CHAPTER VI

SUMMARY AND CONCLUSIONS
This chapter presents the Summary of the research study, which includes the brief restatement of problem and procedures used for conducting the research study. This is followed by the major research findings, conclusions drawn from the research findings and implications of the study. It also suggests the areas in which further research can be conducted. The brief summary and conclusions of the research study are given in the following pages:

6.1 INTRODUCTION

It is the beginning of the 21st century and thoughts are being focused on the projections and preparations for the future. When the developments in the last century are reviewed and look for the most important - many inventions and breakthroughs pass in succession before the mind's eye - the emergence of nuclear science, the invention of computer; the spectacle of space technology; the breakthrough in biological sciences, the advances in electronics and many more. Each one of them has and will continue to open immense possibilities for human progress. Nevertheless, the last century will be remembered more than any other, for the emergence of knowledge as a resource and the unparalleled importance that education has assumed in the life of a nation. And in the present century also if we want that this education grows, we need a perfect system of education which must be open & flexible, direct & realistic, broad-based, easy accessible & learning-centred.

It is unfortunate that many student teaching institutions have failed in their duty of providing effective and challenging teachers to cope with the pedagogy that neither
enables them to integrate relevant information with the process of teaching and learning nor it energies its personals by the head, heart and hand. The reason for this may be that in existing student teaching programme, the main emphasis is on the theoretical aspects rather than on the practical ones. There is lack of teaching learning situations to which student teachers are exposed. So the demand of time is to shape and strengthen the basic teaching techniques and providing sound feedback to make competent teachers i.e. it needs a sea change in the input, process and output of the system improving and attending to its feedback system.

Feedback is being traditionally used in our educational institutions but the way in which it is being used lacks in ‘pointed ness’. It is really immediate. In microteaching approach there is provision for immediate and specific feedback to be provided to the trainees undergoing practice in the demonstration skill. Specific and immediate feedback helps the student teachers to proceed in the desired direction and thus facilitates acquisition of the demonstrated teaching skill.

Feedback may take many shapes & styles depending upon its sources, and the time as well as mode of providing such feedback. Feedback on the basis of Sources of Feedback is classified into three categories i.e. Self Feedback, Feedback Provided by Others and Mechanical Feedback. **Self Feedback** is that feedback which is provided by the individual or the system itself for self-correction and improvement. In **Feedback provided by others**, the feedback is provided by other than self like peers, colleagues, co-workers, pupils, teachers and supervisors etc. It is further sub classified into three broad categories i.e. Supervisor Feedback, Peer Feedback & Student Feedback. In **Mechanical Feedback**, feedback is provided through some mechanical means like video-audio tapes, teaching machine & computers. This type of feedback is further sub classified into two broad categories i.e. Audio Feedback & Video Feedback. In **Audio Feedback** the lesson of the student teacher is recorded with the help of audio tape recorder or similar device. If the student teacher listens
the lesson alone and derives the self-feedback then the type of feedback is known as **Audio-self Feedback**. If the student teacher listens the lesson in association with supervisor and receives the feedback from supervisor then the type of feedback is known as **Audio+Supervisor Feedback**. In **Video Feedback** the lesson of the student teacher is recorded with the help of video tape recorder, video camera or similar device. If the student teacher views & listens the lesson alone and derives the self-feedback then the type of feedback is known as **Video-self Feedback**. If the student teacher sees & listens the lesson in association with supervisor and receives the feedback from supervisor then the type of feedback is known as **Video+Supervisor Feedback**.

### 6.2 STATEMENT OF THE PROBLEM

The main thrust of the study is to determine the effect of different types of feedback in the development of teaching skills & improvement in general teaching competence of the student teachers using microteaching as a feedback device. More specifically problem may be stated as under:

"Effect of different types of Feedback on Teaching Competence of Student Teachers."

### 6.3 JUSTIFICATION OF THE STUDY

At present in the teacher training institutions, the prospective teacher, after a few lectures on the principles of teaching and model lesson, are thrown into the classroom and it is in the actual teaching situations that he picks up some idea of how to teach and that too at the expense of 30 or 40 students during the limited period of his teaching practice. The
rationale behind it is that from the very beginning we believe that the student teacher is endowed with skills of teaching. This results in a vague understanding on the part of student teachers, which further results in a low extent of improvement in their teaching competence.

Therefore, at the stage of pre-service teacher training programme, proper feedback will have the desired effect on the competence of student teachers. That’s why the student teachers should be given feedback for the knowledge and development of teaching skills so that competence becomes an integral part of the teaching profession.

All this needs a wider programme for practice in ‘Student Teaching,’ which means more schools centred around the teacher training institutions. But this demand cannot be easily met because not only the number of the co-operating schools for ‘Student Teaching’ are few, but also some of the neighbouring schools even refuse to allow the teacher trainee’s to handle their classes. To meet with such difficulties and to improve the existing programme of training for ‘Student Teaching’, improvement in the teaching competence of the student teachers is needed with the help of suitable type of feedback using an appropriate feedback device.

6.4 OBJECTIVES OF THE STUDY

1. To find out the impact of the knowledge of skills of teaching on general teaching competence of student teachers.

2. To assess the effect of knowledge of components of skills of teaching on general teaching competence of student teachers.

3. To ascertain the relationship between efficiency of using the five selected teaching skills and general teaching competence with different types of feedback.

