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CHAPTER I

INTRODUCTION

1.0.0 The Present Study

The present study, entitled, 'Effects of modeling and Microteaching on the Acquisition of Certain Skills in Questioning' is an experimental study pertaining to the area of practice teaching in teacher education. It aims at the experimental verification of the efficacy of two types of modeling and microteaching treatments on the acquisition of skills in questioning. There are many skills which go to make an effective teacher. Before choosing a particular skill for practice, the following points will have to be considered : (i) the skill chosen for the study should yield immediate dividends, (ii) the skill so chosen should be capable of being analysed into simple operational terms, (iii) it should be capable of being understood so as to be practised easily, and (iv) it should not involve any use of sophisticated gadgets and complecated arrangements as far as possible. As questioning skills meet the above criteria, questioning skills were chosen for the study.

How can the skills be presented? How can a prospective teacher practise the skills without any inhibition? Knowledge of the skill is necessary before it is mastered through practice, but mere knowledge does not ensure proficiency. Practising the skill with understanding and with the immediate and objective knowledge of the results of the performance - feedback - leads to speedy and effective acquisition of the skill. A 'safe practice' ground is necessary where a prospective teacher may try the skill, receive feedback, and improve upon his previous performance. Microteaching provides for the 'safe practice' ground with an emphasis on 'learning through doing'. Acquiring knowledge either through reading of the written scripts or through listening may serve as 'modelings' for presenting the skills. Various models depicting the use of a particular skill can be developed. They may be either written or audiotaped. By adopting microteaching as one of the treatment variables along with modeling treatments for acquiring the skills in questioning, it is expected that the present investigation may provide an answer to the problem of enabling the prospective teachers to acquire skills in teaching effectively and economically.

It is now a trite saying that no system of education can rise above the level of its teachers (Mathur 1973). If there is one single factor that primarily determines the efficiency of the educational process and the effectiveness of educational product, that factor is teacher. Teaching though familiar is known to be a complex task because it is often subtle in its effects upon the learners. Effective teaching should result in purposeful learning by involving the pupils in an elective and interesting dialogue with the teacher. A scientific theory based on philosophical, sociological, and psychological principles can be mastered. Skills can be acquired in a comparatively lesser time under expert guidance, but the 'art of teaching' takes a life time to develop. How can teachers be helped to acquire this 'art of teaching'? Can teachers be trained? Training by itself can not produce an effective teacher. The division of professional courses into theory and practice parts is really artificial, for theory without practice is unproductive and sterile while practice without theory is blind. Even while helping the teachers to acquire a 'safety minimum of teaching skills', questions like, 'what skill? What [redacted] minimum length of practice is required to achieve acceptable performance?

Where should it be conducted? What form should it take? Who should supervise it? Should he be a member of the college staff who has lost contact with classroom teaching? or Should he be a practical classroom teacher who is not generally an academician? How can practice teaching be assessed? Should it be a subjective rating scale or an objective videotape or an audiotape?

The above and so many other academic, practical, and administrative considerations have made the task of teacher training more complex and complicated. What kinds of innovations in teacher education are needed in order to ensure high quality of teachers? How can they be effective in their classrooms meeting the challenges and shape the destinity of India?

The chapter comprises the captions : (i) practice teaching in India, (ii) approaches to practice teaching, (iii) modeling, (iv) microteaching, (v) questioning skills, (vi) statement of the problem, (vii) objectives of the study, (viii) delimitation of the problem, and (ix) hypotheses. The captions (i) to (v) include overviews of related literature and studies pertaining to the respective area. The succeeding

chapters are devoted to method and procedure with results of the pilot stage; results and interpretation with emerging trends of the phase-II; results and interpretation with discussion of the results of phase-III; conclusions and their educational implication; and summary of the investigation.

1.1.0 Practice Teaching in India

University Education Commission (1948) recommended that practice teaching must get sufficient time in relation to the theoretical courses. The Secondary Education Commission (1953) devoted a full chapter to the discussion of dynamic methods of teaching suggesting that practice teaching should be conceived broadly. The Education Commission (1966) observed, '.....At present, the student teachers are required to give a specified number of lessons, which are often unsupervised or illsupervised. The practice of continuous block teaching, the duration of which varies from two to six weeks is adopted only in a few institutions and its organization still leaves much to be desired' (p. 74). Palsane and Ghanchi (1967) having surveyed the practice teaching of sixtyseven colleges of education of this country reported a lot of difference from college to college regarding the number of lessons each

trainee is expected to give and quantity and quality of work required. Only a few institutions had more than five demonstration lessons a year with either casual or no discussion after them. Joseph (1967) found no uniformity regarding the number of periods of practice teaching and different items of practical work among the training institutions from Kerala. Mallaya (1968) reported that practical work was neglected in the training institutions of Madhya Pradesh. Sharma (1968) found that most of the training colleges confined their practical work to forty to fifty lessons based on Herbartian steps. Shrivastava (1970) reported that supervision of student teaching was done casually with little serious intent to improve the student teacher's performance. Passi and Sharma (1974) have listed ten inadequacies of student teaching, the prominent being : (i) unscientific supervision, (ii) practice programmes not suited to individual talents, and (iii) no relationship between theorical teaching and practical skills of teaching. Kohli (1973) reported the opinions of past students of the training colleges, headmasters and school teachers, and teacher educators from Panjab favouring curtailment of theory portion to fifty percent and enriching the practical side accordingly.

The above overview suggests the failure of present practice teaching programmes in meeting the needs of the prospective teachers. What a prospective teacher wants to know really is 'What should I do in the classroom?'

Practice teaching appears to be such a common sense concept that almost all teachers, college tutors, and prospective teachers accept it without challenging its fundamentals. What sort of activity do the participants have in mind when they participate in practice teaching? Before a prospective teacher proceeds to classroom teaching he must have a clearcut and unitary concept so as to enable him to master the practical 'art of teaching'. A review of the current approaches to practice teaching will prove useful to understand this concept of practice teaching.

1.2.0 Approaches to Practice Teaching

Approaches to practice teaching can be classified under two categories : traditional approaches and scientific approaches. These two approaches are reviewed and discussed in the paragraphs that follow.

1.2.1 Traditional Approaches

(a) 'Master the teaching model' Approach

Traditionally, prospective teachers are required to observe experienced teachers teaching the classes. The prospective teachers are supposed to observe the teaching carefully and are expected to learn 'how to teach' by imitation. Stones and Morris (1972) describe this as 'Sitting with Nellie' - a factory worker doing the same job for years and to whom new recruits are attached for learning the job. The craft apprentice concept, mentioned above, has been designated by Stolurow (1965) as 'modeling the master teacher'. The analogy is striking and quite old. The master teacher is compared to the master craftsman and teaching practice is viewed as a process of initiation. The master teacher's teaching skills, performance, personality and attitudes are acquired by the students through observation, imitation and practice. Peters (1968) concludes that teaching is highly personal business and argnes that the teacher should model himself on a more skilled exemplar. Stones and Morris (1972) put forth the following arguments against the above approach : (i) master teacher can offer a limited set of skills to the student teacher; (ii) this approach denies the individuality of the student teacher;

(iii) it tells a student teacher to adopt another persons style which probably involves his changing of his personality; and (iv) finally it does not help the student to go beyond the teaching that is observed. 'Model the master teacher' approach though appears to be widely favoured ultimately leads to conservatism and traditionalism, and operates against the spirit of experimentation and innovation. This approach stands for imitation rather than analysis.

