CHAPTER – IV

DEVELOPMENT AND IMPLEMENTATION OF THE TRAINING PROGRAMME

4.0 INTRODUCTION

This chapter presents details of the development and implementation of the training programme. The input for the development of the training programme was collected from various sources. Firstly, from the review of the related literature and analysis of the existing teacher training programme the researcher did not find any pre-service teacher training programme for Computer Education teachers for transacting the Computer Education curriculum. Though IGNOU is offering in-service teacher training programme for secondary teachers only with the specialization of Computer Education, many working computer teachers do not go for this programme due to two years duration and more cost. In teacher training courses at university level and college level Computer Education was found offered as a special field subject or/and compulsory subject but there was no such methodology subject found for teaching Computer Education as a subject at school level. Secondly, the researcher analyzed the Computer Education textbook of standard VIII which helped to find out different components needed for training programme to transact Computer Education curriculum Thirdly, the researcher analyzed the existing teaching-learning process of Computer Education by observing both theory and practical classes (for detailed analyses refer Chapter V). On the basis of these analysis and observation the researcher developed the training programme and implemented the same. The details about the development and implementation of the training programme are presented as follow.

4.1 ANALYSIS OF TEXTBOOK

Textbook have always been considered as standard means of instruction in given subject of study. It can be used for self-learning by the students either in classroom or at

home Dave (1968) said, *'a textbook is usually designed for producing variety of instructions inside and outside the classroom which ultimately results into learning'* Taneja (1973) observes that, *'a textbook is equally important for the teacher as it defines and delimits the content of teaching. It helps in planning as well as conducting the programme stressing the importance of textbook'* Textbook determines the required pedagogy needed to teach any subject. Though `method of teaching Computer Education` is not offered as a method subject in teachers training institutes, the required pedagogy needed to teach Computer Education is not clear and known. The text book can determine the nature of the subject and the required pedagogy needed for teaching the subject. Thus, to present the content effectively in the class and to decide the pedagogy required for teaching the subject, it is essential to analyze the content of the textbook which will help the teachers in deciding the pedagogical need of specific chapters. So, the investigator felt a need to analyze the Computer Education Textbook of standard VIII which helped him to find out the inputs for training programme for Computer Education teachers.

4.1.1 Content Analysis of the Computer Education Textbook

This section presents detailed chapter wise content analysis of standard VIII Computer Education Textbook to realize objective two of the study i.e. 'to design a framework for effective Computer Education teaching-learning at secondary level'. The central idea behind the content analysis was to find out the training input. The investigator analyzed the content keeping in mind certain nature of the content like, factual information, generalization, examples, drill and practice/exercise, syntax, directions/instructions, and illustration/pictures/screen and the pedagogy needed for these content.

The analyzed contents was used to examine the nature of Computer Education on the basis of which needed teaching approaches, methods, models of teaching, teaching aids, interaction, evaluation, planning, required mastery level etc. were developed for the training programme.

The Computer Education Textbook entitled *"Introduction to Computer"* has been prepared by Gujarat State Secondary and Higher Secondary Education Board. This book has been divided into seven chapters e.g. (i) Introduction to Computers, (ii) Windows' Concepts and Components, (iii) Files and Folders, (iv) Using Additional Windows Facilities, (v) Introduction to Word Processing using MS word, (vi) Introduction to Internet (Part-I), and (vii) Algorithm Development (Part-I). The analysis of the content in the form of teaching learning framework including type of chapter, teaching methods, approaches, models of teaching required, teaching aids required, interaction, evaluation, and required mastery level for teaching Computer Education for standard VIII is presented chapter wise in table formats as follow.

