A STUDY OF THE EFFECT OF TRAINING IN CLASSROOM QUESTIONING BEHAVIOUR OF STUDENT TEACHERS ON TEACHING COMPETENCE, SELF-CONCEPT AND ATTITUDE TOWARDS TEACHING

A SUMMARY
SUBMITTED TO
MAHARSHI DAYANAND UNIVERSITY, ROHTAK
FOR THE AWARD OF
DEGREE
OF
DOCTOR OF PHILOSOPHY
IN
EDUCATION

Supervisor: Dr. P.S. Yadav,
Principal (Retd.), R.L.S. College of Education,
Sidhrawali (Gurgaon)

Investigator: KAVITA
Regn.No.99-SKC-64

DEPARTMENT OF EDUCATION
MAHARSHI DAYANAND UNIVERSITY
ROHTAK
2011
SUMMARY

INTRODUCTION

The seeds of civilization may have been sown in the mind of human being with the birth of first question. The birth of question must have led to the process of thinking and reasoning to unfold the unknown of nature around him. The question, of course, might have made the man hearty. Probably, he could not content himself with one question alone. Each succeeding question must have added to his fund of environmental secrets loaded with germs of civilization. The unending questioning-answering chain, the mother of the present culture and civilization, is still on. It will continue to be so in the times to come as it is the key to cultural enrichment and growth of civilization.

It is clear that question is an instrument of informal education right from the inception of human civilization. A question is a verbal utterance that seeks a response from the person to whom it is directed. It is a means of finding out and interpreting data. However, it is more than a logical grouping of words punctuated by question mark. It’s most important offering is its value for stimulating and directing thinking and reasoning. ‘Questioning is an effective stimulus and it is readily available to classroom teachers’. A well-developed understanding of the components of questioning behaviour as well as skill in using it effectively and judiciously, becomes one of the most valuable tools with which the teacher can assume his responsibilities as a manager of teaching-learning. Effective questioning is not an innate talent that only a few possess; it is a skill that can be developed with continuous practice. It is one of the teacher’s basic tools of communication skill. Realizing the significance of questions, the first formal
teacher might have laid his hand on this powerful tool of learning. The story of great teachers in different cultures bears evidence to this fact. They raised curiosity of the child to explore, discover and invent with the aid of carefully designed teaching-learning situations. They led the children to criterion responses through well designed teaching-learning situations in which questioning constituted the main ingredient. Questions, therefore, provide powerful means of learning, more so in specifically designed formal instructional situations in the classroom.

**SIGNIFICANCE OF THE STUDY**

Various commissions and committees on education in general and teacher education in particular have pointed out the inadequacy of teacher education, especially the student teaching programmes (University Education Commission, 1949; Secondary Education Commission, 1953; the International Team on teachers and Curricula in Secondary Schools, 1954; Education Commission, 1966). The major drawback in our student-teachers programmes is that they do not develop necessary teaching skills among the student teachers. Their teaching competence does not improve because of lack of training in teaching skills (Jangira, 1980).

The Indian Education Commission, 1966 pointed out that the destiny of India is being shaped in her class-room. The emerging shape of the destiny undoubtedly depends on what goes on in the classrooms, and how does it go on? Educational effectiveness is determined by the quality of the teacher pupil transactions in the classrooms in our schools. The quality of classroom transactions in their turn depends upon the quality of teachers and their professional preparation. Questioning is very important teaching skill. Questions can be asked to motivate the students by way of arousing their curiosity, to develop concepts and ideas through systematic probing,
and to review and evaluate the knowledge already learned. Despite the fact that questioning is recognised as a significant tool for classroom instruction, adequate training in questioning is not imparted in our teacher training programmes. Studies have revealed disturbing facts about the quality of questions teachers asked in the classroom. Majority of the questions asked demand simply recall and recognition- the most elementary form of the intellectual process (Smile and Meux, 1962; Adams, 1964; Gallagher, 1965; Davis & Tinsely, 1967; guszak, 1960; Bertolomes, 1969; John 1970, Jangira, 1979). Studies have not revealed conclusive results regarding relationship between teacher classroom questions and student teacher self-concept. Some studies indicate positive relationship between these two variables (Sharma, 1972; Shaida, 1976); while a few studies indicate non-significant relationship (Roy, 1977). Similar are the findings abroad. Rosenshine (1978, 1981) and Winne (1979) have not found positive relationship between teacher classroom questions and student teacher self-concept; whereas Redfiled (1981) has found that higher level questions have a positive effect on student teacher achievement.

Study of trend reports and abstracts in Buch, 1974, 1979, 1984, 1994, 2000 and 2006 reveals that a very few studies have been conducted to investigate the effect of training in classroom questioning on the teaching competence of teachers trainees, self-concept and attitude towards teaching. The present study is an attempt in this direction.

STATEMENT OF THE PROBLEM

A STUDY OF THE EFFECT OF TRAINING IN CLASSROOM QUESTIONING BEHAVIOUR OF STUDENT TEACHERS ON TEACHING COMPETENCE, SELF-CONCEPT AND ATTITUDE TOWARDS TEACHING
OPERATIONAL DEFINITIONS OF TERMS

Definitions of term used in the Classroom Questioning Behaviour Training alongwith respective symbols are given hereunder:

Teacher Behaviour/Activity (TO):

It pertains to student-teachers activity other than Questioning, for example, writing on black-board, reading from the book etc. which would be recorded under this category.

Pupil Behaviour/Activity (PO):

It covers the pupil activity other than response to student-teacher questions like reading from the book, pupil questions etc. which would be recorded under this category.

Question Functions:

Functions of the questions asked in the classroom have been divided into two categories namely Management and Substantive business. Management function of Questions refers to the preparation and management of learning environment in the classroom. Attention of the pupils can be ensured through classroom questions.