(b) The 'born teacher' Approach

Akin to the 'model the master teacher' approach is the view that 'teaching is caught and not taught'. This approach assumes that no body has ever succeeded in teaching anyone how to teach. Teaching, like other creative arts of painting or writing poetry, can be facilitated by teaching but can not, itself, be taught. Ability being largely innate is least amenable to training. The born teacher knows the right moment for the right behaviour. The born teacher is endowed with abilities which are rare and are generally never questioned.

This approach claims a complete certainty by attributing the effectiveness largely to the genetic endowment

which is disproved by experiment and experience. This approach acts as an obstacle in the proper understanding of practice teaching. The present methods of practical preparation of teachers though not that systematic, they do help some of the prospective teachers to acquire teaching skills to some extent. This approach takes the rational thinker to a dead end. The present educational system demanding teachers in thousands can not depend upon the teachers to 'be born' which is a very rare commodity.

1.2.2 Scientific Approaches

(a) 'Master the Teaching Model' Approach

As against 'model the master teacher' approach, Stolurow (1965) describes 'master the teaching model' approach to practical teaching experience making it possible, and necessary the integration of theory and practice (Stones and Morris, 1972). This approach offers practical help to all prospective teachers irrespective of their personality, attitudes, and abilities.

With the current focus upon life and language of the classrooms (Bellack, 1966; Jackson, 1968; Flanders, 1961 and 1970) it has now become possible to give more or less

an objective account of different aspects of everyday teaching. Concentrating on what a teacher does in the classroom while teaching is a good place to begin an analysis of a teacher's job. Davies (1969) briefly referred to the developments leading to the possibilities of new approaches to practice teaching similar to job analysis in industry. Analysis of teacher behaviour provides ample opportunities of comparing teachers on different dimensions of behaviour, resulting in noting down the possible association between the teaching behaviour and emerging responses of the students. The techniques of observation along with analysis of teaching behaviour have provided a reliable tool for systematic enquiry by both student teachers and their supervisors into the classroom teaching, and also into the techniques used in the training of teachers. An anthology of seventynine classroom observation systems is now available for use (Simon and Boyer, 1967 and 1970). With these developments, it has become possible to clarify different relationships between the interacting elements and develop a conceptual frame work capable of being converted into plans. These represent the various models of teaching. Evaluation procedures to validate models by collecting evidence can be developed. Stones and

Morris (1972) refer to a number of teaching models (Strasser, 1967; Taba and Elzey, 1964; Smith, 1963; Flanders, 1961). Strasser's model, it is reported, was being developed under the triple influence of Taba's concepts of the 'tactics and strategy'; Smith's analysis of teaching, and Flander's classroom interaction studies.

When a prospective teacher develops and tries his own model and receives immediate and accurate feedback on his performance, he gets committed to a position, which helps evaluation. Having successfully tried a model or models in the classroom during practice teaching, the prospective teacher develops insights into the teaching-learning process giving him confidence. Mastering a model to suite his personality is now possible enabling him to develop a teaching style of his own. With the systematic observation and planning, interpretation and diagnosis of learner behaviour, it is possible to develop a dynamic instructional process over a period of time.

(b) The Clinical Approach

It was realized for quite sometime that a prospective teacher can not be educated away from the realities of the

classroom. If the theory which he learns in his classroom is meant for strengthening his classroom teaching, then classrooms should become the testing laboratories, where the prospective teacher experiments, probes further into the practical 'art of teaching'. With the right type of guidance at the right moment from the supervisor, the prospective teacher expands and develops his understanding of teaching. The entire supervisory process has become more analytical and clinical in its approach. This has resulted in giving more security with reduction in tension to the prospective teacher during his classroom teaching.

According to Bennie (1972), the practice of placing the prospective teacher in a classroom situation, say for hour per day, making him share the teaching responsibilities with his colleagues and teacher, underwent a change along with terminology. Practice teaching gave way to student teaching where the prospective teacher is considered as a student of teaching during the classroom experience learning while teaching. Laboratory schools are meant to provide pre-student teaching experiences with experimentation and research facilities. In order to provide for wider and longer teaching

experiences, the college of education has to move to the public school making student teaching largely an off-campus activity. This resulted in developing and using new terms like internship, cooperating teacher, college supervisor, student teacher, etc. Clinical experiences are now understood as those experiences that enable the prospective teacher to participate in all aspects of teaching in an active and a positive role. They help to improve his understanding and readiness to assume the teaching role itself. 'The whole emphasis in all clinical experiences is diagnostic and analytical' (Bennie, 1972 p. 18). Internship can not be a substitute for student teaching but rather a supplementary experience to the student teaching assignment.

In this approach the total role of the teacher and the school in the community gets a close critical look. It enables the prospective teacher to analyse his teaching to the point when the application of the approaches result in developing scientific skills reaching an appreciable level of teaching competency.

(c) Behaviour Modification Approach

Teacher education programmes are conceptualized as

behaviour modification systems designed to modify complex behavioral repertoires which are adaptable to a variety of learning problems. This approach includes an analysis of five components and the relationships among them. These components are (i) prior stimulation (S); (ii) biological state of the organism (O); (iii) response repertoire (R); (iv) contingency relationships (K); (v) consequences (C). In most instances, the behavioral consequences serve as stimuli activating the next set of behaviour (McDonald, 1973). The above analysis suggests that every behaviour can be considered as a function of specific determinents. The classical conditioning paradigm emphasizes the relationships of events prior to the occurence of the response - antecedent conditions. The operent conditioning pradigm, however, stresses the after effects of the response - consequent conditions. Since teaching behaviour is sets of responses emitted by one human being (teacher) which is expected to elicit or strengthen desired responses in another (student), the teacher has to take into account both the antecedent and consequent conditions. Systems facilitating the acquisition of diverse classes of teaching behaviours, such as developing goal descriptions; planning learning strategies; evaluating;

establishing mutually self-enhancing relations with students; and using teaching methods will have to be devised. Teachers will have to be trained to apply behaviour modification principles to acquire effective methods of teaching. Behaviour modification systems for students to learn complex acts like reasoning; problem solving; and aesthetic evaluation need to be evolved. At present, it is reported (McDonald, 1973) that a very small number of student behaviours have been brought under control by applying these principles. Applying behaviour modification principles will stimulate, it is hoped, a reorganization of teacher education programmes with behaviour change and acquisition of teaching skills as their primary goals. In this connection microteaching and simulation can be conceived as behaviour modification techniques having wide applications in teacher training. Stones and Morris (1972) remarked, 'Simulation techniques, for all their artificiality, can often be preferable to putting students into the classroom to learn on their own' (p. 70). Classroom simulation removes the risk from the first steps of the prospective teacher enabling him to learn a complex skill in teaching without the stress of the real situation. Simulation offers greater control over the teaching variables. Cruickshank (1968) has

developed a teacher training system which can present the prospective teacher with up to thirtyone different simulated problems related to teaching. The aim of his 'Teaching Problems Laboratory' is for the prospective teacher to assume the role of the teacher and to practice solving the critical teaching problems he has identified. Cruickshank, however, considers that much work needs to be done to develop the techniques of simulation. Possibilities are also opened up for classroom teachers to analyse their own classroom behaviour.