4.1.2 Framework for Chapter 1: Introduction to Computers

The chapter one i e. *'Introduction to Computers'* introduces some important terminologies associated with computers. The terminologies are, Data, Computer, Programme, Types of Computer; Components of a Computer like CPU, Primary memory i e. RAM and ROM, Secondary memory i.e. Floppy Disks, Hard Disks, and Compact Disks, Input-Output devices i.e. Keyboard, Mouse, Scanner, Monitor, Printers, Scanners, Modem, and Joy Stick; Advantages of Computer; Applications of Computers and History of Generation of Computers. The analysis of this chapter showed that major emphasis is on the theory teaching for the development of the concept of computer and to familiarize the students with different components of computer. The teaching learning framework for the chapter *'Introduction to Computers'* is presented in table 4.1.

Table 4.1 Teaching Learning Framework for Chapter 1 i.e. 'Introduction to Computers'

Type of Chapter	Information type (Theoretical)
Methods of Teaching needed	Lecture cum Discussion
Approach/s Needed	Inductive
Model of Teaching Needed	Advance Organizer Model
Teaching Aids Required	Floppy (3 5", 5.25"), CD, Keyboard, Mouse, Picture of Hard Disk or Original Hard Disk and picture of Computers (Different Generations).
Type of Interaction	Teacher and Students interaction
Evaluation Required	Project Work (Collection of Picture and related information of different components of Computer)
Expected Mastery Level Required	60% to 70%

4.1.3 Framework for Chapter 2: Windows' Concepts and Components

The chapter two *'Windows' Concepts and Components'* deals with concepts and components of Windows XP Operating system. The concepts given in this chapter were Operating System (Command Line Interface and Graphic User Interface); Starting with Windows XP (Booting, Desktop Icon and Taskbar, Mouse-clicking and double clicking and dragging). The components given in this chapter were Title bar, Menu bar, Windows' Operations (Moving, Resizing, Minimizing, Maximizing, Cascade windows, Title Windows Horizontally, Title Windows Vertically, Arranging Icons on Desktop, Using Start Menu, Using Control Panel, Using Help and Support, Logging Off and Quitting Windows XP). This chapter also dealt with the type of Operating Systems like, (i) Single-user, Single-tasking Systems, (ii) Single-user, Multi-tasking Systems, (iii) Multi-user systems, (iv) Multiprocessing systems and (v) Real-time Operating System. The analysis of this chapter showed that major emphasis is on theory cum practical to acquaint the students with Windows XP Operating system. The teaching learning framework for this chapter *'Windows' concepts and Components'* is presented in table 4.2.

Table 4.2: Teaching Learning Framework for Chapter 2 i.e. 'Windows' Concepts and Components

Type of Chapter	Theory cum Practical
Methods of Teaching Needed	Lecture cum Demonstration
Approach/s Needed	Inductive
Model of Teaching Needed	Mastery Learning Model
Teaching Aids Required	Computer & LCD Projector, OHP
Type of Interaction	Teacher and Students interaction
Evaluation Required	Practical Work and Continuous and Comprehensive Evaluation
Expected Mastery Level Required	80% to 100%

4.1.4 Framework for Chapter 3: Files and Folders

The chapter three i.e. *'Files and Folders'* introduces the concept of files and folders and two powerful features of Windows XP to create and manage Files and Folders called My Computer and Windows Explorer. This chapter also dealt with the practical aspects e.g. Creating Files and Folders, Managing Files and Folders, File Operations (Cut, Copy, Paste, Removing Files and Folders and Recycle bin), and Using Windows Explorer. The analysis of this chapter showed that major emphasis is on practical which needs hands on experience. The teaching learning framework for the chapter 3, *'Files and Folders'* is presented in table 4.3.

Table 4.3: Teaching Learning Framework for Chapter 3 i.e. Files and Folders

Type of Chapter	Theory cum Practical (Major emphasis on Practical)
Methods of Teaching Needed	Demonstration and Discussion
Approach/s Needed	Inductive approach for theory and Participatory Approach for practical
Model of Teaching Needed	Mastery Learning Model
Teaching Aids Required	Computer and LCD Projector, OHP
Type Interaction	Teacher and Students and student-student
Evaluation Required	Practical Work and Continuous and Comprehensive Evaluation
Expected Mastery Level Required	80% to 100%