Substantive business function of the classroom questions implies communication of content. Thus function can be analyzed into the simple units like (i) Creating a learning set. The Questions for this purpose attempt to link the pupil’s past experience with the new learning task. (ii) Advancing the learning task-this function may occur at any stage of the lesson. (iii) Planned drill and practice which includes the Questions requiring quick and repeated response. (iv) Reviewing the Progress of learning which refers to
the stage in the lesson, where at the end of the unit of the learning task, the progress of the pupils is reviewed. The review questions hold, recapitulating, the learning tasks well as they point to some of the difficulties faced by the pupils. (v) Evaluating the learning task—the evaluating function of the Question corresponds to the final stage of the lesson. This may include some of the questions from development, review and diagnostic stages, but it goes beyond too in the sense that the total teaching-learning strategy is also evaluation in relation to the actual learning outcomes in terms of pupil achievement. Thus, the functions of the classroom questions have been analyzed on the basis of the categories discussed above and coded in their respective columns in the observation sheet.

**Questioning Structuring:**

This category covers relevance, precision, grammatical correctness, and clarity of Questions with the following scope and jurisdiction:-

(i) Relevance (R+, -): It means the suitability of the Questions to the specific instructional objectives of the lesson and the content being covered. The plus and minus signs indicate the relevant and non-relevant nature of the question respectively.

(ii) Precision (P+, -): Precision in the context of classroom question refers to the length of the question. The length of questions should be appropriate to the purpose and level of the question. A precise question should not contain even a single word more than what is essential. The plus and minus signs respectively indicate the precision and lack of precision.
(iii) Grammatical Correctness (Gr +, -): The minds of the pupils can be baffled and confused by grammatically incorrect questions because such questions fail to communicate their intent and also reduce the fluency of Questioning. Therefore, the Questions put to the pupils should be grammatically correct. The plus sign indicates the grammatically incorrectness of a Question.

(iv) Clarity (C+, -): Clarity refers to the easy comprehension and understanding of the Questions. An effective question should not contain terms which are beyond the understanding and comprehension of the pupils. Proper format and the use of familiar vocabulary give clarity to the questions. Plus sign indicates the clarity and the minus sign indicates the lack of clarity.

**Question Level:**

The level of questions is determined by the level of thinking generated by the Question in the pupils. In this category, the different levels of questions according to the thought process generated by them are identified and recorded. Theory levels of classroom questions used in the present study have been identified as given below:

i) **Cognitive-Memory Question (Cm):**

Cognitive-memory questions are limited to the lowest level of thinking. Such questions require the pupils to recall a fact, define a term, identify something he observes or give an answer he has learnt by rote memory. The symbol Cm has been taken for recording this level of question.
ii) Convergent Application Questions (Cv):

Putting up of facts together and constructing of answer is exclusive requirement from pupils answering the questions. Convergent questions involve the person in the overt expression of an expected behaviour and occur in highly structured context in which the parameters governing the response are restricted by the situations. It can be evaluated as correct or incorrect by definition, custom or empirical verification. Consequently, as a correct response to the convergent question, a pupil may be expected to perform the operations of explaining, stating relationships, associating and relating or comparing and contrasting. The observer, after analyzing it has to write (Cv) in the observation sheet. Thus, a response to a convergent question causes all the facts of it to come towards each other and tend to meet a point to exhibit association or comparison or contrast.

iii) Divergent Application Questions (Dv):

Divergent application questions are thought provoking. But the answers to these questions are not necessarily predictable. A pupils responding to a divergent question is led to organise elements into new patterns that were not clearly recognised beforehand. The pupil, while responding to a divergent question, is required to perform the operations of predjecting, hypothesizing or inferring. Reasonableness and unreasonableness of appropriateness and inappropriateness are the yardsticks for evaluating the divergent questions. The response is recorded by writing Dv only.

iv) Evaluation Questions (E):

This is a kind of super level question. These questions require the pupil to organize his knowledge, formulate an opinion, and take a self-
selected position. In order to take a judgement, the pupil must use evidence. He makes a judgement of good or bad, right or wrong, according to standards he sets or someone else sets for him. Laconically, evaluating questions require the pupil to judge, value, justify a choice or depended on a position.

**Question Delivery:**

The effectiveness of student teacher’s questioning utterly depends on the delivery process. Question delivery process includes three components viz. speed, voice, pause which are analyzed on the basis of following criterion:

i) **Speed (S+, -):** It is the time taken in speaking out a question to the pupils in accordance with the function and level of thinking required to answer it. The plus sign indicates appropriateness of the speed and minus sign indicates the lack of it.

ii) **Voice (V+, -):** Voice refers to two dimensions viz. audibility of question to all pupils in the classroom and intonation according to the emphasis to be laid on specific points in the question. The plus and minus signs indicate appropriateness of voice or lack of it respectively.

iii) **Pause (Ps+, -):** This is an interval between delivery of the question and the student-teacher’s calling upon a pupil to answer it. The length of the pause corresponds to the level of question. The plus and minus signs indicate appropriateness or otherwise of the pause.
Question Distribution:

The distribution of classroom questions can be considered on three lines viz. distribution in terms of classroom space, distribution among volunteers and non-volunteers and re-directing the same question to other pupils for increasing and encouraging pupil participation.

i) Space: The first dimension of question distribution is space coverage. Dividing the classroom into four parts would give four quadrants, specified as under:

a) Left Front (L): This quadrant comprises the front rows on the left of the student-teacher.

b) Right Front(R): this quadrant comprises the front on the right of the student-teachers.

c) Left Back (Lb): It comprises the back rows on the left of the student-teacher.

d) Right Back (Rb): It comprises of the back rows on the right of the student-teacher.

ii) Volunteer (V+): volunteer is the pupil who offers for responding to the question voluntarily by raising of hand.

iii) Non-volunteer (V-): Non-volunteer is the pupil who does not come forward to respond to the question voluntarily and is called by the student teacher to respond.
iv) Re-direction (Rd): It is a device applied to ensure encouragement of pupils and to provide opportunity for their active participation in the teaching-learning process.