4. To find out the effect of different modes of feedback on general teaching competence of student teachers.
5. To find out the relationship between cognitive based competence and performance based competence of student teachers.

6.5 HYPOTHESES OF THE STUDY

1. There is no impact of the knowledge of skills of teaching on general teaching competence of student teachers.

2. There is no effect of knowledge of components of skills of teaching on general teaching competence of student teachers.

   There is no effect of knowledge of components of skills of teaching on general teaching competence of student teachers with respect to:

   2.1 Domain: Knowledge of components of Teaching Skills

   2.2 Domain: Knowledge of Teaching Skills + Components of Teaching Skills

3. There is no effect of efficiency of using the different skills on general teaching competence.

   There is no effect of efficiency of using the different skills on general teaching competence with respect to:

   3.1 Domain: Student Feedback

   3.2 Domain: Peer Feedback

   3.3 Domain: Supervisor Feedback

   3.4 Domain: Audio-self Feedback

   3.5 Domain: Audio+Supervisor Feedback

   3.6 Domain: Video-self Feedback

   3.7 Domain: Video+Supervisor Feedback
4. There is no effect of different modes of feedback on general teaching competence of student teachers.

The effect of different types of feedback on the general teaching competence of student teachers was tested in a comprehensive manner in the following ways:

4(A) There is no significant difference in the development of the different teaching skills through different types of feedback.

This sub-hypothesis was tested with respect to:

4.1(A) Domain: Skill of Introducing the Lesson
4.2(A) Domain: Skill of Explanation
4.3(A) Domain: Skill of Probing Questioning
4.4(A) Domain: Skill of Stimulus Variation
4.5(A) Domain: Skill of Blackboard Writing

4(B) There is no significant difference in the General Teaching Competence developed through different types of feedback.

4(C) There is no effect of different modes of feedback on the Level of Performance of Student Teachers.

This sub-hypothesis was tested with respect to:

4.1(C) Domain: Student Feedback
4.2(C) Domain: Peer Feedback
4.3(C) Domain: Supervisor Feedback
4.4(C) Domain: Audio-self Feedback
4.5(C) Domain: Audio+Supervisor Feedback
4.6(C) Domain: Video-self Feedback
4.7(C) Domain: Video+Supervisor Feedback
4(D) There is no effect of different modes of feedback on the General Teaching Competence of Student Teachers.

This sub-hypothesis was tested with respect to:

4.1(D) Domain: Student Feedback
4.2(D) Domain: Peer Feedback
4.3(D) Domain: Supervisor Feedback
4.4(D) Domain: Audio-self Feedback
4.5(D) Domain: Audio+Supervisor Feedback
4.6(D) Domain: Video-self Feedback
4.7(D) Domain: Video+Supervisor Feedback

4(E) There is no significant effect of knowledge of teaching skills, knowledge of components of teaching skills & development of teaching skills (through different modes of feedback) on General Teaching Competence of student teachers.

4(F) There is no significant effect of knowledge of components of teaching skills & development of teaching skills (through different modes of feedback) on General Teaching Competence of student teachers.

4(G) There is no significant effect of development of teaching skills (through different modes of feedback) on General Teaching Competence of student teachers.

5. There is no relationship between cognitive-based competence and performance-based competence of student teachers.

There is no relationship between cognitive-based competence and performance-based competence of student teachers with respect to:

5.1 Domain: Knowledge of Teaching Skills
5.2 Domain: Knowledge of Teaching Skills + Components of Teaching Skills
5.3 Domain: Knowledge of Teaching Skills + Components of Teaching Skills + Development of Teaching Skills

5.4 Domain: Student Feedback

5.5 Domain: Peer Feedback

5.6 Domain: Supervisor Feedback

5.7 Domain: Audio-self Feedback

5.8 Domain: Audio+Supervisor Feedback

5.9 Domain: Video-self Feedback

5.10 Domain: Video+Supervisor Feedback

6.6 PLAN OF THE STUDY

The investigator has selected the feedback as a manipulating variable to study the effect of different types of feedback on the teaching competence with the help of microteaching as a device of feedback. Microteaching helps a teacher to be a competent teacher by practicing small content for lesser time in front of a small group of students thus making them confident to face the whole class for full content and for normal classroom time.

The five skills i.e. Skill of Introducing the lesson, Skill of Explanation, Skill of Probing Questioning, Skill of Stimulus variation & Skill of Black Board writing are selected by the research worker for the study. For each skill the desirable components are selected on the basis of which skill is developed among student teachers.

The microteaching cycle adopted for the present study consists of following microteaching sessions:
6.7 DESIGN OF THE STUDY

For this study the investigator had selected Parallel Group Design with Matched Subjects, Pre-test-Post-test-only to solve the present research problem. The study was done by using parallel group design by involving three groups i.e. Control Group, Experimental Group-A and Experimental Group-B.

The Control Group had been provided with only knowledge of teaching skills, the Experimental Group-A had been provided with knowledge of teaching skills & knowledge of components of teaching skills and Experimental Group-B had been provided with knowledge of teaching skills, knowledge of components of teaching skills & the five teaching skills were also developed in them using different types of feedback.

To study the effect of different types of feedback the Experimental Group-B is further sub-divided into seven equal groups:

1. Sub-Group EB-I received Student Feedback.
2. Sub-Group EB-II received Peer Feedback.
3. Sub-Group EB-III received Supervisor Feedback.
4. Sub-Group EB-IV received Audio Self Feedback.
5. Sub-Group EB-V received Audio + Supervisor Feedback.