4.1.5 Framework for Chapter 4: Using Additional Windows Facilities

The chapter four i.e. *'Using Additional Windows Facilities'* discuss various tasks that can be performed in Windows operating system using Accessories. This chapter deals with various programs like, Calculator; Notepad and its basic operations ('Cut', 'Copy', 'Paste', 'Select All', 'Search', and 'Creating and Saving file'); WordPad (creation of new file & saving it, use of menu bar, tool bar, format bar, ruler bar, inserting image or picture); Paint (use of menu bar, tool box, and colour box); Media Player and Address Book. These programs are to manage common tasks like, performing calculations, preparing letters, documents, memos, drawing pictures, managing contact addresses, listen to audio songs, and watch movies etc. which in turn can enhance creativity of students especially through the program like, Paint. The analysis of this chapter showed that major emphasis of this chapter was on practical to enhance creativity of the students. The teaching learning framework for the chapter *'Using Additional Windows Facilities'* is presented in table 4.4

Table 4.4 Teaching Learning Framework for Chapter 4: Using Additional Windows Facilities

Type of Chapter	Theory cum Practical (major emphasis on practical)
Methods of Teaching Needed	Lecture cum Demonstration
Approach/s Needed	Inductive for theory and Participatory Approach for practical
Models of Teaching Needed	Mastery Learning Model
Teaching Aids Required	Computer, LCD Projector
Type of Interaction	Teacher-student and student-student interaction
Evaluation Required	Practical work on Windows facilities and Continuous and Comprehensive Evaluation
Expected Mastery Level Required	80% to 100%

4.1.6 Framework for Chapter 5: Introduction to Word Processing Using Ms Word

The chapter five i.e. *'Introduction to Word Processing Using MS Word'* introduces how computers can be used to work with documents. This chapter discusses the features of work processor called MS Word for preparing various kinds of documents. It explains about Meaning of Word Processor: its features, need and general applications; Components of Opening Screen (title bar, menu bar and its menu items like File, Edit, View, Insert, Format, Tools, Table, Windows and Help), Pull Down Menus, Toolbars (standard toolbar and formatting toolbar), Tool Buttons, Vertical Scrollbar and Status bar; Creating, Editing and Saving a document; Cursor Movement using Key Board and Mouse, Formatting Texts and Paragraphs using Toolbar; Working with Tables (creating table, inserting/deleting/rows/columns); Drawing various Objects and Pictures (drawing various shapes, drawing text box and inserting pictures); Printing a Document, Spell Check and Grammar; and Mail Merge and its use. The analysis of chapter five showed that the major emphasis was on practical aspect to make the student to use the features of MS Word effectively. The teaching learning framework for the Chapter 5 i.e. *'Introduction to Word Processing Using MS Word'* is presented in table 4.5.

Table 4.5 Teaching Learning Framework for Chapter 5: Introduction to Word Processing Using MS Word

Type of Chapter	Practical (major emphasis on practical)
Methods of Teaching Needed	Lecture cum Demonstration
Approach/s Needed	Inductive
Models of Teaching Required	Mastery Learning Model
Teaching Aids Required	Computer with LCD Projector
Type of Interaction	Teacher-student interaction
Evaluation Required	Practical work and Continuous and Comprehensive Evaluation
Expected Mastery Level Required	80% to 100%

4.1.7 Framework for Chapter 6: Introduction to Internet (Part - I)

The chapter six *'Introduction to Internet (Part-I)'* introduced meaning of internet and how internet can be used for various purposes. This chapter explained about Meaning of Internet; Uses of Internet and its various services (File Transfer protocol, Search Engine, World Wide Web, E-mail, Usenet/internet new, Chatting and Video Conferencing); World Wide Web and its components (Hyper Text Transfer Protocol, Hyper Text Markup Language and Universal Resource Locator); Working of World Wide Web; Internet Addresses and getting an Internet Connection; History of Internet; Internet Terminologies; Current Scenario and Hands on Experience (Case study 1 and 2). The analysis of chapter six showed that major emphasis was on theoretical aspect to make the student familiar with the concept of internet and its uses. The teaching learning framework for the chapter 6 *'Introduction to Internet (Part-I)'* is presented in table 4.6.