(d) The Technical Skills Approach

A complex activity like teaching is often analysed into a number of subskills for the sake of better understanding Gage (1967) observed that technical skills are specific instructional techniques and procedure that a teacher may use in the classroom. They represent an analysis of teaching process into relatively discrete components that can be used in different combinations in the continuous act of teaching. The criteria of general usefulness and consensus among experts appear to dominate the selection of a particular skill. The most important aspect of this approach is that an attempt is being made to analyse teaching into limited well defined

components that can be understood, observed, described, practised, evaluated, controlled, and predicted (Gage, 1968). Using behaviourally defined skills makes it much easier to derive objective, reliable measures of changes in teacher behaviour. More meaningful investigations of the relationship between teacher performance and pupil learning have become possible working with technical skills.

What skills should be chosen for practice? Allen and Ryan (1969) have made it clear that decissions regarding the selection and development of the skills in the clinic resulted from the discussions and debates of the microteaching staff. Grifiths (1972) raises a question, namely, how specific should the analysis of teaching skill be? It appears that large research effort aimed at isolation and validation of skills in teaching is needed. Lalithamma (1975) is working on developing a skill based practice teaching programme at the CASE, Baroda. Passi (1975); Joshi (1975) and Lalithamma (1975) are developing instructional materials on the lines of Mincourse Hand Books (Borg, et.al. 1971; Perrott, 1975).

The skills listed by Allen and Ryan (1969 p. 15) are as under : (i) stimulus variation, (ii) set induction,

(iii) closure, (iv) silence and nonverbal cues, (v) reinforcement of student participation, (vi) fluency in asking questions, (vii) probing questions, (viii) higher order questions, (ix) divergent questions, (x) recognizing attending behaviour, (xi) illustration and use of examples, (xii) lecturing, (xiii) planned repetition, (xiv) completeness of communication. Passi and Shah (1974) report eighteen skills which have been analysed at the Far West Laboratory for educational research and development. To the above listed skills, an addition of four skills, namely, (i) using A.V. aids; (ii) teacher liveliness in the classroom; (iii) promoting group discussion; and (iv) teacher explanation is made.

Flanders (1973) identified fifteen basic teaching skills demanded by the varied types of transactions. They were as follows : (i) ability to express and explain ideas clearly; (ii) ability to give directions that are clearly understood; (iii) ability to give corrective feedback or criticism; (iv) ability to ask narrow questions to which correct and incorrect answers can be easily identified; (v) ability to reiterate, paraphrase or expand ideas suggested by pupils; (vi) ability to compare ideas of pupils or make use of pupils suggestions to move one step further in problem

solving; (vii) ability to guide inductive thought cycle toward higher levels of cognitive thought; (viii) ability to formulate questions which make use of pupils ideas; (ix) ability to form open questions which encourage pupils to express their own ideas; (x) ability to introduce his own ideas without inhibiting the further expression of pupil ideas; (xi) ability to analyse ideas objectively; (xii) ability to deal satisfactorily with unexpected statements of pupil initiative when a responsive statement was expected; (xiii) ability to inventory pupil ideas as he listens; (xiv) ability to acknowledge those ideas which are not selected so as to support pupil participation; (xv) ability to guide conversations according to models of inductive and deductive thinking.

The fifteen skills listed above are based on verbal communication and thus refer to that one part of teaching. Two core skill areas were nominated : (a) responsive acts which make use of pupils ideas, and which occur just after a pupil stops talking; and (b) initiatary acts which solicit pupil participation and which often occur just before a pupil starts talking. These technical skills formed the basis of practice teaching programme known as 'microteaching' considered as a major innovation in student teaching.

While summarizing the contributions of different areas to the development of different theories and practices of teaching, Stones and Morris (1972) observed that growing volume of material is available on which a scientific approach to teaching can be based. Taxonomies of educational objectives (Bloom et.al., 1956; Krothwohl, 1964) have helped to the preparation of detail objectives suitable for classroom fulfilment. Works of Medley and Mitzel (1963a and 1963b), Flanders (1961 and 1970), Bellack and Others (1966) have helped to study the verbal behaviour of teacher and pupils and to link it to pupils learning. Taba (1965) developed tools, techniques, and strategies for producing cognitive growth in pupils. Kounin (1970) puts the problems of discipline on a scientific footing. Ryans (1960a) and Getzel and Jackson (1963) researched on relationship between teacher's personality traits and the teachers' and pupils' behaviour. Biddle and Thomas (1966) studied teachers' concepts of their role and their performance. Thus it is clear that scientific approach is mainly responsible for the development of new techniques such as microteaching, simulation, modeling, technical skills in teaching, audio and/or video feedback which have placed the practice of teaching on a sound and scientific footing.

The following paragraphs present a review of research studies in modeling, microteaching, and questioning skills which form the major considerations of this study.

1.3.0 Modeling

Modeling has been defined as 'an individual demonstrating particular behaviour patterns which the observers learn through imitation' (Allen and Ryan, 1969). New responses may either be learned or characteristics of the existing responses may be changed as a function of observing the behaviours of others. Lloyd Morgan (1896), Tarde (1903), and McDougall (1908) regarded imitativeness as innate or constitutional process. The concept of imitation was fully integrated into a behaviour theory frame work by Miller and Dollard (1941). A motivated subject has to be positively reinforced for matching the correct responses of the model. Imitative learning is viewed as contingent on the observer's performing closely to the matching behaviour before the observer can acquire it immitatively.

The major objective of modeling for teachers is to enable them to exercise greater control over their own behaviour in classroom situations. For this purpose, it is

necessary for the teacher to know clearly what he is to observe and what is the purpose of his observation when a complex teaching act is separated into its component parts, many skills can be isolated. Skills like holding attention, varying a stimulus, or asking thought provking questions and others are isolated. The application of modeling a component skill involves defining clearly the skill and constructing a model capable of guiding the trainee. The model may be presented before or after his first teaching encounter. When a prospective teacher sits at the back of the classroom, what he observes is a complex of several skills the master teacher is performing simultaneously. These skills are often integrated into highly individualistic style difficult for the prospective teacher to analyse and comprehend. A model for teaching must be so developed in order to make the large set of relationships explicit. It must also permit the cofrection of mistakes made in trying to find out about teaching. How should the model be presented to teachers?