6. Sub-Group EB-VI received Video Self Feedback.

7. Sub-Group EB-VII received Video + Supervisor Feedback.

**Different Types of Variables used in the Study:**

**Independent Variables:** The independent variables were knowledge of teaching skills, knowledge of components of teaching skills & development of teaching skills, different modes of feedback i.e. Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback, Video-self Feedback & Video+Supervisor Feedback.

**Extraneous Variables:** These are the independent variables that are not related to the purpose of the study but may affect the dependent variables. Four extraneous variables i.e. Marks Obtained in B.Ed. Entrance Test, Marks Obtained in Teaching Learning Process Paper, Percentage of Marks Obtained in Graduation and Index of Academic Motivation were selected for the present study.

**Dependent Variable:** The dependent variables for the present study were percentage improvement in the teaching skills and teaching competence of student teachers.

### 6.8 SAMPLE FOR THE STUDY

The sample was selected from 299 student teachers enrolled for B.Ed. in 2005-06 out of which 229 were female & 70 were male. From these 210 student teachers were selected & randomly placed into three groups i.e. Control Group, Experimental Group-A & Experimental Group-B after matching them in terms of four extraneous variables i.e. Marks...

Experimental group “B” was further divided into seven sub groups i.e. EB-I, EB-II, EB-III, EB-IV, EB-V, EB-VI & EB-VII by adopting the same procedure as described above. As mentioned earlier the sub group EB-I, EB-II, EB-III, EB-IV, EB-V, EB-VI & EB-VII was trained with Student Feedback, Peer Feedback, Supervisor Feedback, Audio-Self Feedback, Audio+Supervisor Feedback, Video-Self Feedback & Video+supervisor Feedback respectively. There were ten student teachers in each sub group and each sub group was having 6 female student teachers & 4 male student teachers.

6.9 TOOLS USED FOR THE STUDY

The investigator selected the following tools to collect the desired data:

1. Junior Index of Motivation (Jim Scale) by Jack F. Frymer
2. Baroda General Teaching Competence Scale, prepared at the Centre of Advanced Study in Education, (CASE) M.S. University, Baroda
3. Observation Schedule cum Rating Scale for the Skill of Introducing the Lesson
4. Observation Schedule cum Rating Scale for the Skill of Black Board Writing
5. Observation Schedule cum Rating Scale for the Skill of Probing Questioning
6. Observation Schedule cum Rating Scale for the Skill of Stimulus Variation
7. Observation Schedule cum Rating Scale for the Skill of Explanation
8. Instruments for Audio Recording
9. Instruments for Video Recording
10. Questionnaire (self-made) for Student Teachers to evaluate their cognitive aspect
6.10 STATISTICAL TREATMENT

In this study the under mentioned statistical treatments were applied to give numerical descriptions and meaningful shape to the obtained data:

1. Mean
2. Standard Deviation
3. Product Moment Coefficient of Correlation
4. Multiple Correlation Coefficient
5. t Test
6. Analysis of Variance (ANOVA)
7. Sum of the Ranks Test
8. Stanine Scale

6.11 DELIMITATION OF THE STUDY

Due to constraints of time & resources available, this study is delimited in the following manner:

- The present investigation is confined to B. Ed. student teachers of D.A.V College of Education, Hoshiarpur. The study was conducted by selecting the student teachers doing B.Ed. during the session 2003-04, 2004-05 & 2005-06.

- The study is restricted to the acquisition of the five teaching skills i.e. Skill of Introducing the Lesson, Skill of Black Board Writing, Skill of Explanation, Skill of Probing Questioning & Skill of Stimulus Variation by the student teachers using different types of feedback.

- The research study is completed by conducting two pilot studies i.e. Pilot Study-I & Pilot Study-II and a Main Study (Present Study).
• In the Pilot Study-I, the effect of Student Feedback, Peer Feedback, Supervisor Feedback, Audio-Self Feedback and Audio+Supervisor Feedback in developing the teaching competence of the five selected teaching skills among B.Ed. student teachers of the session 2003-04, was studied by selecting Microteaching as the feedback device.

• In the Pilot Study-II, the effect of Student Feedback, Peer Feedback, Supervisor Feedback, Video-Self Feedback & Video+Supervisor Feedback in developing the teaching competence of the five selected teaching skills among B.Ed. student teachers of the session 2004-05, was studied by selecting Microteaching as the feedback device.

• In the Main Study (Present Study), the effect of Student Feedback, Peer Feedback, Supervisor Feedback, Audio-Self Feedback, Audio + Supervisor Feedback, Video-Self Feedback & Video+Supervisor Feedback in developing the general teaching competence using five selected teaching skills among B.Ed. student teachers of the session 2005-06, was studied by selecting Microteaching as the feedback device.

6.12 MAJOR FINDINGS

Findings of the present study are divided into four parts viz. :

6.12.1 Findings Pertaining to Knowledge of Teaching Skills

6.12.2 Findings Pertaining to Knowledge of Teaching Skills & Knowledge of Components of Teaching Skills

6.12.3 Findings Pertaining to Knowledge of Teaching Skills, Knowledge of Components of Teaching Skills & Development of Teaching Skills

6.12.4 Findings Pertaining to Development of Teaching Competence through different types of Feedback
6.12.1 FINDINGS PERTAINING TO KNOWLEDGE OF TEACHING SKILLS:

- The 't' ratio between the mean Pre Test & Post Test Scores of BGTC Scale of student teachers of Control Group is 5.04, which is highly significant at .01 level of significance.