Table 4.6 Teaching Learning Framework for Chapter 6: 'Introduction to Internet (Part-I)'

Type of Chapter	Theory cum Practical (major emphasis on theory)
Methods of Teaching Needed	Lecture cum Discussion
Approach/s Needed	Participatory Approach
Models of Teaching Required	Advance Organizer Model
Teaching Aids Required	Chart of Computer Network and Working of WWW and picture of Modem and Server
Type of Interaction	Teacher-student and student-student interaction
Evaluation Required	Collection of information about Internet, WWW and Internet addresses.
Expected Mastery Level Required	60% to 80%

4.1.8 Framework for Chapter 7: Algorithm Development (Part - I)

The chapter seven *'Algorithm Development (Part-I)'* introduced algorithm development. This chapter explained about the Meaning of Flowchart and Variable; Components of Flowchart (Terminal symbol, Input/output symbol, processing symbol, Decision symbol, connector symbol and Flow Line); Example of Flowchart; Rules to draw Flowchart and advantages and disadvantages of flow chart. The analysis of this chapter 7 showed that the major emphasis was on theoretical aspect to develop the logical thinking ability of the students through flowchart. Thus, it was needed more exercise/practice on preparing flowchart. The teaching learning framework for the chapter *'Algorithm Development (Part-I)'* is presented in table 4.7.

Table 4.7 Teaching Learning Framework for Chapter 7: Algorithm Development

Type of Chapter	Theory (major emphasis on theory)
Methods of Teaching Needed	Problem Solving and Discussion
Approach/s Needed	Inductive
Models of Teaching Needed	Mastery Learning Model
Teaching Aids Required	Flowchart and its Symbol
Type of Interaction	Teacher-student and student-student interaction
Evaluation Required	Preparation of Flow Chart and Continuous and Comprehensive Evaluation
Expected Mastery Level Required	80% to 100%

4.2 PRE-TRAINING OBSERVATION OF THEORY AND PRACTICAL CLASSES

The input for the training programme was also obtained from theory and practical classroom observation analysis of the existing teaching-learning process of Computer Education at secondary school level. In theory and practical classes various activities of both teachers and student were observed. The purpose of the observation was to know the existing teaching-learning process in terms of teaching methods, skills, techniques, and resources used, the interaction between teachers and students and the process of evaluation used by Computer Education teachers. The detailed analysis and interpretation of pre-training theory and practical classroom observation have been presented in chapter V. The summary of theory and practical observation analysis is presented as follows.

4.2.1 Summary of Theory Observation Analysis

The summary and conclusion of the analysis of theory classroom observation are presented as follow.

1) The teachers didn't use lesson plan during teaching and in 50.12 percent of the classes, the lessons were introduced arbitrarily.

2) Informal discussion with teachers revealed that teachers' had no knowledge about approaches of teaching.
3) With respect to students' participation and response during teaching-learning process, it was found very less as teachers didn't provide scope for participation and giving response to students.
4) The observation leads to the conclusion that the teachers' were lacking in the use of skills like, blackboard work, explanation, illustration with example, reinforcement, questioning and achieving closure The quality of blackboard work was found to be poor. Teachers were found not giving importance to application and understanding levels of questions during teaching (For details of its percentage refer Chapter – V).
5) In majority of classes, teachers didn't give importance to homework and assignment in theory classes. It was also observed that teachers were lacking in classroom management skill.
6) It was observed that in majority of the classes, teachers didn't summarize the lesson at the end of the period.
7) In terms of methods of teaching, it was found that teachers used lecture and demonstration method but the use of these methods were found less interesting and less number of students were found involved in the process.

4.2.2 Summary of Practical Observation Analysis

The summary and conclusions of the analysis of practical classroom observation are presented below as follow.