Borg, Kelley, Langer and Gall (1970) observed that a film or a handbook model would best serve the objective of building an easily disseminated, reasonably priced product. The most economical model would be a handbook containing

presentation of a teaching skill as series of verbal interaction. This type of presentation has been called symbolic modeling as the responses to be acquired are described in symbols - words. A display of the actual performance - a master teacher demonstrating a skill - has been called as perceptual modelinng. Although it may seem that perceptual modeling will be more effective than symbolic modeling, the difficulties involved in controlling observer's attention when he is viewing a performance considerably attennate whatever advantages such display may have. However, filmed or videotaped models can be used indefinitely with no recurring expenses as a consistent quality teaching demonstration to be given to the learner. A typical microteaching sequence begins with either studying symbolic models or viewing videotaped or filmed models.

Orme (1966) attempted a study employing six experimental conditions exposing interns to symbolic modeling, perceptual modeling, or a combination of both. Feedback was one more conditions. It was found that all six conditions yielded significant gains, a combination of both the perceptual and the symbolic being the most productive. The studies by Allen, Berliner, McDonald and Sobol (1967) did not

reveal significant differences between the use of symbolic and perceptual models in the acquisition of skill in asking higher order questions. The investigators explained the difference in findings between their study and Orme's study by pointing at the superfluous character of the video-model for the questioning skill which is predominently verbal in nature. White (1968) found that an audiotape model led to a significant increase in preservice teachers' use of the indirect behaviours of Flander's Interaction Analysis Category System. The studies undertaken by Bandura and Huston (1961); Bandura, Ross, and Ross (1961, 1963a, 1963b) revealed that filmed models were as effective as live models in shaping children's aggressive behaviour and problemsolving behaviour. Koran (1968) compared the effectiveness of positive and/or negative models of student and/or teacher behaviours. No significant differences were reported. Claus (1969) while studying higher order questioning behaviours of teachers reported that modeling accompanied by supervisor's pointing out the essential characteristics of the skill proved to be more effective than modeling without any supervisor's comments.

Philips (1973) studied the effect of videotaped modeling procedure on the verbal question phrasing practices of secondary student teachers. The main purpose of the study was to determine the effects of a perceptual modeling concept versus a symbolic modeling concept of a question categorizing system on the verbal behaviours of student teachers. The experimental and control groups each received four periods of instruction regarding a modified Aschner-Gallagher questioning category system. The experimental group instruction was presented via videotape, prepared handouts and discussion. The control group had four periods of discussions, handouts and other verbal means only. The results were reported to be inconsistent with other research on the use of perceptual models. Lerner (1974) studied the effects of selected models of feedback on teacher behaviour in a microteaching situation. The mode of feedback seemed to have no differential effects on the subject's ability to use the process of science. Bassett (1975) studied the effects of clinic form of supervision on questioning as a teaching skill. Significant difference was found for both the experimental group and control group (with no supervisory feedback) when compared on

pretest-posttest basis. Acheson (1974) studied two microteaching variations written versus videotape modeling and audiotape versus videotape feeback. Comparisons of pre and post training tapes of teaching performance indicated that the variations are of equal effectiveness in increasing teacher's use of higher cognitive questions.

Some of the variables in modeling that affect learning have been studied. Bandura, Ross and Ross (1961) examined the influence of the sex of the model and the sex of the child on the imitation of agression. In a second study by the same investigators (1963a) boys again displayed significantly more aggression than girls, and again an aggressive male model proved to be a more powerful stimulus for aggression than an aggressive female model. The competence of model and the learning of imitation and non-imitation was studied by Rosenbaum and Tucker (1962). Bandura and Kupers (1963) studied the transmission of patterns of self-reinforcement through modeling while Kanfer and Duerfeldt (1967) investigated the effects of the modeling procedures early or late in subjects learning. These variables may or may not be significant in modeling the

teaching skills unless their significance is tested in classroom behaviours of teachers who have been trained through the use of modeling. Besides these variables, other variables like the content of the lesson; ambiguous or unambiguous occurances of modeled teaching behaviours; quality of production depending upon the colour, camera angle and sound if filmed or videotaped models are used, also mediate the effectiveness of perceptual models. Comparisons between perceptual and symbolic modeling could be made if the quality and content of both models could be made equivalent in complexity and comprehension. McAleese and Unwin (1971) foroposed the following combinations of media that could be used to present a model of a skill : (i) an oral description of the skill; (ii) a written description of the skill; (iii) audiotape giving examples of the skill in action; (iv) sixteen mm. or eight mm. film possibly in colour with sound; (v) video tape; and (vi) various combinations of the above. Young (1969) found that most effective protocol is a combination of specific illustration model, and a complete model with a super imposed sound track drawing attention to salient features of the skill.

Before actually presenting the model some pertinent questions will have to be answered -

(1) How should the model be presented to teachers?

(2) Should the subject matter of the model be the same as the trainee will be teaching in his classroom?

(3) Should the skill be exaggerated or not?

(4) Should there be repetition of the skill in different forms of the model or should only one example be given, and this be repeated several times?

(5) Should the model be set at the same level of experience of the trainee teacher or should it be at higher level of experience of trainee teacher?

1.4.0 Microteaching

Flanders observes, ".....In a relatively short period of less than ten years microteaching has been created, refined and applied in the field. This is despite the alleged gap between theory and practice, between university thinking and realities of classrooms" (Allen and Ryan, 1969 pp. 13-14). Microteaching can be described as a laboratory technique in

which complexities of the normal classroom teaching are simplified (Allen and Ryan, 1969; Perberg, 1972). A trainee teaches a class of three to five students, the duration of the lesson is also reduced to five to fifteen minutes and is used to practice one particular skill in teaching-lecturing, questioning, etc. The lesson is usually recorded on a videotape and the trainee hears and sees himself immediately after the lesson. The analysis and suggestions of the supervisor, who attended the lesson or observed the videotape, and other sources of feedback assist the trainee in restructuring the lesson which is retaught and recritiqued, if necessary.

A typical microteaching sequence may be described as follows : A specific skill in teaching - say asking probing questions is clearly identified, defined, and is translated behaviourally. It is then presented either in the form of symbolic modeling or perceptual modeling so as to enable the trainee teacher to get acquainted with the specific skill. The trainee then plans a lesson of about five to fifteen minutes depicting the modeled skill and teaches it to about three to seven with a very specific purpose. This

teaching may be either real or simulated - the students might be fellow trainees and not real students from the schools. The lesson would be observed by the instructor keeping a close look on the trainee's use of the said skill. The supervisor may make a video recording of the lesson. The trainee and the supervisor, immediately after the microlesson, get together to discuss the performance or to review the replay of the recorded videotape. Based either on the self-viewing and/or supervisors comments the lesson is replanned and retaught to a different group of pupils with another recritique meeting to be followed, if necessary. With the elimination of some of the complexities of the normal classroom and the content to be taught, thus, enables the trainee to focus upon one component skill of the complex act of teaching. With the immediate and pin-pointed feedback made available, the trainee can improve upon his previous performance during reteach session. This appears to be the reason for being optimistic about the potentiality of microteaching in improving skill in teaching. Evidence available in support of the above statement is given below.