- The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for Control Group has been found to be 0.03, which is not significant at .05 level of significance.

6.12.2 FINDINGS PERTAINING TO KNOWLEDGE OF TEACHING SKILLS & KNOWLEDGE OF COMPONENTS OF TEACHING SKILLS:

- The 't' ratio between the mean Post-Test Scores of BGTC Scale of student teachers of Control Group & Experimental Group-A is 3.29, which is significant at .01 level of significance.

- The 't' ratio between the mean Pre Test & Post Test Scores of BGTC Scale of student teachers of Experimental Group-A is 6.94, which is highly significant at .01 level of significance.

- The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for Experimental Group-A has been found to be 0.16, which is not significant at .05 level of significance.

6.12.3 FINDINGS PERTAINING TO KNOWLEDGE OF TEACHING SKILLS, KNOWLEDGE OF COMPONENTS OF TEACHING SKILLS & DEVELOPMENT OF TEACHING SKILLS:

- The 't' ratio between the mean Pre Test & Post Test Scores of BGTC Scale of student teachers of Experimental Group-B is 10.55, which is highly significant at .01 level of significance.
• The ‘t’ ratio between the mean Post-Test Scores of BGTC Scale of student teachers of Control Group & Experimental Group-B is 5.76, which is significant even at .01 level of significance. This reveals that the additional knowledge of components of teaching skills & development of teaching skills by using different types of feedback has significant effect on the General Teaching Competence of the student teachers.

• The ‘t’ ratio between the mean Post-Test Scores of BGTC Scale of student teachers of Experimental Group-A & Experimental Group-B is 2.70, which is significant even at .01 level of significance. This reveals that the development of teaching skills by using different types of feedback has significant effect on the General Teaching Competence of the student teachers.

• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for Experimental Group-B has been found to be 0.37, which is significant at .01 level of significance.

6.12.4 FINDINGS PERTAINING TO DEVELOPMENT OF TEACHING COMPETENCE THROUGH DIFFERENT TYPES OF FEEDBACK:

Findings under this category are sub divided into seven sub-categories:

6.12.4.1 Findings Pertaining to Student Feedback
6.12.4.2 Findings Pertaining to Peer Feedback
6.12.4.3 Findings Pertaining to Supervisor Feedback
6.12.4.4 Findings Pertaining to Audio-self Feedback
6.12.4.5 Findings Pertaining to Audio+Supervisor Feedback
6.12.4.6 Findings Pertaining to Video-self Feedback
6.12.4.7 Findings Pertaining to Video+Supervisor Feedback
6.12.4.1 Findings Pertaining to Student Feedback:

- The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-I has been found to be 0.260, which is not significant at .05 level of significance.

- Following inferences are drawn for developing the Skill of Introducing the Lesson:
  - No significant difference exists between Student Feedback & Peer Feedback; Student Feedback & Audio-self Feedback; Student Feedback & Video-self Feedback.
  - Student Feedback is inferior to Video+Supervisor Feedback & Audio+Supervisor Feedback at .01 level of significance and is inferior to Supervisor Feedback at .05 level of significance.

- For developing the Skill of Explanation, Student Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance and is inferior to Peer Feedback, Audio-self Feedback, Video-self Feedback at .05 level of significance.

- For developing the Skill of Probing Questioning following inferences are drawn:
  - No significant difference exists between Student Feedback & Peer Feedback; Student Feedback & Audio-self Feedback; Student Feedback & Video-self Feedback.
  - Student Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance.

- For developing the Skill of Stimulus Variation:
- No significant difference exists between Student Feedback & Peer Feedback; Student Feedback & Audio-self Feedback; Student Feedback & Video-self Feedback.
- Student Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance.

Following inferences are drawn for developing the Skill of Blackboard Writing:
- Student Feedback has been found to be superior to Audio-self Feedback at .01 level of significance & Video-self Feedback at .05 level of significance.
- Student Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance and is inferior to Peer Feedback at .05 level of significance.

- For developing the General Teaching Competence, Student Feedback has been found to be inferior to Video+Supervisor Feedback at .01 level of significance. No significant difference exists between other five pairs of feedback with Student Feedback.

- There was change in level of performance of student teachers trained through Student Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
  - 10% of the student teachers move from average to high performance category.
  - No change in percentage of student teachers showing below average performance.

- The 't' ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-I is 7.31, which is highly significant at .05 level of significance.
The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-I has been found to be 0.37, which is not significant at .05 level of significance.

6.12.4.2 Findings Pertaining to Peer Feedback:

- The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-II has been found to be 0.478, which is not significant at .05 level of significance.

- Following inferences are drawn for developing the Skill of Introducing the Lesson:
  - No significant difference exists between Peer Feedback & Student Feedback; Peer Feedback & Supervisor Feedback; Peer Feedback & Audio-self Feedback; Peer Feedback & Video-self Feedback.
  - Peer Feedback is inferior to Video+Supervisor Feedback & Audio+Supervisor Feedback at .01 level of significance.

- For developing the Skill of Explanation following inferences are drawn:
  - Peer Feedback is Superior to Student Feedback at .05 level of significance.
  - No significant difference exists between Peer Feedback & Audio-self Feedback; Peer Feedback & Video-self Feedback.
  - Peer Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance.