1) Teachers didn't give importance to sitting arrangement and occupying of computers by students for practice. In almost all the classes no clear instructions regarding practical work was given. Teacher gave only oral instruction regarding practice work.
2) In demonstration classes, teachers' activities were found routine i.e. only demonstrating, not paying attention to students' inattention and not enquiring abut students understanding.

3) It was observed that lack of teacher's attention and improper supervision leads to inconsistency in students' practical work. It was also found that cooperation and discussion among students' helped them to solve their practical task.
4) It was observed that bigger size class with single teacher and engagement of teachers other than practical activities became the obstacle in providing individual attention and guidance to students.
5) In terms of practical classroom management by teachers, it was observed that teachers were lacking in classroom management and used punishment and were found shouting to maintain discipline. And also observed that teachers didn't give assignment to students for next class.

4.3 DESIGN OF THE TRAINING PROGRAMME

This section presents the design of the training programme to realize objective two of the present study i.e. 'to design a framework for effective Computer Education teaching-learning at Secondary School level'. The term design refers to the frame work needed for effective transaction of Computer Education teaching-learning process. The designing of the framework was done on the basis of the content analysis of the Computer Education textbook, conclusions derived from the observation of theory and practical classes and theoretical understanding of the pre-service teacher training programme. All these helped to find out the training components and for preparing teaching-learning framework for each chapter of standard VIII Computer Education textbook. (For Chapter wise framework refer table 4 1 to 4.7). The training components included in the training programme were: importance of training, writing instructional objectives in behavioural terms, principles and maxims of teaching, skills of teaching, instructional media, methods and approaches of teaching, classroom environment, classroom management, cooperative learning, advance organizer and mastery learning models of teaching, lesson planning and evaluation. While designing the training programme consideration was made not to make it too lengthy Taking into all these components, a nine days training programme having 18 sessions was prepared (For detailed training schedule refer Appendix-XI).

4.4 DEVELOPMENT OF THE TRAINING PROGRAMME

This section presents details regarding the development of the training programme for Computer Education teachers. The input and components of the training programme which was collected from different sources were organized in logical order and details regarding each component were written. After writing about each component, activities for the same component were prepared. The prepared draft of the training material was given to three experts for its content validation. The necessary suggestions and comments were incorporated and final draft was prepared by the researcher. Session wise schedule was prepared for the implementation of the training programme.

4.5 IMPLEMENTATION OF THE TRAINING PROGRAMME

According to the need of the training programme, researcher took the help of three experts (one professor, one reader and one senior lecturer) from the Department of Education, Centre of Advanced Study in Education, The Maharaja Sayajirao University of Baroda, Vadodara for providing training to the Computer Education teachers of the experimental group. Along with the experts the researcher also provided training to the teachers. The researcher explained the purpose of the study to the experts and gave them the study material of the training programme in advance. Details about the sessions of the training programme are given as follow.

4.5.1 Introduction about the Training Programme

This section presents details regarding the implementation of the training Programme that was developed by the investigator and also with the help of experts to achieve the objectives delineated. The training programme was carried out for the Computer Education teachers of the sample school. The training programme consisted of eighteen sessions Each session was of two hours duration and every day two sessions were conducted over a period of nine days. The session format consisted of the following

aspects like, objectives and procedure of the conduction of the session and the observations of the investigator.

The training programme started with an ice-breaking session and introduction about training and its importance. This session followed by the following sessions like, aims and objectives and writing instructional objectives, principles and maxims of teaching, skills of teaching, medias of teaching, classroom environment, classroom management, methods of teaching and approaches of teaching, cooperative learning, advance organizer model of teaching, mastery learning model, and evaluation and lesson planning. The details of the sessions are presented here session wise.

4.5.2 Session I: Ice-Breaking and Introduction about Training and its Importance

The first session, an ice-breaking session of the training programme involved activities in removing the inhibitions that normally exists in any group of individuals in general and a group of teachers of the same school in particular. The activities were carried out to create cohesiveness, openness and free feelings among the participant teachers, to make them understand and to know the importance of training programme for computer teachers for teaching Computer Education as a subject.