Ward (1968) found in a survey of American Colleges and Universities that 176 institutions were using microteaching

in their teacher training programmes. Allen and Ryan (1969) cite a survey of student teaching programme undertaken by Johnson which showed that microteaching was being used in fiftythree percent of such programmes. More than fifty percent of institutions in Australia involved in teacher training have introduced some form of microteaching (Turney, 1973). Lawless (1971) described microteaching without hardloose developments at the University of Malawi. Evan (1970) deals with the application of microteaching in developing countries in Africa, while Jacobson (1970) reports microteaching being used in the Universities of Dar-es-Salaam and of Nairobi. Collins (1969) reports variations of microteaching being used at the Universities of Botswana, Lesotha, and Swaziland. Microteaching has been introduced in U.K. by several institutions including the University of Stirling, New University of Ulster, Lancaster University, and at the Exeter University.

Research evidence available from countries other than India regarding effectiveness of microteaching and other aspects connected with it is summerized in the following paragraphs.

Goodkind (1968) reported that microteaching created greater awareness in specific personal habits and mannerisms when compared with conventional student teaching. Kallenbach and Gall (1969) reported that microteaching was not found either superior to or inferior to conventional student teaching in terms of ratings of teacher effectiveness on the Stanford Teacher Competence Appraisal Guide. The investigator, however, reported that microteaching took only one-fifth of the time than the conventional student teaching programmes for reaching the same level of efficiency. Fortune, Cooper, and Allen (1967) found that microteaching was an effective technique as indicated by significant behaviour changes produced by the M.A. candidates at Stanford on nine of the first twelve items of the Stanford Teacher Competence Appraisal Guide. Shore (1972) found that microteaching was a safe setting for the acquisition of skills in teaching. This was in confirmation with the findings of Allen and Ryan (1969). Surveying the research on microteaching conducted by Berliner (1969), Young and Young (1969), Kallenbach (1967), and Wragg (1971), Stones and Morris (1972) observed that microteaching was successful in achieving the

goals in terms of the behavioural changes of teachers that were set for their studies. Allen and Fortune (1967) analysed experiences at the clinic at Stanford for the year 1963 and 1964. They reported that students trained through microteaching performed better than students trained through traditional methods and the time taken for the training was quite less. In addition to this, the performance in the microteaching situation has become a rather reliable predictor of practice training grades later on. Student teachers found microteaching very useful (Ward, 1969; Turney, 1970; Perrot and Duthie, 1970). Webb and others (1968) conducted opinion surveys of random samples from a group of 700 students. They found that in one instance 88 percent (N=81) and in another instance 87 percent indicated positive attitude towards simulated microteaching. McIntyre and Duthie (1972) studied reactions to microteaching and reported that a great majority (N=128) of students found microteaching interesting and valuable. However, it was reported that the most frequent comment was that the relevance of microteaching to normal classroom situations was limited because of the absense of discipline problems in microteaching. Hoerner (1969) reported the finding that teaching real students as compared with

teaching peers did not result in significant differences in terms of teacher behaviour change. Raymond (1974) used microteaching format for practising the skill of 'set induction' using peers as pupils while 'real' students from local schools were used for practising the skill of asking 'probing questions'. No significant differences because of the pupils and peers could be obtained. McLendon (1973) used microteaching sequence for teaching the 'reflective method' to undergraduates in social studies.

Gregory (1974) reported the findings of five studies completed in one phase of a comprehensive research programme on teacher effectiveness which sought procedures for aiding teachers in the acquisition and expression of hypothetico-deductive verbal structuring through microteaching. Corley (1973) studied the effects of the use of microteaching in an inservice programme for experienced teachers of adults in health profession. Allen (1973) reported a study comparing microteaching and traditional method of instruction for improving performance of a manipulative demonstration in industrial education. There was an evidence of an overall significant difference in favour of the microteaching group

as compared with the traditional method group. The skills that showed significant differences were : (i) developing main points, (ii) closure, (iii) varying stimulus, (iv) mathemagenic questioning, (v) probing questions, and (vi) reinforcement. Illingworth (1974) studied the effect of supervisory feedback and feedback by team members only in microteaching. The judges rated the lesson for the skill of effective questioning. The final means of pooled judges ratings for the two groups and the control group with no feedback showed a significant difference. It was indicated that all groups accepted microteaching technique. DeMarte (1974) studied the effect of microteaching on the intentions, perceptions, and classroom verbal behaviour. In order to answer the question related to the effectiveness of microteaching as a teacher training procedure a pretest-posttest control group design was used. One group received microteaching training in a specific teaching skill while the other group viewed perceptual models (videotaped) as training in the same teaching skill. The FIACS was used to measure teacher's actual classroom behaviour. Teachers trained through microteaching differed significantly from

those trained with perceptual models in their intention and selfperception of using criticism in the classroom verbal behaviour.

In India, Tiwari (1967) completed a project on microteaching. The approach was pupil biased and had no intention of improving teacher behaviour. Chudasama (1971) found that microteachers as compared with teachers from control group (without microteaching) made significant gains (at .01 level) in both indirect teacher behaviour and teacher behaviour providing for freedom of response to pupils. Shah (1970) reported that the use of a tape recorder was quite helpful to inservice teachers in correcting their mistakes. A study undertaken by Passi and Shah (1974) showed that favourable attitudes towards microteaching were developed and microteaching was reported to be effective with both real classroom situation (school students) and simulated classroom situation. Marker (1972) reported a study using microteaching for the student teachers in Geography method group for the skills : set induction; stimulus variation; questioning; reinforcement; and closure. Tangible improvements were reported. Bhattacharya (1974) studied the relationship

between the effectiveness of microteaching and conventional practice teaching in developing the teaching skill indirectness (based on the FIACS) in the inservice teacher training programme of polytechnic teachers in Eastern India. It was reported that significant changes were produced by the group receiving microteaching treatment indicating microteaching to be more effective than conventional practice teaching. Singh (1974) also reported that microteaching was better than the traditional training programme. It was an experimental study with pretest and posttest on a sample of ten students. Abraham (1974) studied the effectiveness of microteaching on the acquisition of skill in 'fluency in questioning' and asking 'probing questions'. Significant differences between reteach-I and reteach-II were reported for both the skills. Joshi (1974) studied the effect of microteaching on the acquisition of skills in using silence and nonverbal cues, and reinforcement and found that microteaching produced significant changes in the behaviour of student teachers.

Though quantitative evidence with systematic procedures is not available, it is gratifying to note that microteaching produced encouraging results. Before any

systematic investigation in this respect has to be undertaken the following points will have to be answered :

(1) Should 'real' students (from schools) be used for microteaching sessions? Should their number be three, four or five?

(2) Should microteaching be tried as an inservice or preservice teacher training device?

(3) What should be the duration of the teach and reteach sessions? Three minutes, five minutes or ten minutes, or fifteen minutes?

(4) How many cycles should be planned?

(5) Who should give the feedback? Peers, college tutor, experienced teacher or tape recorder to be used as a self-feedback device?

(6) What should be the suitable time? Morning, noon or evening?

(7) What should be the time gap between teach and reteach?