- Following inferences are drawn for developing the Skill of Probing Questioning:
  - No significant difference exists between Peer Feedback & Student Feedback; Peer Feedback & Audio-self Feedback; Peer Feedback & Video-self Feedback.
  - Peer Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance.
Following deductions are drawn for developing the Skill of Stimulus Variation:

- No significant difference exists between Peer Feedback & Student Feedback; Peer Feedback & Audio-self Feedback; Peer Feedback & Video-self Feedback.
- Peer Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback at .01 level of significance.

For developing the Skill of Blackboard Writing following inferences are drawn:

- Peer Feedback is superior to Student Feedback at .05 level of significance & Audio-self Feedback & Video-self Feedback at .01 level of significance.
- No significant difference exists between Peer Feedback & Supervisor Feedback; Peer Feedback & Audio+Supervisor.
- Peer Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

For developing the General Teaching Competence, Peer Feedback has been found to be inferior to Video+Supervisor Feedback at .01 level of significance. No significant difference exists between other five pairs of feedback with Peer Feedback.

- There was no change in level of performance of student teachers trained through Peer Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
- The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-II is 7.32, which is significant at .15 level of significance.
- The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-II has been found to be 0.39, which is not significant at .05 level of significance.
6.12.4.3 Findings Pertaining to Supervisor Feedback:

- The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-III has been found to be 0.703, which is significant at .05 level of significance.

- Following deductions are drawn for developing the Skill of Introducing the Lesson:
  - Supervisor Feedback is superior to Student Feedback at .05 level of significance and Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Supervisor Feedback & Peer Feedback and Supervisor Feedback & Audio+Supervisor Feedback.
  - Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

- Following inferences are drawn for developing the Skill of Explanation:
  - Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Supervisor Feedback & Audio+Supervisor Feedback.
  - Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

- Following deductions are drawn for developing the Skill of Probing Questioning:
  - Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Supervisor Feedback & Audio+Supervisor Feedback.
• Supervisor Feedback is inferior to Video+Supervisor Feedback at .05 level of significance.

• For developing the Skill of Stimulus Variation:
  • Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  • No significant difference exists between Supervisor Feedback & Audio+Supervisor Feedback.
  • Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

• For developing the Skill of Blackboard Writing following deductions are drawn:
  • Supervisor Feedback is superior to Student Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  • No significant difference exists between Supervisor Feedback & Audio+Supervisor Feedback & Supervisor Feedback & Peer Feedback.
  • Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

• No significant difference exists in the development of General Teaching Competence among student teachers by Supervisor Feedback in comparison to other six types of feedback i.e. Student Feedback, Peer Feedback, Video-self Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video+Supervisor Feedback.

• There was change in level of performance of student teachers trained through Supervisor Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
  • 20% of the student teachers move from average to high performance category.
  • No change in percentage of student teachers showing low performance.
• The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-III is 13.27, which is highly significant at .01 level of significance.

• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-III has been found to be 0.69, which is significant at .05 level of significance.

6.12.4.4 Findings Pertaining to Audio-self Feedback:

• The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-IV has been found to be 0.486, which is not significant at .05 level of significance.

• For developing the Skill of Introducing the Lesson inferences drawn are:
  - Audio-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

• Following deductions for developing the Skill of Explanation are drawn:
  - Audio-self Feedback is superior to Student Feedback at .05 level of significance.
  - No significant difference exists between Audio-self Feedback & Peer Feedback and Audio-self Feedback & Video-self Feedback.
  - Audio-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.
For developing the Skill of Probing Questioning inferences drawn are:

- Audio-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

For developing the Skill of Stimulus Variation:

- Audio-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

For developing the Skill of Blackboard Writing Audio-self Feedback has been found to be inferior to Student Feedback, Peer Feedback, Supervisor Feedback, Audio+Supervisor Feedback, Video-self Feedback & Video+Supervisor Feedback at .01 level of significance.

For developing the General Teaching Competence following inferences are drawn:

- Audio-self Feedback is inferior to Video+Supervisor Feedback at .01 level of significance and is inferior to Audio+Supervisor Feedback at .05 level of significance.
- No significant difference exists between other four pairs of feedback with Audio-self Feedback.
• There was change in level of performance of student teachers trained through Audio-self Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
  - No change in percentage of student teachers showing high performance.
  - 10% of the student teachers move from average to low performance category.

• The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-IV is 9.60, which is significant at .10 level of significance.

• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-IV has been found to be 0.16, which is not significant at .05 level of significance.

6.12.4.5 Findings Pertaining to Audio+Supervisor Feedback:

• The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-V has been found to be 0.798, which is significant at .01 level of significance.

• Following inferences are drawn for developing the Skill of Introducing the Lesson:
  - Audio+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Audio+Supervisor Feedback & Supervisor Feedback.
  - Audio+Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

• For developing the Skill of Explanation:
  - Audio+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
• No significant difference exists between Audio+Supervisor Feedback & Supervisor Feedback.

• Audio+Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

• Following inferences are drawn for developing the Skill of Probing Questioning:
  - Audio+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Audio+Supervisor Feedback & Supervisor Feedback.
  - Audio+Supervisor Feedback is inferior to Video+Supervisor Feedback at .05 level of significance.

• Following deductions are drawn for developing the Skill of Stimulus Variation:
  - Audio+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Audio+Supervisor Feedback & Supervisor Feedback.
  - Audio+Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.