4.5.2.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To provide participating teachers an opportunity to understand each other.
2. To provide participating teachers an opportunity to share their experiences in the group.
3. To provide the participating teachers an overall view of the training programme.
4. To enable the participating teachers understand the importance of training programme for teaching Computer Education

4.5.2.2 Procedure

The ice-breaking session was consists of two stages. At the first stage, two different activities were conducted. They were (i) self-introduction and (2) sharing of experience by the teachers. In the second stage an overview of the training programme was presented. After this the importance and need of training programme was discussed.

Activity I

The investigator initiated the activity by stating the name, occupation/teaching subject preferences, likes and dislikes of the investigator. Similarly, all the participant teachers were requested to state the same openly among the members of the group.

Activity II

All the participants were asked one after another to share their experiences as a Computer Education teacher and also the problems they used to face during classroom teaching both in theory and practical. All the participants started sharing their experiences freely one after another even in the presence of their principal. The problems they stated were as follow.

- Difficulties to manage the class.
- Problems to carryout practical because of lack of hardware support i.e. shortage of computer, LCD Projector and also the lack of teachers.
- Overburden with class activities.
- No provision for pedagogical training.
- Over crowded class.
- Less periods/time to complete the course.

At the second stage, an overview of the training Programme i.e. content and time duration was presented before the participant teachers. After presentation of the overview the importance and need of training in general and Computer Education teachers in particular was presented.

4.5.2.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers were involved in all the activities conducted by the investigator in the first session.
2) Participant teachers shared their experiences freely as computer teachers.
3) Participant teachers showed their interest in training programme

4.5.3 Session II: Aims, Objectives and Writing Instructional Objectives

Aims and objectives are the two important aspect of any educational activity. Aims of education are based on philosophical and socio-psychological aspects of our society and culture. Aims are broad and stated in general terms. They represent long-term outcomes and provide overall direction. Objectives are milestones to attain the aims. Objectives are specific, direct and practical in nature. Objectives are related to the learning outcomes or change in the behaviour of students, which are achieved at the end of instruction.

Instructional objectives refer to the objectives, which could be achieved at the end of each unit of instruction. Instructional objectives are classroom objectives, unique to each unity or a teaching point. They are formulated in such a way that they are concrete and tangible. The objectives involve information, skills, attitudes and interest that could be developed through a particular topic or subject in the classroom.

The writing of instructional objectives in behavioural terms has many components. Passi and Lalita (1976) have mentioned four components of writing instructional objectives. They are: (i) it should be well stated, (ii) it should be adequate with respect to learning outcomes, (iii) it should be relevant to the content, and (iv) it should be adequate with respect to the content out line.

4.5.3.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand aims and objectives of teaching.
2. To enable the participating teachers understand the concept of instructional objectives.
3. To enable the participating teachers understand the components of writing instructional objectives in behavioural terms.
4. To enable the participating teachers to write instructional objectives in behavioural terms

4.5.3.2 Procedure

The presentation of this session had two stages. At the first stage, an introduction about what is aims and objectives of teaching was presented by giving examples and discussed. Before presenting the meaning of instructional objectives and how to write it in behavioural terms participant teachers were asked to state some objectives whit respect to a unit of Computer Education. They stated those like, *'to teach in a systematic manners', 'the students will like the teaching of teacher', 'to teach with examples', and 'the students will feel happy'*. After collecting their responses, the meaning of instructional objectives and how to write instructional objectives in behavioural terms was presented. At the second stage, an activity was given to the participant teachers so that they would be in a position to write instructional objectives in behavioural term.

Activity

"Write aims and instructional objectives by taking any one chapter of your interest from the Computer Education textbook of standard VIII".

For this activity the participant teachers were divided into two groups. Each group was consisted of three teachers. After completion of their activity, one teacher from each group was asked to present their activity. The objectives written by them are given below.