Pupil Response:

A number of possible responses situations arise at the time when a question is posed in the classroom, namely:

i) No-Response Situation (N): It denotes the failure on the part of the pupils to frame and express verbally a response to the question that they are required to answer. The pupils maintain silence so far as response is concerned.

ii) Wrong Response Situation (W): The response contradictory to criterion response is terms as wrong response.

iii) Incomplete Response (I): Response is given by the pupil but the same is not complete, when judged on the criteria response.

iv) Partially Correct Response (Pr.): The response in which a part only is correct, and the rest may incorrect, is termed as partially correct response.

v) Correct Response (C): The response which completely conforms to the laid down criterion is terms as correct response.

vi) Chorus Response (Ch+,-): The response given by the pupils collectively is termed as chorus response. It is useful for planned drill and practice. But, in other situations, the chorus response come times borders on indiscipline in the classroom. The plus and
the minus signs indicate planned drill and indiscipline respectively in the classroom.

**Response Management:**

Response management consists of acceptance, rejection, promoting, further information and response structuring. Acceptance is denoted through words like right, correct, yes and even praise words like good, go-on etc. Acceptance is also denoted non-verbally through ‘Nod’, smile etc. Rejection is denoted by ‘No’ or ‘through shaking of head. Promoting refers to providing hints to the pupils to structure his incomplete or partially correct response. It is also used to guide pupils’ thinking to lead to criterion response. Further information provides an opportunity to a pupil to improve upon his earlier response. Response structuring refers to the restatement of pupils correct response in such a manner than it becomes laconic.

**TEACHING COMPETENCE**

The term teaching is a complex skill and can be defined as a set of observable teacher behaviours that intend to facilitate learning in the pupils. Teaching is comprised of teaching skill, which have specific instructional objective to be achieved. Therefore, for the purpose of present study, teaching competence is defined as the effective use of various teaching skills intending to facilitate learning in classroom teaching during practice teaching in schools.

The term teaching has been defined in different ways. Competence also has been debatable term. Thus the lack of clarity and agreement about the concept of teaching competence has made its measurement difficult. Of course, the various teacher institutions have their own tools for assessing
teaching competence of student teachers, but there has been no agreement and clarity about such tools. The General Teaching Competency Scale constructed by Passi and Lalitha (1979) was used to measure the teaching competence.

SELF-CONCEPT

There are several items that are virtually synonymous with self-concept, among which are “Self-image”, the “Ego”, “Self-understanding”, “Self-perception” and “Phenomenal Self”.

Self-concept has been referred by lowe (1961) as one’s attitude towards self, and by, Paderson (1965) as an organized configuration of perceptions, beliefs, feelings, attitudes and values which the individual views as a part of characteristics of himself. Rogers (1951) defined self-concept as “an organized configuration of perceptions of the self which are admissible to awareness. It is compared to such elements as the perceptions of one’s characteristics and abilities, the percepts and concepts of the self in relation to others and to the environment, the value qualities which are perceived as associated with experiences and objects, and the goals and ideas which are perceived as having positive or negative valence.”

Saraswat and Gaur (1981) described self-concept as “the individual’s way of looking at himself. It also signifies his way of thinking, feeling and behaving.”

Lynche, norem-Hebeisen and Gergen (1981) have quoted William fitt’s suggestion that attention should be shifted from global measures of the self-concept to configuration of the responses across self-concept dimensions.
Such configurational patterns should be merely sensitive to environmental effects.

To measure self-concept, the Self-concept inventory prepared by R.K.Saraswat was used.

**TEACHING ATTITUDE**

Himmelfarb and Eagly has defined teaching attitude as to refer to any reports of what people think, feel or of the ways in which they intend to act. In this investigation, the investigator has used the “Teacher Attitude Inventory (TAI)” developed by Dr. S. P. Ahluwalia, because teachers attitudes not only affect his behaviour in the classroom but also influence the behaviour of his students. Moreover the effective and productive learning by pupils can be achieved by employing teachers with desirable attitudes or by shaping their attitude in the desired direction. It is a dependable ‘Multidimensional attitude inventory for measuring attitudes e.g. primary and secondary teachers towards teaching profession and its allied aspects. It is believed that it a worthwhile toll for the training institutions not only for diagnostic and prognostic purposes and practicing teachers through favourable attitudes by changing the organizational climate of their classrooms.

It is Likert type instruments of 90 times sub-divided instruments. These sub-scales were developed by the Likert summated rating procedure. Each scale has 15 statements pertaining to a particular aspect of prospective and practicing teachers.
The six aspects of attitude towards:

1. Teaching Profession.
2. Classroom and Teaching.
3. Child-Centred Practices
4. Educational Process
5. Pupils
6. Teachers.

OBJECTIVES

The following specific objectives emerged from the statement of the research problem:

1. To study the initial classroom questioning behaviour of student-teachers in respect of the incidence of questions, structural characteristics of questions, question delivery behaviours, question distribution behaviours, and pupils’ response management behaviours of student-teachers.

2. To study at the end of training the classroom questioning behaviour of student teachers in respect of the incidence of questions, structural characteristics of questions and pupil response management behaviours of student-teachers.

3. To study the change in classroom questioning behaviour of student teachers after classroom questioning behaviour training in respect of incidence of questions, structural characteristics of questions, question delivery behaviours, question distribution behaviours and pupil response management behaviours of student-teachers.
4. To compare the classroom questioning behaviours of student-teachers before and after the classroom questioning behaviours training in respect of incidence of questions, structural characteristics of questions, question delivery behaviours, questions distribution behaviours and pupil response management behaviours of student teachers with student-teachers without such training.

5. To compare the teaching competence of student-teachers with and without classroom questioning behaviour training, before the experimental treatment.

6. To compare the teaching competence of student-teachers with and without classroom questioning behaviour training, after the experimental treatment.

7. To compare self-concept of student-teachers with and without classroom questioning behaviour training, before the experimental treatment.

8. To compare self-concept of student-teachers with and without classroom questioning behaviour training, after the experimental treatment.

9. To compare attitude towards teaching of student-teachers with and without classroom questioning behaviour training, before the experimental treatment.