• Inferences drawn for developing the Skill of Blackboard Writing are:
  - Audio+Supervisor Feedback is superior to Student Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance.
  - No significant difference exists between Audio+Supervisor Feedback & Peer Feedback and Audio+Supervisor Feedback & Supervisor Feedback.
  - Audio+Supervisor Feedback is inferior to Video+Supervisor Feedback at .01 level of significance.
• Following inferences for developing the General Teaching Competence are drawn:
  ▪ Audio+Supervisor Feedback is superior to Audio-self Feedback at .05 level of significance.
  ▪ No significant difference exists between other five pairs of feedback with Audio+Supervisor Feedback.
• There was change in level of performance of student teachers trained through Audio+Supervisor Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
  ▪ No change in percentage of student teachers showing high performance.
  ▪ 30% of the student teachers move from low to average performance category.
• The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-V is 10.90, which is significant at .01 level of significance.
• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-V has been found to be 0.66, which is significant at .05 level of significance.

6.12.4.6 Findings Pertaining to Video-self Feedback:
• The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-VI has been found to be 0.559, which is not significant at .05 level of significance.
• For developing the Skill of Introducing the Lesson inferences drawn are:
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- Video-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

- Following deductions for developing the Skill of Explanation are drawn:
  - Video-self Feedback is superior to Student Feedback at .05 level of significance.
  - Video-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

- For developing the Skill of Probing Questioning inferences drawn are:
  - Video-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.

- For developing the Skill of Stimulus Variation:
  - Video-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback and Supervisor Feedback at .01 level of significance.
• Deductions drawn for developing the Skill of Blackboard Writing are:
  • Video-self Feedback is superior to Audio-self Feedback at .01 level of significance.
  • Video-self Feedback is inferior to Video+Supervisor Feedback, Audio+Supervisor Feedback, Supervisor Feedback and Peer Feedback at .01 level of significance and is inferior to Student Feedback at .05 level of significance.

• No significant difference exists in the development of General Teaching Competence among student teachers by Video-self Feedback in comparison to other six types of feedback i.e. Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video+Supervisor Feedback.

• There was change in level of performance of student teachers trained through Video-self Feedback on Stanine Scale (rated in terms of Pre-Test & Post-Test BGTC Scores).
  • 10% of the student teachers move from average to high performance category.
  • No change in percentage of student teachers in the low performance category.

• The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-VI is 14.70, which is significant at .01 level of significance.

• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-VI has been found to be 0.44, which is not significant at .05 level of significance.

6.12.4.7 Findings Pertaining to Video+Supervisor Feedback:

• The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score for Experimental Group EB-VII has been found to be 0.850, which is highly significant at .01 level of significance.
• Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video-self Feedback at .01 level of significance for developing the Skill of Introducing the Lesson.

• Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video-self Feedback at .01 level of significance for developing the Skill of Explanation.

• Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Audio-self Feedback & Video-self Feedback at .01 level of significance and superior than Supervisor Feedback & Audio+Supervisor Feedback at .05 level of significance for developing the Skill of Probing Questioning.

• Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video-self Feedback at .01 level of significance for developing the Skill of Stimulus Variation.

• Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback & Video-self Feedback at .01 level of significance for developing the Skill of Blackboard Writing.

• Following deductions for developing the General Teaching Competence are drawn:
  • Video+Supervisor Feedback is superior to Student Feedback, Peer Feedback and Audio-self Feedback at .01 level of significance.
• No significant difference exists between Video+Supervisor Feedback & Supervisor Feedback, Video+Supervisor Feedback & Audio+Supervisor Feedback and Video+Supervisor Feedback & Video-self Feedback.

• There was change in level of performance of student teachers trained through Video+Supervisor Feedback on Stanine Scale.
  - 20% of the student teachers move from average to high performance category.
  - 10% of the student teachers move from low to average performance category.

• The ‘t’ ratio between the mean Pre Test & Post Test BGTC Scores of student teachers of Group EB-VII is 16.74, which is highly significant at .01 level of significance.

• The Coefficient of Correlation Between Cognitive-Based-Competence and Performance-Based-Competence for EB-VII has been found to be 0.72, which is significant at .05 level of significance.

6.13 CONCLUSIONS

On the basis of the above findings the following conclusions are drawn:

• The effect of knowledge of skills of teaching, knowledge of components of teaching skills & development of teaching skills has been calculated individually and as a whole. It was found that progressive improvement in the teaching competence of student teachers has been maintained through each additional input in the form knowledge of skills of teaching, knowledge of components of teaching skills & development of teaching skills provided to the student teachers. This shows that different stages of acquisition of teaching skills help in increasing the general teaching competence of student teachers. So we can say that the teaching practice programme of student teachers should be restructured and be made microteaching skills oriented.
Teaching Skill based theory lectures should be delivered by supervisors and subsequently teaching skills should be developed by selecting the appropriate medium for it.

- There was negligible positive relationship between Cognitive-Based-Competence and Performance-Based-Competence shown by student teachers trained by traditional technique by giving knowledge of teaching skills alone (Control Group) & student teachers trained by traditional technique by giving knowledge of teaching skills & knowledge of components of teaching skills (Experimental Group-A). This means that traditional technique fails to use Cognitive-Based-Competence possessed by student teachers effectively to develop Performance-Based-Competence. On the other hand there was significant positive relationship between Cognitive-Based-Competence and Performance-Based-Competence shown by student teachers trained by microteaching technique by giving knowledge of teaching skills & knowledge of components of teaching skills (Experimental Group-B). This means that microteaching technique helps to use Cognitive-Based-Competence possessed by student teachers effectively to develop Performance-Based-Competence.

