Orissa the educational session begins from the month of June and ends in May in an academic year. This project was started in the month of July, 1976 and completed by the end of May, 1977.

The investigator acted simultaneously as an organiser, coordinator, resource personnel for supplying models in teaching skills through discussions and demonstrations, supervisor both in microteaching groups of 'E_2' and 'E_3' and in traditional practices for the 'filler' group 'F', and an observer for assessing the general teaching competence during classroom teaching. As the investigator conducted the experimental and 'filler' groups the biases of the experimenter towards any of the groups were minimised. He tried his best to act in every situation objectively and impartially.

A standard procedure about the number of pupils in the microlessons and the time exposed in microteaching cycle for the practice of a teaching skill was adopted throughout the whole experimental study in all the nine schools. Six pupils were taken for a class of microlesson during 'teach' session and another group of six pupils of the same class were taken in 'reteach' session. Regarding time exposed for practice through microteaching the teacher practised one skill during 'teach' session for eight minutes, 'feedback' for eight minutes, 'replanning' for eight minutes, 'reteach' for eight minutes, and 'refeedback' for eight minutes. This duration of forty minutes was in equivalent to the normal classroom teaching period. In each skill, as per the design each teacher in 'E_1', 'E_2' and 'E_3' group practised two lessons which were equivalent to two microteaching cycles and completed ten microlessons for five skills whereas, the teachers in 'F' group practised an equivalent ten macrolessons integrating all the five teaching skills in traditional manner.

2.2.1. Reliability in Observation :

Before proceeding to implement the experiment as per the design in the selected schools the investigator contacted an experienced retired Headmaster to assist the investigator as a second observer to observe the macrolessons of the teachers during pretest, post test, and retention test. Ryan (1969) stated some essential characteristics of an efficient observer : (a) sensory acuity, (b) perceptual speed, (c) general mental alertness, (d) the ability to observe and recall details, (e) understanding and acceptance of definitions of behaviours to be observed, (f) ability to maintain attention - not easily distracted by non-essentials, (g) familiarity with the behaviours to be observed, and certainly, (h) ability to set aside personal predispositions and biases which might influence perception of the behaviours to be observed. Considering these qualities associated with efficient observation the said person was selected as an observer.

He was supplied the glossary of the BGTC Schedule and a thorough discussion was held with him on twenty one teaching skills in the BGTC Schedule. The investigator also had a discussion with this observer about the procedure of integration of all the five skills of probing questioning, explaining, illustrating with examples, stimulus variation, and reinforcement into a macrolesson. After the discussions about the content of the BGTC Schedule, assessment procedures were discussed with the

observer. Ryan interpreted that the processes of observation and assessment were interdependent, and the relative success or failure of the method of direct observation could be judged only in terms of the resulting assessments. In turn, he said that the success of assessments depended upon the appropriateness, efficiency, and practicability of the assessment devices employed and the skill - with which they were used by observers.

For enhancing the reliability of this evaluation during the observations of behaviours, both the observer and the inverstigator emphasised the following points during their discussions :

(i) only attending the specific behavioural components in the BGTC Schedule without considering the possibilities other than the BGTC;

(ii) assessing the behaviours as per the guidelines in the glossary of the BGTC Schedule and the literatures on each skill (five skills) supplied by the investigator;

(iii) focussing attention on the specified behaviours and carefully avoiding the influence of general impressions and unusual behaviours;

(iv) assessing immediately the behaviour during and shortly following observations;

(v) assessing independently each specified behaviour without any outside assistance;

(vi) suppressing the personal biases related to any individual teacher or behaviour; and

(vii) avoiding the rating biases like : leniency error, giving average ratings or central tendency error, etc.

Moreover, to maximise the inter-reliability in observation the investigator and the said observer simultaneously but independently observed the normal classroom performances of all the teachers during their pretest, post test and retention test throughout the nine schools. On this issue Lehmann and Mehrens (1971) suggested that in pretest-post test control group design, observer bias could be controlled by having the same observers for all the groups.