(8) How should the skills be presented? Symbolically, perceptually or filmed or through any other device?

1.5.0 Questioning

Questions have been long recognized as the indispensible tool in the hands of educators. Aschner (1961) describes a teacher as a professional 'question maker'. A question is a verbal utterance that seeks a response from the person to whom it is directed (Cunnigham, 1971). Questions used by teachers and those incorporated in the instructional materials probably are significant in guiding the development of pupils' levels of knowledge and achievement. Questions reveal the operational objectives which stress the increase of knowledge of facts, understandings of concepts, and the skill of incorporating information and ideas. The direction as well as the level of learning are greatly influenced by the various questions the students encounter. Available studies of effect of questioning on student achievement are reviewed in the following paragraphs.

Sharma (1972) has attempted to find out the relative effects of four teaching patterns, namely - narration, open questions, narrow questions, and narrow questions with feedback upon pupil attainment in terms of knowledge, comprehension, and application objectives. It was found that

narrow questions were more effective than open questions in the realization knowledge and comprehension objectives. In a similar study Roy (1975) is aiming at finding out the effect of three stytistic variations of teaching on pupil achievement. Shaida (1975) is attempting to study the effects of questioning and feedback upon the attainment of pupils. He is using narrow questions with feedback, and wihout feedback; broad questions with feedback, and without feedback to study the pupil achievement. George (1975) is studying teacher question ratios (TQR) for convergent and divergent questions. Thakor (1973), Kumar (1975) and Kaul (1975) studied the questioning behaviours of teachers teaching different subjects and tried to compare them. Shepardson (1973) studied the influence of teacher questioning and response behaviour on student participation during classroom discussion. The specific problem was 'do changes in teacher questioning and response behaviour result in concomitant predictable changes in the amount of student participation?' It was found that the teacher behaviours of probing for clarification and probing for cause and effect relationships, and specific individual praise response consistently had the highest correlation with student

participation. Beseda (1973) studied the effects of levels of questioning on pupil achievement and critical thinking ability. It was concluded that though training and feedback to student teachers increased their divergent questions, it resulted in decreasing the scores in critical thinking of the students. Bedwell (1975) reported a study of effects of training teachers in questioning skill on the achievement and attitude of elementary pupils. The hypothesis that teachers using a high level questioning strategy would effect greater student achievement and more positive attitudes than teachers using low level questioning strategy, was not supported. In a similar study, Barker (1975) tried to determine whether preservice elementary teachers trained in questioning strategies would produce a concomitant effect in the number and levels of questions clicited from elementary pupils. It was reported that during twentyfour microteaching situations the experimental group asked significantly more questions and significantly more high level questions. There was no significant difference in the number of questions or the levels of questions asked by the pupils. Adams (1975) examined the relationship between teacher use of higher level

cognitive questions and development of critical thinking in intermediate elementary students. The findings of the study support the effectiveness of teacher use of higher cognitive level questions in the development of critical thinking of the students. The findings provide a justification for the development of teacher education programmes and instructional material based on inquiry teaching. Chism (1973) carried out an investigation with a view to analyze the changes in pupil behaviours and in teacher behaviours resulting from the instruction of teacher in the use of a selected questioning strategies. It was concluded that five one-hour training sessions in the effective questioning techniques did bring about a change in the levels of questions teachers asked during classroom discussion. The teachers could 'lift' the level of their pupils' thinking as revealed by the fact that when the teachers asked more high level questions, the pupils responded with a longer number of high level answers. It was also noted that most of the children involved in the study seemed interested in the topics of the discussions and most of them did participate in them.

The evidence cited above is not conclusive in respect of teacher questioning and its effect on student thinking or achievement. But there is a growing body of evidence which indicates that teacher questioning has an influence on pupil thinking and attitudes. Much of the responsibility of maximizing the effects of questioning, however, lies with the teacher.

Cognitive transactions beginning with a few structuring remarks followed by approval of pupil's comment and contributions and then a series of specific requests by the teacher seeking elaboration and extension of certain idea [redacted] suggested by the pupils appear to produce good effects. (Spaulding, 1963; Solomon, et al. 1963; Conners and Eisenberg, 1966; Soar, 1966; Furst, 1967; Fortune, 1967). Teachers using questions as a predominent mode of classroom transactions have classes with superior achievement than those teachers prefering other forms of transactions. (Conners and Eisenberg, 1966; Harris and Serwer, 1966; Wallen, 1966). Spaulding (1963) found that teachers asking relatively vague and unstructured questions in contrast to highly structured and specific questions had classes where the

achievement of pupils was lower. Responding to pupils' further clarifying questions or probing the answers given by the students further appeared to result in higher achievement. (Spalding, 1963; Soar, 1966; Fortune, 1967).

Research, however, indicates that the predominent emphasis of teachers questions appears to be to search for knowledge of facts. Stevens (1912) studied the rate of questions in the classrooms of secondary teachers of English and social studies. She observed that the teachers asked questions emphasizing memory than any other mental process. Teachers did most of the talking which often resulted in smothering the pupils' responses. She recommended that teachers should talk less and questions should be used intelligently so as to stimulate reflective thought. The objectives of most of the questions appearing in the classroom tests and textbooks and other instructional material is also to test memory (Pfeiffer and Davis, 1965; Davis and Hunkins, 1966; Windley, 1966). Floyd (1960) analysed a sample of 1,347 questions and evaluated them on a point system. Those questions received about thirtyone percent of the total possible points. Fewer than 100

questions were judged as capable of stimulating reflection. About six percent were judged worthy of thinking about and answering. Questions after classifying them by types revealed the fact that about fortytwo percent emphasized memory of specific facts and twentythree percent information on specific facts, about nine percent questions were direction giving either requests or demands, eight percent involved criticisms and three percent comparisons. Thus, memory questions formed about seventyfive percent, Adams (1964) had confirmed the above conclusions.

Buch (1975) reported a study conducted under the cooperative project on productive teaching (COOPT) to identify the verbal behaviour patterns obtaining in the Indian classrooms and to compare the same with the norms given by Flanders (1970). The study covered 500 classrooms in nine states and union territories of India. The teacher question ratio (TQR) was found to be 16.32 which is below than for an American teacher (26). Study of the verbal behaviour of selected teachers from the secondary schools of Baroda with the FIACS, Buch and Santhanam (1970) reported 1251 tallies for category '4' (asking questions) of the FIACS, out of the total of 14,786 tallies which is roughly 8.38 percent.

Perhaps the ease with which teachers employ questioning techniques might have led to the neglect of his behaviour. Teachers are not able to employ comprehensive questioning patterns without an awareness of techniques for lifting levels of thought, expanding and using learner ideas (Carner,1963; Guzak, 1967). Gall (1970) observed relative pausity of research regarding whether a significant relationship existed between the kinds of questions posed by teachers (high level and low level) and any resultant student behaviour. Hunkins (1968) found that students guided by preponderance of analysis - evaluation questions scored significantly higher on a post test of achievement in social studies than the students guided by knowledge type questions developed for the same materials. Buggy (1972) and Tyler (1972) reported that achievements of second grade students was significantly and positively affected by higher level questions posed by the teacher. Savage (1972), however, found no such relationship existed with the fifth grade students.