- Another conclusion of the study is that both traditional as well as microteaching technique were found to be effective in improving the general teaching competence. The Experimental Group-B, which was exposed to microteaching technique showed higher improvement in general teaching competence as compared to Control Group & Experimental Group-A, which were exposed to traditional technique for development of performance-based-competence. Thus there is no need to abandon the present practice of training of student teachers rather it is to be supplemented with use of microteaching technique adequately.
• The Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score has been found to be highest for the student teacher trained through Video+Supervisor Feedback & least for Student Feedback. Out of seven types of feedback only three types i.e. Supervisor Feedback, Audio+Supervisor Feedback and Video+Supervisor Feedback showed a significant positive Coefficient of Correlation Between Efficiency of Using Five selected Teaching Skills & Post Test BGTC Scale Score. Thus we can conclude that out of seven different types of feedback selected three (i.e. Supervisor Feedback, Audio+Supervisor Feedback and Video+Supervisor Feedback) were found to be more effective for developing the five selected teaching skills than other.

• Out of seven different types of feedback i.e. Student Feedback, Peer Feedback, Supervisor Feedback, Audio-self Feedback, Audio+Supervisor Feedback, Video-self Feedback & Video+Supervisor Feedback selected for developing five selected teaching skills among student teachers using microteaching technique, Video+Supervisor Feedback found to be most effective. Audio+Supervisor Feedback & Supervisor Feedback follows it. Thus each teacher training college should have well equipped Micro Lab and adequate time should be provided in the teaching scheme of B. Ed. for training of student teachers in Micro Lab.

• Out of the seven types of feedback used in the present study all except Peer Feedback & Audio-Self Feedback were effective in improving the level of performance of student teachers in terms of general teaching competence. Video+Supervisor Feedback was found to be most effective in improving the level of performance of student teachers on Stanine Scale. Thus any type of feedback out of Student Feedback, Supervisor Feedback, Audio+Supervisor Feedback, Video-self Feedback & Video+Supervisor Feedback can be used for improving the level of performance of student teachers in terms of teaching competence. More time should be devoted in
developing the teaching skills by using Video+Supervisor Feedback to increase the level of performance of student teachers in terms of teaching competence.

- All the seven selected types of feedback results in improving the general teaching competence of student teachers. Thus any of seven types of feedback can be used for improving the teaching competence of student teachers. The mean difference in terms of Pre-Test & Post-Test BGTC Scores was found to be most significant for Video+Supervisor Feedback and least significant for Peer Feedback. So more emphasis may be given on Video+Supervisor Feedback for improving the general teaching competence of student teachers.

- There was insignificant positive relationship between Cognitive-Based-Competence and Performance-Based-Competence shown by student teachers trained by Student Feedback, Peer Feedback, Audio-self Feedback, & Video-self Feedback. This means that these four types of Feedback fail to use Cognitive-Based-Competence possessed by student teachers effectively to develop Performance-Based-Competence. On the other hand there was significant positive relationship between Cognitive-Based-Competence and Performance-Based-Competence shown by student teachers trained by Supervisor Feedback, Audio+Supervisor Feedback & Video+Supervisor Feedback. Thus to use Cognitive-Based-Competence possessed by the student teachers to develop Performance-Based-Competence they should be trained by either Supervisor Feedback or Audio+Supervisor Feedback or Video+Supervisor Feedback.

6.14 IMPLICATIONS

The present research study emphasizes the student-teaching aspect to produce competent teachers. The traditional teaching practice consists of two main elements: theoretical knowledge & practical teaching. Theoretical knowledge mainly includes demonstration
lessons on teaching, the format of lessons plans, aspects of planning, organisation and evaluation etc. related to classroom teaching. These inputs are verbal & tend to be global and sometimes vague. These aspects are no doubt important but basically they do not touch the two most important aspects i.e. knowledge of teaching skills and knowledge of components of teaching skills. Consequently the theoretical knowledge provided brings cognitive and attitudinal changes in teacher, which are of global nature and does not contribute effectively to produce competent teachers. According to present study knowledge of teaching skills and knowledge of components of teaching skills contribute significantly in improving the teaching competence of student teachers. Therefore knowledge of teaching skills and knowledge of components of teaching skills should be provided to the student teachers before the practical teaching in the planned & systematic manner by restructuring the student teaching programme.