2.2.2. Implementing the Treatment :

Prior to actual treatment in a particular school, an introductory talk about the project with its implications to the teaching-learning process in general and teacher behaviour in particular was given to the teachers and the Headmaster of the school. The overall objectives of this project were explained during this introductory talk. The investigator discussed the characteristics of a good teacher, the teaching skills for developing the teaching competence, the developed teaching-learning process, the improved teacher behaviour through acquisition of skills, the need of in-service teachers' training programme, the activities and performances of in-service teachers to meet these needs, the concept of microteaching and its skill-based approach. A detailed programme for implementating the experimental project was chalked out in consultation

with the Headmaster and participating project teachers.

A. Pretest Phase :

As per the Phase I of the Schematic Design three normal lessons of each participating teacher of 'E_1', 'E_2', 'E_3' and 'F' groups in macro-situation (in normal classroom) were observed and evaluated by the observer and the investigator through the BGTC Schedule. For each teacher atleast one lesson was observed on each day so as to give scope of equal opportunity to all the teachers. The ATAI was administered to these teachers during this phase to know the initial scores in attitude inventory of the teachers towards teaching. This pretest phase was completed in three days in each school.

B. Modelling Phase :

Both perceptual and symbolic modelling were exposed to all the four teachers of 'E_1', 'E_2', 'E_3' and 'F' groups.

The teachers were provided with the literature on each skill. One by one the skills were discussed in details : the meaning, nature and components of the skill. The doubts and difficulties on each skill, its components and sub-components were clarified giving a number of concrete examples from the classroom situations. Four days were spent for this symbolic modelling because of off-hour discussions after schooling and availability of all the four teachers at a time.

After discussion of the skill, the investigator himself demonstrated each teaching skill in micro-situation taking six pupils for eight minutes in real conditions. All the participating teachers including the teacher in 'filler' group and the observer observed these model lessons. Following the model lesson half-an-hour critical discussion was held. The participating teachers learned how to discriminate and identify the component behaviours of the skill.

C. Orientation Before Practice Phase :

Before proceeding to actual practice treatment in Phase III, a discussion was held with the participating teachers of 'E_1', 'E_2', and 'E_3' groups on microteaching cycle, and microlesson plan. Similarly a separate discussion was also held with the other teacher in 'F' group on adopting the five teaching skills in an integrated approach, the specific procedure of using these skills in various subject content, and the macrolesson planning. Keeping the model in view each teacher planned his lessons which were thoroughly checked and improved by the investigator. The teacher in the group 'E_1' was shown how to operate of casette recorder for getting audio-tape feedback. All teachers were acquinted with the Observation Schedules of both the frequency and rating type provided for each skill for getting feedback during micro-teaching practice.

D. Practice Phase of Skill Acquisition :

As per the Phase III of the design, the teachers in 'E_1', 'E_2' and 'E_3' groups practised the teaching skills under various feedback treatments : 'E_1' group under self-analysis through audiotape feedback, 'E_2' group under supervisory feedback and 'E_3' group having supervisory-cum-audiotape feedback. The teacher in 'F' group practised traditional teaching emphasising those teaching skills on an integrated approach in macrolessons. The teachers in three experimental groups practised the five teaching skills of probing questioning, explaining, illustrating with examples, stimulus variation, and reinforcement, one by one, taking two lessons in each skill; whereas the teacher in the 'filler' group practised ten equivalent macrolessons. The investigator acted as supervisor in both the experimental groups of 'E_2' and 'E_3' during 'feedback' and 'refeedback' sessions in microteaching practices and in the 'filler' group of 'F' in macrolessons. But after 'teach' and 'reteach' sessions the microteacher in group 'E_1' received feedback through self-analysis listening to the tape recorder and using self-evaluation with observation schedules. The class time table was so arranged that the teaching load of all the four teachers were kept equal during this practice phase. All kinds of biases and intervening variables were minimised to a large extent and equal importance was given to all the groups.

E. Orientation Phase on Skill Integration :

After practice phase, discussion regarding the skill of integration of these five teaching skills in macro-situation was held for about one hour taking specific examples on various subject content from the normal classroom situation. A demonstration lesson on science subject was taken by the investigator in a normal class in which all the five teaching skills were integrated. A critical discussion also followed for identifying the component behaviours and the ways of integration of skills. This completed the phase IV programme of the experimentation.