Ryan (1973) studied the differential effects of levels of questioning on student achievement. Ryan's scheme

of classification of questions was dichotomized into low level questioning (Recall Category) and high level questioning which included six categories : process, relationship, application, educated guess, synthesis and opinion. The lesson plans were written in such a manner that High level Question group (HQ) had approximately seventyfive percent of the questions posed by teachers belonging to the high level category; while the LQ group had about ninetyfive percent of the questions belonging to low level category, that is emphasizing memory. The results of the study suggested that high level questions were more efficient in producing high level understanding. It appeared that high level questioning if posed in some methodical manner would encourage students to think at higher levels. The students exposed to the preponderance of low level questions tended to assume low level involvement and either rejected or failed to perceive any higher level response possibilities.

Classification of Questions

Crump (1970) examined the role played by varying levels of cognitive behaviour and suggested a classification

of questions based upon their cognitive functions. She tried to effect changes in questioning behaviour through programmed learning materials. The text was structured around a simple hierarchy of four levels of questions, namely, reproduction, translation, reflection and, valuation. The first two categories are 'convergent' in nature required to check factual recall or recognition or 'reproduction' of information. The 'reflection' and 'valuation' categories are 'divergent' in nature requiring answers beyond information and the translation of original into another form requiring analysis, synthesis, prediction and generalization. After an examination of 3,289 oral and written questions drawn from the pre- and post-test instruction period for participating teachers, the investigator found that self instruction resulted in increased number of questions drawn from higher cognitive levels. 89 percent of the pre-instruction oral and written questions were dominated by reproduction and translation questions the proportion which was reduced to 73.4 percent in post-test period.

"Questions can be either 'narrow' or 'broad' depending upon their scope" (Amidon and Hunter, 1967, pp. 11-12). Narrow questions require low level thinking and

short answers. The responses are predictable as they allow only a limited number of right answers. Broad questions are questions that permit a variety of acceptance responses. This makes broad questions unpredictable. They are questions which are considred to be thought provoking. Broad questions are the means of enhancing development of intellectual skills. Minor (1966) classifies questions as real questions and 'synthetic' questions. Hoskisson (1974) classified questions as 'true' and 'false' questions. 'True' questions are those for which the teacher has assumptions but is willing to entertain other points of view and reflect on alternatives given. If the purpose is to have the pupils answer the questions for which the teacher has the 'correct' answers, then he is asking 'false' questions. The teachers purpose should be to find an answer to his own question by involving the pupils in a discussion, trying at the same time developing awareness and understanding of the significance and implications of the questions asked. This type of procedure should result in fostering reflective thinking.

Bloom's (1956) 'Taxonomy of Educational objectives in Cognitive domain'; Guilford's (1956) 'Structure of the

Intellect'; Smith and Meux's (1960) 'Study of Logic of Thinking' have provided bases for classifying questions according to the level of thinking they encourage. Sander's (1966) 'Questions what kinds?' is based on Bloom's taxonomy where Sanders has split comprehension into 'interpretation' and 'translation' the other categories for both the systems remain the same. According to Sander's (1966) the categories of questions are evaluative questions, synthesis, analysis, application, interpretation, translation and memory questions. This is a hierarchy with memory at the base which forms the core of all higher thought process. Gallagher (1964) used Guilford's (1956) bases for classifying questions and categories questions as C.M. questions based on cognitive memory, convergent questions based on convergent thinking, divergent questions based on divergent thinking and evaluative questions based on evaluative thinking. Smith's and Meux's classification is based on logic and the questioning behaviour is described as 'defining'; 'describing'; 'stating'; 'reporting'; 'opining'; 'evaluating'; etc. Batchelder and others (1964) have developed a descriptive functional classification system of question in new situation, 'definition and explanation', 'recall' and 'summary', etc.

Gallagher (1964, pp. 24-25) further classified the cognitive memory as reflected through students' responses as recall, define, identify, answering 'Yes' or 'No'; 'designate', 'name' types of C-M questions. In answering these questions memory is brought into function. The other category of 'narrow' questions is 'convergent' questions, which is reflected in 'explaining', 'stating relationships' and 'comparing and contrasting' answering behaviours of pupils. In answering a 'convergent' question the pupil has to put the facts together and is required to construct an answer. In doing this the pupil recalls some facts, tries to associate or relate these facts and tries to give an explanation in his words.

The category of 'divergent' question is broader in nature. The answers to such questions are not necessarily predictable. Being thought provoking in nature, 'divergent' questions create new problem situation and require the pupil to synthesize ideas and develop a solution. In arriving at a solution the pupil may be required to hypothesize, predict or infer. Naturally, this type of questions stimulate

interest and provide motivation for exploration and experimentation. 'Divergent' questions are a powerful tool in developing in children the ability to handle new problematic situations. Thompson and Bowers (1968) studied the effects of convergent and divergent questions. Soar (1966) and Furst (1967) found evidence for the superiority of variation in questioning.

Evaluative questions, according to Gallagher (1965, pp. 26-27) require pupil to justify a choice, to defend a position to judge, and to value. The pupil is required to take a self-selected position. The judgement of the pupil may be according to his standard or a student set by someone else. Where the criteria are clearly set no justification is required, the question becomes no more than cognitive-memory or convergent. Because of this quality, evaluative questions can either be broad or narrow and hence are likely to produce difficulties in classification.

Besides these categories there are 'yes-no' type of questions, 'ambiguous' questions, 'confusing' questions and 'spoon-feeding' questions meaning of which is quite

evident and which are undesirable elements of an effective teaching behaviour.

Since participation of the whole class in a teaching-learning situation is necessary, questions will have to be adequate in number so as to be equitably distributed all over the class. Volunteers as well as non-volunteers will have to be called to have better balance in participation. This requires a variety of questions at different levels encouraging several pupils to respond. The best way to achieve participation by the pupils is to take up their idea and try to elaborate it with several follow-up questions. The fluency of questions depends upon teacher's repeating his own questions, answering his own questions and repeating the answers given by the students. Hence it is advisable to avoid such repeatition to make questions effective and thought provoking.

The problem of dealing with incomplete answer from the pupil involves modifying the pupil's initial response so as to match a criterion response which may be an abstract idea or a concept. Pupils habituated or conditioned to give short answers may not like to give

lengthy responses. This response pattern can be established if the teacher reinforces more and more of the students giving longer responses. The teacher may put a question, listen carefully to the student, reinforce the correct part, seek further clarification of the inappropriate part and reinforce the longer student responses. This may involve giving suggestions to the pupil to develop a longer responses. This procedure is known as 'probing' behaviour and involves prompting by the teacher, seeking more clarification and refocussing.

1.5.1 Probing Questions

The aim of probing questions, according to Hamphill (1968) is to guide the pupil to more complete and thoughtful responses. Probing behaviours include prompting, seeking clarification, refocussing. According to Hamphill and others rephrasing is not a probing type of behaviour since it consists in merely rewording the question. Redirection is not regarded as probing since the same question is asked to another student. Probing questions are addressed to the same student to take the student response to a criterion level.