With regard to practical teaching, it is generally assumed that during this period the student teacher will develop proficiency in basic teaching and classroom management. According to traditional habits, an experienced teacher educator is sitting at the back of the classroom making some unstructured notes of what is seen or heard during the lesson. Even if you could see and hear clearly, the selective human memory and the restricted ability to make clear perceptions can play tricks at the expense of the student or mentor. The consequence may be that their interpretations differ dramatically. The supervisor lacks the objective feedback on the performance essential both to motivating and directing behavioural modifications. It has been found in the present study that the student teachers trained in the teaching skills through different types of feedback (under microteaching setting) enhance their teaching competence significantly by receiving objective and meaningful feedback. Thus the present practical teaching programme should be restructured and teaching skills training component should be adequately and judicially incorporated.
Many times it happens a student-teacher inspite of having very good academic score in B. Ed. fails to teach effectively in the real classroom situations. This will jeopardise the image of the teachers & educational college from where he has been graduated. Generally the problem is neither with the teachers nor with educational college but with improper training method used to develop teaching competence. This is due to lack of proper transformation of his cognitive-based-competence into performance-based-competence. In the present research method it has been found that traditional training method is not effective in transforming the cognitive-based-competence into performance-based-competence. Even when we use skill based training method using different types feedback under microteaching setting, only three types of feedback i.e. Video+Supervisor Feedback, Audio+Supervisor Feedback & Supervisor Feedback found to be effective in transforming the cognitive-based-competence into performance-based-competence. Thus more emphasis should be given to the skill-based training using above three types of feedback. This will narrow down the gap between cognitive-based-competence and performance-based-competence possessed by the student teachers. So the managements of the educational colleges should take concrete steps to provide adequate infrastructure related to the audio & video feedback in their technology lab so that student teachers can be trained effectively. This is going to be the need of the hour for educational colleges to survive in this highly competitive scenario.

With mushrooming of B. Ed. Colleges in the State at a sky rocketing pace, the colleges are facing lot of problems to arrange the teaching practice for their student teachers in the reputed schools. The problem is not with the scarcity of reputed schools in the adjoining areas but with attitude of the school management to allow teaching practice in their schools. The school authorities normally complain that when they allow the student teachers to teach in their classes, most of them are failed to face the class with a confidence, arouse any interest in the students towards learning and control the class. Further this will create the
indiscipline in the school and hamper the normal teaching activities in a big way. As per findings of the present study if the student teachers are trained in the teaching skills in the technology lab of the college by providing different types of feedback under simulated conditions before going to actual classroom situations then almost all the complaints of school authorities can be resolved. After these efforts of colleges of education it will become easier for them to send their student teachers in the reputed schools and establish a long lasting rapport with the school authorities.

The modern education demands that the teacher has to be creative and innovative. The regular classroom situation neither encourages nor provides the student teacher an opportunity to test alternative methods and styles essential for developing effective teaching strategies. When the student teachers are trained in a teaching skill with a particular type of feedback using microteaching as a feedback device, after receiving the feedback he has to re-plan his micro lesson in the light of suggestions and re-teach. Then he receives the re-feedback and again re-plans & re-teach, the whole process continues till the competence is achieved in the teaching skill. This will bring alternative ideas for reforming teaching learning process and preparing teachers for quality performance in a changing educational environment. This will make the student teachers more creative and innovative. Thus this new approach provides one solution to nurture the creativity and innovativeness in student teachers.

Since it has been found in the present study that knowledge of teaching skills and knowledge of components of teaching skills have significant effect in improving the teaching competence of student teachers. Microteaching can be an effective tool for the development of teacher training materials. When training protocols are created to demonstrate new teaching skills, microteaching sessions can be developed and taped giving instances and non-instances of the skill. Asking trainees to view these tapes together is an effective way to highlight and demonstrate the essential aspects of the skill being taught. Therefore suitable
learning resources in the form of audiotapes & videotapes and handbooks of micro lessons related to core teaching skills can be prepared. This work can be undertaken by universities, teacher-training institutes of the state and other organisations involved in the development of educational materials. These institutes should develop these resources in the context of Indian classroom and teaching-learning situations. Subsequently these materials can be used by student teachers of different educational colleges to understand & learn these teaching skills and sharpen their teaching competence.

Implication of the present study can also be thought of from the in-service teachers point of view. When in-service teachers are taught of teaching skills and further trained in these skills, there is going to be a profound effect on the general method of teaching and improvement in the teaching learning process in the classroom. For this purpose summer training should be provided to the in-service teachers to acquire these skills. The State Governments should undertake certain policy decisions to train all the in-service teachers by running suitable schemes. Further in this direction State Level and National Level Seminars/ Workshops can be organised for in-service teachers. In this way in-service teachers are expected to give careful and thoughtful consideration to classroom situations and they will be able to increase the understanding of teaching and learning. This implication is useful not only to educational organizations but also to other professional organizations. This is going to help in a big way to improve the quality of education of our country.

6.15 FUTURE SCOPE

The future scope of the present study is :

- The present research study was undertaken with 210 student teachers of D.A.V. College of Education, Hoshiarpur. By enlarging the sample size and selecting the
student teachers from different colleges investigators may conduct the similar research studies.

- A similar research study may be conducted to verify and validate the results of the present investigation.

- The present research study was undertaken on the student teachers of Panjab University, Chandigarh only. Similar research studies may be conducted by selecting the student teachers from different Universities of Punjab.

- Further investigation may be undertaken with different standardised tools and rating scales having high reliability and validity.

- In the present research study, the effect of seven different types of feedback was ascertained by providing them immediate & quantitative feedback but the effect of delayed & qualitative feedback remains to be determined.

- Similar research study can be conducted to explore the effect of Student+Peer Feedback, Peer+Supervisor Feedback, Student+Supervisor Feedback with and without Audio & Video Recording.

- In the present investigation the effect of five selected teaching skills is ascertained further research can be conducted to determine the effect of rest of the micro skills on the teaching competence of student teachers.

- It has been found in the present study that the teaching competence of B.Ed. Student Teachers can be developed with the help of different types of feedback. A similar research study may be conducted to determine the effect of different types of feedback on the teaching competence of E.T.T. Student Teachers.