F. Post test Phase :

Phase V, aiming at post test measurement included observations of five macrolessons given by each of the teachers in the groups 'E_1', 'E_2', 'E_3' and 'F' under normal classroom situation. These lessons were observed through the BGTC Schedule by the same observer and the investigator by using the standard procedures. The ATAI was also administered again on these teachers. The Self-Evaluation Proforma was collected from each of the teachers in 'E_1', 'E_2' and 'E_3' groups only, not from 'F' group, to know the reactions towards microteaching.

Just after completing all the phases of the project in one school, the investigator and the observer proceeded to another school as per the scheduled in Table 2.4. for implementing the same project.

G. Phase on Retention Test :

After one month of posttesting in the former school, the same team of observers again proceeded back to that school for retention test. The three macrolessons of all the four teachers were observed and evaluated through the BGTC Schedule.

The Figure 2.2 represents a design of the whole experimentation in nine secondary schools.

2.3. STATISTICAL TECHNIQUES EMPLOYED :

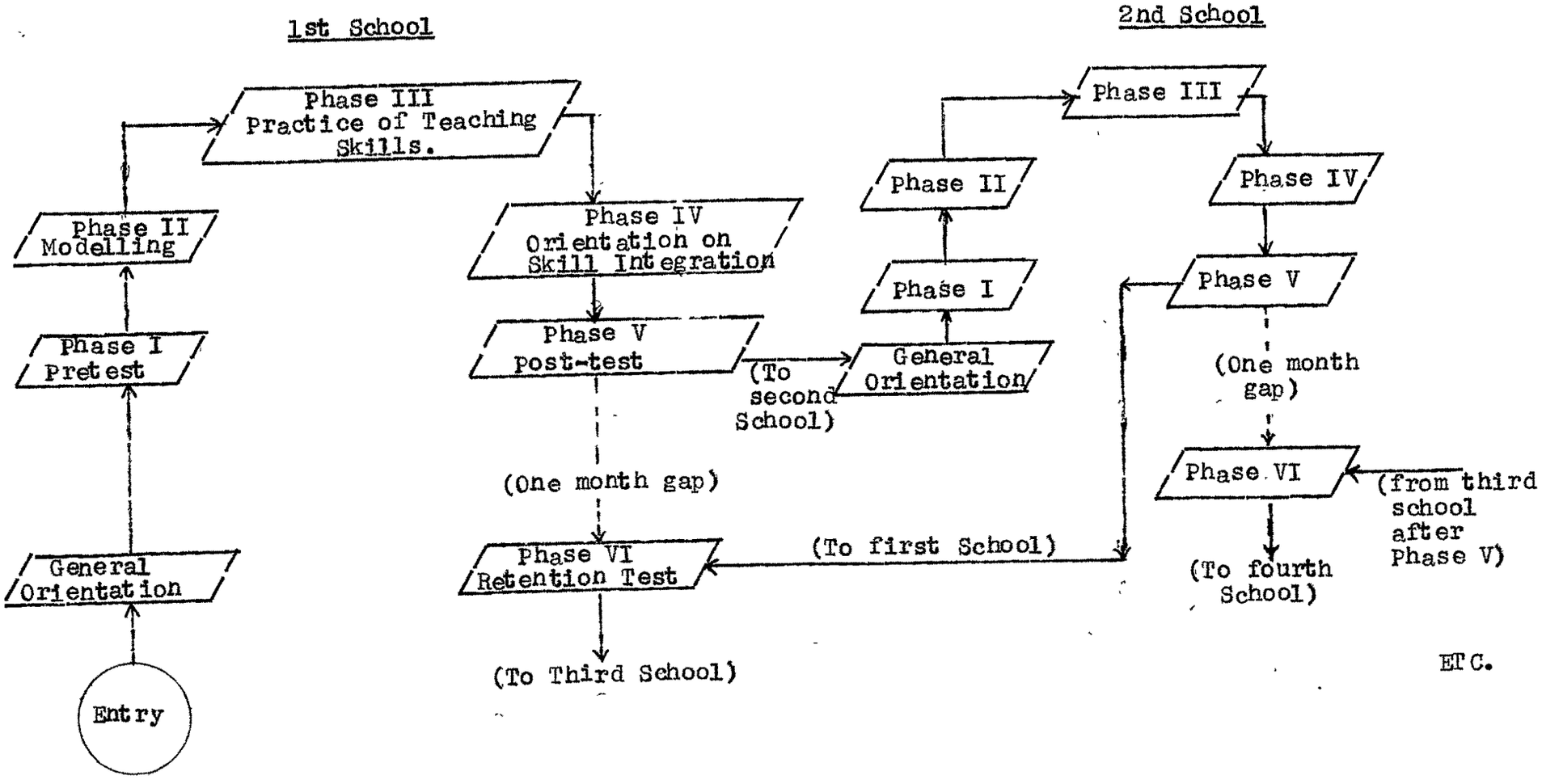
The data on general teaching competence measured through the BGTC Schedule of each individual teacher at the pretest, posttest and retention test and attitudes towards teaching evaluated through the ATAI at the pretest and posttest measures were pooled and converted to gain scores as follows :

