EFFECT OF CLASS ROOM QUESTIONING BEHAVIOUR TRAINING ON GENERAL TEACHING COMPETENCY OF SCIENCE STUDENT-TEACHERS

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Introduction:

The seeds of civilization might have been sown in the mind of man with the birth of the first question. The birth of the question must have led to the process of thinking and reasoning to unfold the mysteries of nature surrounding him. The sweaty question, of course, might have made the man lusty. Probably, he could not content himself with one question alone. Each subsequent question must have added to his fund of environmental secrets pregnant with germs of civilization. The eternal questioning-answering chain, the mother of the modern culture and civilization, is still on. It will continue to be so in the times to come, because it is the key to cultural enrichment and growth of civilization.

The process of questioning-answering is the key to enculturation and encivilization. The developmental mode of the child best illustrated this process. As soon as the child lands into a new environment, the varied stimuli raise a stream of questions in his mind. He looks and fiddles around to seek answers to these questions. What is this object lying by his side? He explores the mother, the life giving object, her geography particularly the source of milk. Gradually, he explores further—her voice, gestures and movements. The process continues with other persons and objects in his environment through different sensory perceptions and corresponding reactions. The life of the child, rather the man himself, can be best described as an eternal questioning-answering chain exemplifying the seeker in him which leads to self actualization through cumulative learning. What a powerful means of learning for the human beings! The real key to civilization indeed.

Importance of the Study

The destiny of India is being shaped in her class-room (Education Commission, 1966). 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. The quality of classroom transactions in their turn depends upon the quality of teachers and their professional preparation. 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 science student teachers. Their teaching competence does not improve because of lack of training in teaching skills (Jangira, 1980).

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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 ask in the classroom. Majority of the questions ask 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).

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

Objectives:

1. To study the initial classroom questioning behaviour of Science 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 Science student-teachers.

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

3. To study the change in classroom questioning behaviour of science 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 Science 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 science student teachers with student-teachers without such training.

5. To compare the teaching competence of Science student-teachers with and without classroom questioning behaviour training.

Hypotheses

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

H₂ The Science 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 do not receive such training.

H₃ At the end of the training, the Science 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 do not receive such training.
The Science student-teachers undergoing training in classroom questioning behaviour exhibit more appropriate question delivery behaviours (speed, voice and pause) after training than the Science student-teachers who do not receive such training.

The Science 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 Science student-teachers who do not receive such training.

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 Science student-teachers with and without such training.

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

The teaching competence of the two groups of Science student-teachers with and without training in classroom questioning behaviour do not differ significantly at the end of the experiment.

Delimitations of the Study
Keeping in view the time and resources available with the researcher, the study will be delimited as under:

1. Although there are various teaching strategies, yet the study will be confined to the Classroom Questioning Behaviour Training.
2. Teaching-Learning can take place both inside and outside the classroom, but the present study will be confined itself to the classroom teaching-learning.
3. The study could be conducted on a variety of educational outcomes, but it will be conducted on teaching competence of science student teachers.
4. Although the study could be simultaneously conducted on science student teachers of various colleges of Education, yet the science student teachers of Dayawanti Memorial College of Education, Pada, Gurgoan, Haryana were taken.
5. The effect of Classroom Questioning Behaviour technique could be studied throughout the academic session, but in the present study the effect will be observed for three months only.
6. The effect of Classroom Questioning Behaviour Training and conventional Training will be studied in the case of Science student teachers only.

Sample: There were 40 Teaching of science student teachers studying in Dayawanti Memorial College of Education, Pada (Gurgaon) and R.L.S. College of Education, Sidhrawali (Gurgaon). These student teachers constituted the Sample of the Study. 20 Student teachers of Dayawanti Memorial College of Education, Pada (Gurgaon) were allotted to the Experimental group and 20 student teachers of R.L.S. College of Education, Sidhrawali (Gurgaon) were allotted to the Control group.

There were 40 Science student teachers studying in Dayawanti Memorial College of Education, Pada, Gurgoan and 40 science students teachers studying in RLS College of Education, Sidhrawali. These science student teachers constituted the Sample of the Study.

Tools to be Used:
The following tools were used to collect data required for the present study:
1. General Teaching Competency Scale (Passi & Lalita)
Classroom Questioning Behaviour Observation System (Jangira)

Classroom Questioning Behaviour Training (CQBT)

Classroom Questioning is multidimensional 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. 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 relaxed 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 for the purpose of providing feedback and the operational behaviours were categorised.

**The Observation System in Action:**

The column of the observation system gives the category and the horizontal dimension represents an interval of ten seconds. The management and business functions of the classroom, volunteer and non-volunteer distribution behaviour, pupil response, and response management are recorded by tick marking against the category. The Plus (+) or minus (-) signs are used in question structuring and question delivery depending upon the appropriateness of inappropriateness of the category being recorded. The symbol of the category for a particular behaviour is recorded in the case of question level and space-wise question distribution. The recording is done at an interval of ten seconds. For time estimate, sign is recorded every ten seconds if there is no change in the category of behaviour.

**Procedure for Data Collection:**

The researcher followed the following procedure for data collection:

**Observer Training:**

The investigator and three other observers will be trained in using the classroom questioning Behaviour Observation System (CQBOS) for recording classroom questioning behaviour of science student teachers. 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 coding the questioning behaviour. Inter observer reliability of .85 will be attained for using the Teaching Assessments Battery Form 'O' which provided a measure for teacher competency.

**Grouping:**

The sample of 40 science student teachers will be divided into two groups of 20 students each and, thus, the two groups will be randomly assigned the experimental and control groups Group A will be assigned to the experimental group and group B will be assigned to the control group. The control group treatment is, as a matter of fact, no treatment meaning thereby that this group will be held apart for measurements only and no specific deliberate treatment will be given. It will exist for comparing classroom questioning behaviour of experimental treatment comprising the classroom questioning behaviour training.

**Observation before Training:**

The observers will observe two lessons of 35 minutes duration of each of the 40 science 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 Teaching competency Scale by Passi and Lalita. This observation was recorded for two weeks.

**(d) Training Input:**

The experimental group A consisting of 20 science student teachers was trained in classroom questioning for a period of three weeks. Orientation of science 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 science 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 science 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 science student teachers in the control and experimental groups were observed using classroom questioning behaviour observation system. (CQBS) and Teaching competency Scale by Passi and Lalita. The observations were conducted for two weeks.

Statistics Used:
For testing the significance of difference between classroom questioning behaviour variables and teaching competence scores of the control and experimental groups of science 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 science student teachers under control and the experimental groups were also computed by using `t’ test.

Finding

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 of student teachers.

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 to improve the structural characteristics e.g. relevance, precision, grammatical correctness and clarity, of questions used by the student teachers in the classroom.

2. 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.

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

4. 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.

5. 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.

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.

**Enhancement of Competence of Student Teachers**

The present study has brought out that CQBT helps in enhancing the teaching competence of student teachers of the experimental group as compared with the control group of student teachers. Thus 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 of student teachers.

**EDUCATIONAL IMPLICATIONS**

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

The researcher has found in the present study that CQBT was effective in modifying classroom questioning behaviour of student teachers. 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.

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.

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