10. To compare attitude towards teaching of student-teachers with and without classroom questioning behaviour training, after the experimental treatment.
HYPOTHESES

In order to realize the objectives of the study, the following hypotheses were formulated for testing:

H₁ At the end of the experiment the group of student-teachers with classroom questioning behaviour training tend to have higher level of incidence of classroom questions than those without such training.

H₂ The student-teachers undergoing training in classroom questioning behaviour tend to ask more relevant, precise, grammatically correct and clear questions after the training than their counterparts who did not receive such training.

H₃ At the end of the training, the student-teachers in the experimental group tend to ask less number of questions at memory level and more questions at convergent application, divergent application and evaluation levels than their counterparts who did not receive such training.

H₄ The student-teachers undergoing training in classroom questioning behaviour exhibit more appropriate question delivery behaviours (speed, voice and pause) after training than the student-teachers who did not receive such training.

H₅ The student-teachers undergoing training in classroom questioning behaviour tend to exhibit more appropriate classroom questioning distribution behaviours (spacing volunteers and non-volunteers) after training than the student-teachers who did not receive such training.
H₆ At the end of the training in classroom questioning behaviour there is significant difference between pupil response types (no response, wrong response, incomplete response, partially correct response, correct response and chorus response) under the two groups of student-teachers with and without such training.

H₇ The student-teachers undergoing training in classroom questioning behaviour exhibit more appropriate pupils response management behaviours (acceptance, rejection, prompting, seeking further information and pupils’ response structuring) after the training than the student–teachers who did not receive such training.

H₈ There is no significant different in the teaching competence of the two groups of student-teachers with and without training in classroom questioning behaviour, before the experimental treatment.

H₉ There is no significant different in the teaching competence of the two groups of student-teachers with and without training in classroom questioning behaviour, at the end of the experimental treatment.

H₁₀ There is no significant different in the self-concept of the two groups of student-teachers with and without training in classroom questioning behaviour, before the experimental treatment.

H₁¹ There is no significant different in the self-concept of the two groups of student-teachers with and without training in classroom questioning behaviour, at the end of the experimental treatment.

H₁² There is no significant different in the attitude towards teaching of the two groups of student-teachers with and without training in classroom questioning behaviour, before the experimental treatment.
H_{13} \quad \text{There is no significant different in the attitude towards teaching of the two groups of student-teachers with and without training in classroom questioning behaviour, at the end of the experimental treatment.}

**DELIMITATIONS OF THE STUDY**

Keeping in view the time and resources available with the researcher, the study was delimited as under:

1. Although there are various teaching strategies, yet the study confined itself to the Classroom Questioning Behaviour Training to student-teachers only.

2. Teaching-Learning can take place both inside and outside the classroom, but the present study confined itself to the classroom teaching-learning.

3. The study could be conducted on a variety of educational outcomes, but it was conducted on three aspects viz. teaching competence, self concept and attitude towards teaching of student teachers.

4. Although the study could be simultaneously conducted on student teachers of various colleges of Education, yet the student teachers of Dayawanti Memorial College of Education, Pada, Gurgaon; Deen Dayal Rastagi College of Education, Khandewla (Gurgaon); Chetanyadev College of Education, Bohra Kalan (Gurgaon); and Lord Krishna College of Education, Jamalpur (Gurgaon) were taken.

5. The effect of Classroom Questioning Behaviour technique could be studied throughout the academic session, but in the present study the effect was observed for four months only.
SAMPLE

There were 200 Hindi and Social Studies student teachers studying in Dayawanti Memorial College of Education, Pada, Gurgaon; Deen Dayal Rastagi College of Education, Khandewla (Gurgaon); Chetanyadev College of Education, Bohra Kalan (Gurgaon); and Lord Krishna College of Education, Jamalpur (Gurgaon). These student teachers constituted the Sample of the Study. 100 Student teachers of Dayawanti Memorial College of Education, Pada, Gurgaon; Deen Dayal Rastagi College of Education, Khandewla (Gurgaon) were allotted to the Experimental group and 100 student teachers of Chetanyadev College of Education, Bohra Kalan (Gurgaon); and Lord Krishna College of Education, Jamalpur (Gurgaon) were allotted to the Control group.

Below Figure exhibits the sampling plan in control and experimental groups:

TOOLS USED:

The following tools were used to collect data required for the present study:

a. Classroom Questioning Behaviour Observation System (Jangira)

b. General Teaching Competence Scale by Passi & Lalita.
c. Self Concept Test by R.K. Saraswat

d. Teaching Attitude Inventory (TAI) developed by S.P. Ahluwalia.

(a) **Classroom Questioning Behaviour Training (CQBT)**:

Classroom Questioning is multi-dimensional including incidence of questions and the level of thinking which the questions cause in the pupils; structural characteristics on the basis of linguistic aspects; performance dimension covering delivery and distribution of classroom questions. Pupil responses based on delivery and distribution of classroom questions elicit particular type of teacher management behaviour. There dimensions constitute essential components of CQBT. After identifying the elements of CQBT, the desirability dimension of these elements need to be specified. The incidence of questions have no hard and fast domains and it depends upon the nature of content and instructional objectives. Therefore, the instructional situation determines the desirable incidence of questions. It is also worth taking note that thinking generative questions should be asked instead of traditional memory questions. Particularly, the questions which generate higher order thinking should be used in small measure. The position regarding this level of questions is distributing since they have been found to be conspicuous by their absence in studies conducted in India despite the fact that development of higher thinking ability is accepted curricular objective (Jangira, 1980, 1981).

The voice and speed used in putting the question is included in the distribution of classroom questions. Pause is the transitional behaviour between delivery and distribution. The general scheme of using the questions parallels the scheme of teaching. So, this is a scheme of action. The action begins in planning and ends in reflection. It involves fore thought and
afterthought as well. Speed corresponds to the level of questions and the level of the pupil. Voice includes its linguistic characteristics. Designation of questions to the volunteer or non volunteer pupil forms the basis of distribution behaviour. As a general practice only volunteers are called to respond and non volunteers are knowingly or unknowingly pushed is the rear to the extent of their withdrawal from the classroom activity. Management behaviours of teachers e.g. prompting etc. are either totally absent or are sparingly used.