G_1 - Gain score indicating the difference between posttest and pretest scores of general teaching competence measured through the BGTC Schedule.

G_2 - Gain score indicating difference between retention test and pretest scores of general teaching competence measured through the BGTC Schedule.

G_3 - Gain score indicating difference between retention test and posttest scores of general teaching competence measured through the BGTC Schedule.

FIGURE : 2.2 : Design of the Experimentation in Nine Secondary Schools.



G_4 - Gain score indicating difference between posttest and pretest scores of attitudes of the teachers towards teaching measured through ATAI.

S_1 - Gain score indicating difference between posttest and pretest of summated scores of teaching competence, specific to the five teaching skills measured through the BGTC Schedule.

S_2 - Gain score indicating difference between retention test and pretest of summated scores of teaching competence, specific to the five teaching skills measured through the BGTC Schedule.

S_3 - Gain score indicating difference between retention test and posttest of summated scores of teaching competence, specific to the five teaching skills measured through the BGTC Schedule.

Data through the Self-Evaluation Proformas were collected from the teachers participating in microteaching technique and these data were subjected to content analysis.

Both parametric and non-parametric statistical measures were employed in testing the hypotheses to fulfil the objectives of this study. But before adopting these inferential measures, the following descriptive statistical measures were calculated and depicted :

(i) the mean raw scores of general teaching competence (GTC) and S.D. at pretest, posttest and retention test,

(ii) the mean gain scores from pretest/posttest to posttest/ retention test on GTC (G_1, G_2, and G_3) and their S.D.,

(iii) the mean gain in summated scores from pretest/posttest to posttest/retention test on the specific five teaching skills, a part of GTC (S_1, S_2, S_3) and their S.D., and,

(iv) the mean gain scores from pretest to posttest on teachers' attitudes towards teaching (G_4) along with S.D.

At the outset of the analysis, the homogeneity of population variances within the four groups : E_1 (n=9), E_2(n=9), E_3 (n=6) and F (n=9) was tested by Hartley's test determining the ratio of the largest sample variance to the smallest variance.

Then one-factor Analysis of Variance (ANOVA) was employed during the testing the hypotheses to find out the significant mean differences among the teachers of the four groups simultaneously. The computation of ANOVA for each of the hypotheses was made as per the procedure adopted by Guilford and Fruchter (1973).

Based on Hopkins and Chadbourn's Schema (Glass and Stanley, 1970) for making the multiple comparisons among the means of the contrasting groups, the Scheffe' method (S-method)

was applied for testing hypotheses. This method of multiple comparison was regarded as superior to other methods because of its generality (equal n's are not necessary) and greater sensitivity as per the statement of Glass and Stanley. After finding a significant F-Value through ANOVA, this S-method was applied to test the significance of mean differences between the six contrasting pairs i.e. 'E_1' and 'F'; 'E_2' and 'F'; 'E_3' and 'F'; 'E_3' and 'E_2'; 'E_3' and 'E_1'; and 'E_2' and 'E_1'. The absolute values of the ratios were calculated as per the computation procedures of Scheffe' method, laid down in the volume of Glass and Stanley (1970). Moreover, the confidence intervals around estimates of contrast were also obtained.

Because of the smallness of the sample, non-parametric tests were also used to confirm the findings of parametric tests. Wilcoxon matched-pairs signed-ranks test was used to state both the direction and the relative magnitude of the differences between the matched pairs. For computation procedures the reference was made to the volume, by Siegel (1956).