Authors, it appears, disagree with the above view. Rosenshine (1971) mentions researches in which probing was used in a much wider sense than the one Hamphill and others (1968) have used above. Soar (1966) recognizes following three varieties as probing procedure : (a) teacher encourages further answers to fact questions, (b) teacher encourages further explanations, and (c) teacher encourages interrelationships, generalizations, and problem solutions. Wright and Nuthall (1970) included asking questions on the same cognitive level to the same student-alternative subsequent question or to another student (redirect question), or asking question at a higher thought level (reciprocates to lift). Though different investigators used the word 'probing' to mean differently making varied operational definitions, 'probing' is intended to lead a student toward a more comprehensive answer than the one he initially gave.

1.5.2 Convergent Questions

Questions belonging to this category are narrow because there is usually one 'best' or right answer. They are broader than cognitive memory (Weigand, 1972) questions

because they require a person to put facts together and construct an answer. Convergent questions are closely related to convergent thinking. According to Aschner and Gallagher (1968) convergent thinking is a thought operation involving the analysis and integration of given or remembered data. It leads to one expected result because of the tightly structured frame work putting limits on it. Responding to a convergent question the mental operations of explaining, associating, and concluding may be required to be performed.

Aschner & Gallagher (1968) in their system have elaborated convergent questioning behaviours as under :-

(a) Translation - Shifting conceptual material from symbolic figural content to semantic or vice-versa.

(b) Association - involving likenesses and differences; degrees of comparison; relationship of direction; spotial position, and classification.

(c) Explanation - rational explanation; value explanation; and narrative explanation.

(d) Concluding - generalization including integrating prior remarks with more general reformulation; summary

conclusions; and logical conclusions involving a deductively drawn implication from the materials.

The 'cue' word in such questions happens to be 'why', a typical question found in textbooks.

1.5.3 Divergent Questions

These questions are broader in nature than convergent questions. They permit more than one acceptable response. The answers to these questions are not generally predictable as these are thought provoking questions. In answering such questions the pupil has to organize elements into new patterns that were not clearly organized before. Divergent questions might create new problem situations and require the pupil to synthesize ideas and construct a new meaningful solution. In responding to divergent questions the pupil may perform operation of predicting; hypothesizing; infering, and reconstructing. According to Aschner and Gallagher (1968) in a divergent thinking sequence individuals are free to generate their own data independently in a data-poor situation often taking a new direction or perspective. Divergent questioning behaviours may be described as under (Aschner and Gallagher, 1968) :-

(a) Elaboration - (may be either structured or free)

Building upon a point already made; developing a point but not shifting to a new point.

(b) Divergent Association - (may be either structured or free)

Constructing a relationship between ideas; casting a central idea into sharper and often unexpected perspective by comparisons and analogies.

(c) Implications - (may be structured or free)

Extrapolation beyond the given; projection from given data consequent to hypothetical construction of new points of possibility.

(d) Synthesis - spontaneous performance involving integration of current central idea with an entirely new point or frame of reference.

How can our teachers be trained to exploit fully the potential of questions? With a view to developing effective training programmes to this effects following points are raised :

1. What type of questioning skills be selected for training the teacher in question asking

skills? narrow or broader; true or false; restricted thinking or expanded thinking questions.

2. What should be the training format? giving the trainee teacher printed or cyclostyled material explaining the use or making the trainee to discriminate between different types of questions when presented or through making him teach in the classroom.

3. How can teachers be made to ask more thought provoking questions?

Keeping in view the questions raised at the end of captions (v), (vi), and (vii), the following investigation was proposed to be undertaken.

1.6.0 Statement of the Problem

The problem can be stated as under : To Study the 'Effects of Modeling and Microteaching on the Acquisition of Certain Skills in Questioning'. The treatments were expected to produce differential effects in terms of raw scores at different stages of acquisition of the skills.

1.7.0 Objectives of the Study

1. To develop different types of models depicting the use of three different skills in asking questions.
2. To study the effects of modeling and microteaching treatments on the acquisition of skills in questioning.
3. To study the global classroom performance before and after training.

1.8.0 Delimitation of the Problem

The study was confined to the three subskills in questioning behaviour, namely - asking probing questions; asking convergent questions, and asking divergent questions. The study was confined to the samples of students drawn from the entire group of students enroled for the B.Ed. degree course in the Faculty of Education and Psychology, Baroda and Government College of Education, Ratnagiri. Peer feedback was used for the critique session for all the three skills for microteaching treatment. Symbolic and audio models only were developed because of the nonavailability of materials like videotape, etc. Primary teachers attending the inservice

courses at the Government College of Education, Ratnagiri were used as students for all the treatments.

The problem under investigation can be described and explained by providing operational definitions of the key terms, namely - modeling, microteaching and skills in questioning.

1. Modeling - Symbolic and audio modeling were used in this study. (vide Appendix IIIa, IIIb and IIIc)

   (a) Symbolic modeling was the transcript of a lesson developed by the investigator depicting the use of a particular questioning skill forming the first independent variable of the study. The students read the script.

   (b) Audio modeling was the audiotaped lesson based on the transcript developed for the symbolic modeling described in (a) above. The students were exposed to the skill by replaying the recorded lesson. This formed the second independent variable of the study.

2. Microteaching - it meant that after having planned a short lesson lasting for seven to ten minutes the teacher trainees taught the lesson to a group of five primary teachers acting as students. The same lesson was retaught nextday to another group of five primary teachers acting as students after replanning in the light of peer feedback provided for immediately after the microlesson was over.

3. Questioning - Three questioning behaviours, namely, probing, convergent, and divergent were operationalized as under :

(a) Probing questions - the teacher was expected to try to -

i) introduce prompts

ii) seek more clarification

iii) refocus the question

(b) Convergent questions - the teacher was expacted to try to ask the pupils to -

i) develop definitions of terms under discussion

ii) give illustrations based on the idea

iii) compare and contrast

(c) Divergent questions - the teacher was expected to try to ask the pupils to -

i) predict from the given data

ii) develop hypothesis from the given data

iii) infer from the given data

iv) reconstruct the statements

1.9.0 Hypotheses of the Study

Treatments, namely - symbolic modeling, audio modeling, and microteaching will have differential effects upon the acquisition of skills in probing questions, convergent questions, and divergent questions. The major hypothesis can be split up as follows -

1. Microteaching will be the most effective treatment for acquiring the skill in asking probing questions, followed by audiomodeling and the symbolic modeling treatment being the least effective of the three.
2. Microteaching will be most effective treatment for acquiring the the skill in asking convergent questions followed by the audiomodeling and the symbolic modeling treatment being the least effective of the three.
3. Microteaching will come out to be most effective treatment for acquiring the skill in asking divergent questions,

followed by the audiomodeling and the symbolic modeling treatment being the least effective of the three.

4. Gain Scores on the classroom performance of the student teachers will not differ under the symbolic modeling, audiomodeling, and microteaching treatments.

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