The teacher's use of questioning is a generic scheme, lacking all specifics. It also leads one to appreciate that we act before and after the questioning with thought as well as action. Therefore, the first and most crucial phase of teacher questioning is choosing the questions to ask. The principle of practice is to discipline behaviour in service of purpose in circumstance. This gives rise to three things to take into account as we choose our questions pedagogical purposes, classroom circumstances and questioning behaviours. Choice selects and interrelates all the three. Purposes are particular for the teacher who asks a question. The classroom may be a single place but it is a complex of multiple contexts. Classroom circumstances vary, within one and the same classroom and during the very same lesson. There are hundreds of questioning behaviours to choose from. To specify the choice among questioning behaviours, the generic question identified for each behaviour is addressed. It involves the usage, quantity, kind, content, form, timing, manner, presumptions and purpose. Manner, specifically speaking, involves the tone and attitude conveyed, The Voice diction, inflection and other aspects of delivery, as well as the non verbal aspects such as proximity to respondent, facial gestures etc. A smooth conversational manner may be useful, or loud and clear may be called for. The teacher may gaze relaxedly about the room or stare intently at a given
student. The operational behaviours constituting various dimensions of classroom questioning, along with direction of desirability specified above, should be incorporated in the proposed training in classroom questioning for the study. Jangira (1979) designed classroom questioning behaviour of teachers (Appendix A) for the purpose of providing feedback and the operational behaviours were categorized. The sample observation sheet for recording the classroom questioning behaviour of student teachers was used.

(b) General Teaching Competence Scale (GTCS)

The term teaching has been defined in different ways. Competence also has been debatable term. Thus the lack of clarity and agreement about the concept of teaching competence has made its measurement difficult. Of course, the various teacher institutions have their own tools for assessing teaching competence of student teachers, but there has been no agreement and clarity about such tools. The General Teaching Competence Scale constructed by Passi and Lalitha (1979) (Appendix ‘B’) has been used to measure the teaching competence of student teachers of the sample.

Description of General Teaching Competence Scale (GTCS)

There are 21 items related to 21 teaching skills, which encompass the entire teaching-learning process in the classroom. They are related to five major aspect of classroom teaching namely, Planning, Presentation, Closing, Evaluation and Managerial. The items are such that they are centred teacher classroom behaviour in relation to pupil behaviour. The various teaching skills included are related to objectives of the lesson, content selection, content organisation selection of audiovisual materials (planning skills) introducing the lesson, fluency of questions, use of probing questions, explaining, illustrating with examples, stimulus variation, use of silence and
pacing use of blackboard (presentation skills), achieving closure giving assignment (closing skills), classroom evaluation, diagnosis of pupil difficulties (evaluation skills), recognizing attending behaviour and maintaining classroom discipline (managerial skills). The GTCS is a 7-point scale measuring the use of skill by the teacher in the classroom corresponding to each item ranging from ‘1’ for ‘not at all’ to ‘7’ for ‘very much’. This distribution of the various items related to the different classification of teaching skills is given in table below:

Table: Distribution of items in different Classification of Teaching Skills

<table>
<thead>
<tr>
<th>Classification of Teaching Skills</th>
<th>No. of items</th>
<th>Sr. No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>04</td>
<td>01 to 04</td>
</tr>
<tr>
<td>Presentation</td>
<td>11</td>
<td>05 to 15</td>
</tr>
<tr>
<td>Closing</td>
<td>02</td>
<td>16 to 17</td>
</tr>
<tr>
<td>Evaluation</td>
<td>02</td>
<td>18 to 19</td>
</tr>
<tr>
<td>Managerial</td>
<td>02</td>
<td>20 to 21</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

Reliability of the Scale

This scale has been used for doctoral research (Joshi, 1977; Passi, 1977) and the reported inter-observer reliability coefficient’s range from 0.85 to 0.91. Inter-observer reliability can be better established when the observers train themselves for using the General Teaching Competence Scale.

Validity of the Scale

The scale has content validity since at every stage of its development; discussions were held with teachers and teacher educators with regard to the different teaching skills included and their behavioural components.
(c) Self-concept

The inner image of the man is known as "Self", it is defined as the perception by the individual of his own inner feelings. There are many terms that are virtually synonymous with self-concept among which are ‘self image’, the ‘ego’, ‘self-understanding’, ‘self-perception’ and ‘phenomenal-self’.

Self-concept has been referred by Lowe (1961) as one’s attitudes towards self, and by Paderson (1965) as an organised configuration of perceptions, beliefs, feelings, attitudes and values which the individual views as a part of characteristics of himself. Rogers (1951) defined self-concept as, “an organised configuration of perceptions of the self which are admissible to awareness. It is compared to such elements as the perceptions of one’s characteristics and abilities, the percepts and concepts of the self in relation to others and to the environment, the value qualities which are perceived as associated with experiences and objects, and the goals and ideas which are perceived as having positive or negative valence.”

Saraswat and Gaur (1981) described self-concept as “the individual’s way of looking himself. It also signifies his way of thinking, feeling and behaving.” Lynche, Norem-Hebeisen Gergen (1981) have quoted William Fitt’s suggestion that attention should be shifted from global measure of self-concept to configuration of the responses across self-concept dimensions. Such configurational patterns should be merely sensitive to environmental effects.

In the present study the behaviour of the adolescent with its own peculiar characteristics and problems has been examined after deep
penetration into their perceptions, their physical and social temperaments, educational and intellectual spheres of self-concept. The self-concept dimension measured under the present study of self-concept are physical, social, intellectuals, moral, educational and temperamental self-concept To measure self-concept, the Self-Concept Inventory prepared by R.K. Saraswat was used. (Appendix-‘C’). Each item is provided with five alternatives. Responses are obtained on the test booklet itself. There is no time limit but generally 20 minutes have been found sufficient for responding to all the items.

**Instructions to the Students:**

This is a self-concept inventory. There are 48 items in it. Against each item, there are five responses. Every student is to read each item carefully and respond it to it by marking a tick (√) on any one of the five responses given against that item which they think proper.

There is no right or wrong answer. The right answer is only what you feel about yourself. A student is required to respond according to what he/she feels about himself/herself with reference to that statement. His/her answers will be kept confidential.

After giving these instructions, the researcher had explained one example given in the inventory.

**Scoring:**

The respondent is provided with five alternatives to give his responses ranging from most acceptable to least. The alternative and responses are arranged in such a way that the scoring system for all the items will remain the same i.e. 5,4,3,2, and 1 whether the items are positive or negative. If the respondent puts tick mark (√) for first alternative, the score is 5, for second
alternative the score is 4, for third alternative the score is 3, for the fourth it is 2 and for the fifth and the last alternative the score is 1. the summated score of all the 48 items provides the total self-concept score of an individual. A high score on this inventory indicates a high self-concept, while the low score shows the low self-concept.

Reliability

Reliability of the inventory was found by test, re-test method and it was found to be 0.91 for the total self-concept measure. Reliability coefficient of its various dimensions varies from 0.67 to 0.88.

Validity

Expert opinions were obtained to establish the validity of the inventory. 100 items were given to 25 psychologists to classify the items to the category to which it belongs. Items of highest agreement and not less than 80% of agreement were selected. Thus the content and construct validity were established.

(d) Teachers Attitude Inventory (TAI)

In this investigation, the investigator has used the “Teacher attitude Inventory (TAI)” developed by Dr. S. P. Ahluwalia (Appendix-'D') , because teachers attitudes not only affect his behaviour in the classroom but also influence the behaviour of his students. Moreover the effective and productive learning by pupils can be achieved by employing teachers with desirable attitudes or by shaping their attitude in the desired direction. It is a dependable ‘Multidimensional attitude inventory for measuring attitudes e.g. primary and secondary teachers towards teaching profession and its allied aspects. It is believed that it a worthwhile toll for the training
institutions not only for diagnostic and prognostic purposes and practicing
teachers through favourable attitudes by changing the organizational
climate of their classrooms.

It is Likert type instruments of 90 times sub-divided instruments. These sub-scales were developed by the Likert summated rating procedure. Each scale has 15 statements pertaining to a particular aspect of prospective and practicing teachers.

The six aspects of attitude towards:

1. Teaching Profession.
2. Classroom and Teaching.
3. Child-Centred Practices
4. Educational Process
5. Pupils
6. Teachers.

Originally, 300 attitude statements, 50 on each sub scales were collected from diverse sources, 180 attitudes statements consisting of 30 on each subscales were discussed in a small group and only 150 attitude statements, 25 on each sub scales were retained and formed the preliminary form of the teacher attitude inventory. The ‘t’ value of each attitude statements was found by using the Edwards formula and finally keeping the rationale of attitude scale construction in view 90 psychometrically “good” attitude statements, 15 on each sub-scale, were selected to constitute the final form of the teacher attitude inventory.

Out of the 90 items, 56 are in positive declarative form and 34 of them are in negative form. Again 43 items are meant to assess attitude in favourable direction and 47 in unfavourable direction. This favourable unfavourable continuum adequately measure the above mentioned six
selected areas. The teacher attitude inventory consists of a bilingual (English and Hindi) reusable test booklet with a separate answer sheet.

The details of the favourable (F) and unfavourable (UF) items and their scale wise serial numbers are given below:

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Type</th>
<th>Serial/Item No</th>
<th>Total No. of item</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>F</td>
<td>1, 8, 20, 23, 41, 66, 85</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>13, 14, 46, 48, 60, 72, 79, 86</td>
<td>8</td>
</tr>
<tr>
<td>II.</td>
<td>F</td>
<td>2, 9, 14, 17, 42, 47, 53, 67</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>35, 38, 59, 61, 65, 73, 84</td>
<td>7</td>
</tr>
<tr>
<td>III.</td>
<td>F</td>
<td>3, 11, 16, 21, 27, 39, 49, 62, 64, 80</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>25, 54, 75, 83, 90</td>
<td>5</td>
</tr>
<tr>
<td>IV</td>
<td>F</td>
<td>15, 28, 36, 43, 50, 53, 71, 87</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>4, 7, 10, 32, 74, 63, 76</td>
<td>7</td>
</tr>
<tr>
<td>V</td>
<td>F</td>
<td>5, 44, 81, 82, 89</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>18, 22, 29, 31, 37, 51, 56, 58, 70, 77</td>
<td>10</td>
</tr>
<tr>
<td>VI</td>
<td>F</td>
<td>6, 23, 40, 52, 88</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>UF</td>
<td>12, 19, 24, 26, 30, 45, 57, 68, 69, 78</td>
<td>10</td>
</tr>
</tbody>
</table>

This teacher attitude inventory prepared by Dr. S.P. Ahluwalia consisting of 90 attitude statements has both positive and negative items. Like a Likert type of 5 point scale this instrument is highly reliable. Likert continuum strongly agree, agree, undecided, disagree, and strongly disagree has been provided in this inventory. The subject response to each item by putting a tick (✓) in the bracket of the chosen alternative against the serial number of attitude statements and the subject is required to respond all the items. The scale and their weightage system for the scoring is as follows:

<table>
<thead>
<tr>
<th>Scales</th>
<th>Positive/Favourable</th>
<th>Negative/Unfavourable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree (SA)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Agree (A)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Undecided (U)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>--------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Disagree (D)</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Strongly Disagree (SD)</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

The attitude score of a subject is the sum total of items scores of all the six subscales. The theoretical range of scores is from 0 to 360 with higher and lower scores indicating unfavourable attitude towards teaching and allied aspects.

**Reliability of the Inventory**

The teacher attitude inventory is highly reliable. The reliability was highly estimated by the odd even method and found to range from 0.79 corrected upto (0.88) to 0.54 (Rational Equivalence KR 21). Even the test retest reliability coefficients were found to be 0.59 and 0.64 after interval of 3 months and 9 months.

**Validity of the Inventory**

The teacher attitude inventory appears to have content validity (compared with the scores of MTAI developed by Dr. M. C. Joshi. The obtained correlation coefficients for prospective teachers were found to be positive. Separately on the six factors, the correlation coefficient between scores on TAI and MTAI have been ranging from + 0.42 (on factor I) to + 0.02 (on factor III) and _ 0.23 (total) It is

+ 0.42 on factor I
+ 0.32 on factor II
+ 0.02 on factor III
+ 0.27 on factor IV
+ 0.23 on factor V
+ 0.07 on factor VI
+ 0.23 in total
The high discriminating power of the items is a testimony of its internal consistency. The TAI is used in preference to other inventories as it has reasonably high reliability and validity. The TAI is such as a quite adequate scale for measuring attitudes towards teaching profession, classroom, educational process, attitude towards pupils and teachers. It is an inventory easy to administer and scores.

**Procedure for Data Collection**

The researcher followed the following procedure for data collection:

**(a) Observer Training:**

The investigator and ten other observers were trained in using the General Teaching Competence Scale (GTCS) for observation of student teachers lessons. It continued till the inter observer reliability was worked out using Scotts Co-efficient of Agreement of .80 and above was attained. The reliability indices were .80, .81, .85 and .87 which were considered reasonable for observation of GTCS.

**(b) Grouping:**

The sample of 200 student teachers was divided into two groups of 100 students each and, thus, the two groups were randomly assigned the experimental and control groups. Group A was assigned to the experimental group and group B was assigned to the control group. The control group treatment is, as a matter of fact, no treatment meaning thereby that this group was held apart for measurements only and no specific deliberate treatment was given. It existed for comparing classroom questioning behaviour of experimental treatment comprising the classroom questioning behaviour training.
(c) Observation before Training:

The observers observed two lessons of 35 minutes duration of each of the 200 student teachers selected for the study. The classroom Questioning Behaviour System was employed for observation. The teaching competence of each student teacher was measured by using GTC Scale. The pretests including the Self Concept Test and Attitude towards teaching were administered to the student teachers by the investigator with the assistance of other observers. This observation was recorded for two weeks.

(d) Training Input:

The experimental group A consisting of 100 student teachers was trained in classroom questioning for a period of four weeks. Orientation of student teachers to various facets of the classroom questioning behaviour was also included in the training. Practice in performance behaviours was also provided to them.

(e) Post-training observations:

After imparting classroom questioning behaviour training the student teachers were allotted to different secondary schools for practice teaching. The allotment of schools was made in such a way that in one school there were student teachers of one group i.e. either of experimental group or of the control group.

Thus, teaching practice continued for four weeks. Thereafter, two lessons each of the student teachers in the control and experimental groups were observed using classroom questioning behaviour observation system (CQBOS) and General Teaching Competence Scale. The observations were conducted for two weeks. The self concept test and Attitude towards
teaching scale were administered to both the groups at the post test stage to measure the self concept and attitude towards teaching of the student teachers.

STATISTICAL ANALYSIS

For testing the significance of difference between classroom questioning behaviour variables and teaching competence scores of the control and experimental groups of student teachers ‘t’ test (Popham, 1967) was employed on the pre-observation scores, post-observation scores and gain scores. The pre-test, post-test and mean gain scores of student teacher under control and the experimental group for Self Concept and Attitude towards teaching were also computed by using ‘t’ test.

FINDINGS

The findings of the present research can be placed in two categories because two broad aspects have been studied in this venture. The first category covers the findings pertaining to the effectiveness of CQBT which was measured in terms of change in the classroom questioning behaviour of student teachers. The second category includes findings pertaining to enhancement in teaching competence, self concept and attitude towards teaching of student teachers.

1. **Effectiveness of CQBT:**

   Following are the main findings drawn by the researcher with regard to the effectiveness of CQBT:

   1. The Classroom Questioning Behaviour Training helps in increasing the incidence of classroom questions as is clear from the significant
difference at 0.01 level of significance in the scores of the control and the experimental groups.

2. The Classroom Questioning Behaviour Training helps to improve the structural characteristics e.g. relevance, precision, grammatical correctness and clarity, of questions used by the student teachers in the classroom.

3. There is no effect of CQBT on the incidence of classroom questions at memory level, because there was found no significant difference between the scores of the control and the experimental groups.

4. CQBT was found effective in increasing the incidence of questions at levels higher than cognitive memory level i.e. at convergent, divergent and evaluation levels. Thus, CQBT has been found as an effective teaching model.

5. The study has revealed that CQBT improves the delivery behaviour of student teachers pertaining to classroom questions. Significant effect was found on speed, voice and pause of student teachers who underwent training in classroom questioning behaviour as compared to those who did not undergo such training.

6. The CQBT helps in improving the question distribution behaviour of student teachers with regard to space, volunteers and non-volunteers.

7. The CQBT improves the pupil response patterns in the experimental groups as compared to the control group.

8. The pupil response management behaviour viz. acceptance, rejection, prompting and seeking further information etc., of student teachers
was found as improved through CQBT. Adequate and appropriate management of pupils' response helps in enhancing the percentage of correct responses in the classroom.

2. **Enhancement of Teaching Competence, Self concept and Attitude towards Teaching of Student Teachers:**

The present study has brought out the following findings with regard to Enhancement of Teaching Competence, Self concept and Attitude towards Teaching of Student Teachers who underwent CQBT.

1. CQBT helps in enhancing the teaching competence of student teachers of the experimental group as compared with the control group of student teachers.

2. CQBT helps in enhancing the self-concept of student teachers of the experimental group as compared with the Student Teachers of control group.

3. CQBT helps in enhancing the Attitude towards Teaching of student teachers of the experimental group as compared with the Student Teachers of control group.

The above findings lead to several manifestations. The CQBT makes it possible to modify classroom questioning behaviour of student teachers along the desired lines. Also, CQBT improves teaching competence, self concept and attitude towards teaching of student teachers.

**CONCLUSIONS**

A close analysis of the results indicates that the experimental group student teachers asked more questions in their classroom as compared to the
control group. It is also shown by these tables that the level of questions asked by the experimental group was higher as compared to the level of questions asked by the control group. The Control group asked more questions at cognitive memory level whereas the experimental group asked more questions at convergent, divergent and evaluation levels, which generate more thinking. The experimental group improved the structural qualities of their questions after CQBT more significantly than the control group. The CQBT was also found helpful in sharpening the delivery of classroom questions as also in improving the question distribution behaviour of student teachers. CQBT equally helped to improve pupil response management behaviour of student teachers. The CQBT was found to be a better strategy, than the conventional programme, of student teaching as teaching competence of student teachers was enhanced after CQBT. It was also found that CQBT was not only effective in improving the classroom questioning behaviour of student teachers, but it also helps in improving their self-concept and attitude towards teaching. The overall assessment points towards the ultimate effectiveness of CQBT and it provides a model for validation of teacher.

**EDUCATIONAL IMPLICATIONS**

The present research has its implications on various categories in the field of education as detailed below:

1. **Implications for Teachers Educators**

   The researcher has found in the present study that CQBT was effective in modifying classroom questioning behaviour of student teachers. Therefore, if included in the prescribed courses for Teacher Education at pre-service level, CQBT can serve as an effective strategy based on systematic
feedback. Classroom questioning behaviour of student teachers can improve remarkably in case they possess prior knowledge about different levels of classroom questions, structural characteristics of classroom questions, distribution behaviour and pupil response management behaviours.

The CQBT is also cost-effective because it employs only human resources and it has no dependence on sophisticated mechanical gadgets in the classroom.

CQBT is again very useful strategy for training at in-service level. It can be included as a part of the orientation courses for exposing extension workers to the operational programmes of Classroom Questioning Behaviour Training. Thus, CQBT is very helpful for enhancing teaching competencies of in-service teacher educators.

2 **Implications for Teachers:**

CQBT helps the student teachers to know how to strengthen their questioning behaviour and how to enhance their teaching competencies. CQBT also provides sufficient knowledge to student teachers how to manage the pupil response effectively in the classroom.

**SUGGESTIONS FOR FURTHER RESEARCH**

1. The present study is limited to pre-service teachers only. Research needs to be conducted to study the effectiveness of CQBT on in-service teachers. Jangira and Dhoundyal (1981) found CQBT very effective when they conducted such study on a small group of ten in-service teachers.
2. The present study has been conducted on a large group of pre-service teachers. It is worthwhile to conduct such study on a small sample of pre-service teachers.

3. The present study has examined the effect of CQBT on pupil achievement only. Another study can be conducted to find out the effect of CQBT on pupil creativity and their personality adjustments.

4. The researcher employed pretest post-test control group design. Other researchers may find it fruitful if they conduct study on the same variables by applying Solomon Four Group design which has two control and two experimental groups. This may provide for external validity factors and may add to the generalisation aspects. Interaction effects of testing are also controlled in this design.

5. The present study has focused on pupil response management. Another hypothesis can be formulated wherein a researcher is to confront with the problem of defining qualitative differences in pupil responses. This is one of the important unsolved problems in the study of teachers' questioning behaviours. Although the present study has concentrated much on higher cognitive questions, yet not much is known about what constitutes good answers to higher cognitive questions. A study in this regard can be conducted keeping the following criteria as possibilities: (a) Complexity of the response; (b) use of data to justify or defend the response; (c) plausibility of the response; (d) originality of the response; (e) clarity of the phrasing; and (f) the extent to which the response is directed at the question actually asked.

6. The present study is primarily based on teacher questions. But, some educators contend that our attention should be focused on questions
asked by students rather than on teachers' questions (Carner, 1963; Wellington & Wellington, 1962). It may, therefore, be worthwhile to conduct a study on the frequency and quality of students' questions in the context of classroom interaction. While investigating student questions in the classroom, the researchers may also undertake to investigate the types of question students ask and the types of question which students should be encouraged to ask.

7. It may be fruitful to conduct a study on other programmes for improving teachers' questioning behaviour. Shaver and Oliver (1964) trained teachers in the use of questioning methods appropriate to discussion of controversial issues in the social science.

8. Continuity of observation duration was a prime factor in the present study. Another study can be conducted to find the effect of CQBT on teaching competencies and pupil achievement by spreading the experiment on varying time gaps. This would throw light on the aspect of sustainability of the impact of the experiment.

9. The scope of CQBT may be extended to a large number of pre-service teachers. This would help to ascertain ideal group size for maximum effectiveness of CQBT.

10. The present study concentrates on training of teachers on classroom questioning behaviour. It would be of great interest to conduct a study on the training of students in classroom question Asking skills.

11. State procedures for certifying teachers have had their main purpose of excluding the incompetent teachers. Achievement of this purpose has been hampered by a lack of valid procedures for discriminating competent teachers from incompetent ones. A study may be conducted
on CQBT as Teacher Education Programme to produce only teachers who have demonstrated competency. The present study is based on the assumptions and/or hope that this approach deserves serious consideration with regard to such a certification system that is based on demonstrated competence.

12. In the present study the effect of CQBT has been observed on 9th class students only. It may be worthwhile to conduct such study at primary level and higher education level.

13. Training in classroom questioning behaviour increases pupil participation in classroom interaction. Socio-metric studies on the comparative pupil participation before and after the training are likely to provide functionally useful data.

14. The present study examined the effect of CQBT on Hindi and Social Science. Similar studies may be conducted to examine the effectiveness of CQBT on physical science and mathematics.

15. The present study has been conducted keeping in view the four levels of questions i.e. Cognitive memory, convergent, divergent and evolution levels. Another study may be conducted to improve teachers' questioning techniques through the use of classroom Question Classification System.

16. Research on pupil questioning may yield rich results if it is studied in the context of what goes on in the classroom before and after the questions. This should include the study of both the cognitive and effective variables.