- Students will be able to define the term Internet.
- Students will be able to state the use of Internet.
- Students will be able to differentiate different components of Internet.
- Students will be able to state the uses of computer in personal life.
- Students will be able to define windows concepts.
- Students will be able to name the operating system.
- Students will be able to give an example related to Internet.

4.5.3.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers were interested to carryout the activities.
2) Participant teachers interacted and discussed among their group members to write instructional objectives.
3) Participant teachers clear their doubts by asking questions related to writing instructional objectives.
4) One participant teacher from each group presented their activity clearly.

4.5.4 Session III: Principles and Maxims of Teaching

Teaching is a skilled job and a complex task. By all means, it is done for the benefit of the pupils i.e. to bring desirable changes or improvement in their behaviour. Success of teaching depends upon a good planning and masterly execution of the planning. Educationists and psychologists have established some general principles and maxims of teaching which is quite helpful in making the task of teaching effective.

Principles and maxims of teaching are very helpful in obtaining the active involvement and participation of the learners in the teaching-learning process. They quicken the interest of the learners and motivate them to learn. They make learning effective, inspirational, interesting and meaningful. They keep the students attentive towards the teaching-learning process. Therefore, a good teacher should be quite familiar to the principles and maxims of teaching.

4.5.4.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand different principles of teaching
2. To enable the participating teachers understand different maxims of teaching.

4.5.4.2 Procedure

The presentation of this stage had also two stages. At the first stage, the focus was to make the participant teachers to understand the importance of principles and maxims of teaching, different principles and maxims of teaching and their application in the teaching of commuter education. At the second stage, an activity was given to the participant teachers to help them to identify the principles and maxims that can be applied in teaching a topic.

Activity

"Take a chapter from your computer textbook. List down and rationalize in brief the major principles and maxims those can be applied while teaching to the students".

For this activity the participant teachers were divided in two groups. Each group was consisted of three teachers. After completion of their activity one teacher form each group was asked to present it.

4.5.4.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers took part during discussion and participated in question answer.
2) Participant teachers clarified their doubts regarding the difference between principles and maxims of teaching.
3) Participant teachers expressed that the principles and maxims of teaching will be helpful in teaching Computer Education.
4) Participant teachers gave the example from the computer subject as how to use principles and maxims of teaching.
5) On the basis of activity given to them, participant teachers were able to list down and rationalize the major principles and maxims those can be applied in teaching Computer Education.

4.5.5 Session IV and V: Skills of Teaching

The fourth and fifth sessions of the training programme were to help the participating teachers to understand the concept and importance of teaching skills in teaching. Teaching demands certain specific skills and competencies on the part of teachers like any other profession. Skills are very much essential to implement the principles and maxims of teaching. Skills provide means for the teachers to put theoretical knowledge into practice, which makes their teaching effective.

Teaching is a complex process, which consists of various activities to be performed by the teacher. These activities may be introducing a lesson, demonstration, providing feedback, explaining concepts and principles, questioning, drawing figures, writing on the blackboard, using teaching aids and other means of communication. These activities and behaviour of the teacher facilitates learning among students and leads to effective instruction. In the training programme six important skills i.e. introducing

lesson, questioning, probing, explanation, reinforcement and stimulus variation were discussed in detail in two sessions.

4.5.5.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the importance of skills of teaching.
2. To enable the participating teachers understand the skills of introducing lesson, questioning and probing.
3. To enable the participating teachers understand the skills of explaining, reinforcement and stimulus variation.

4.5.5.2 Procedure

The presentation of session four was limited to three skills e.g. Introducing lesson, Questioning and Probing This session had three stages. At the first stage, the focus was to know the previous knowledge of the participant teachers related to these skills. For this few questions were asked to them. Based on their response the second stage was started. At this stage the focus was on the understanding of these three skills. After presentation of each skill, discussion and question-answer was carried out to have better understanding of the participant teachers. At the third stage, an activity related to these three skills was given to the teachers.

The presentation of the session five also had three stages. At the first stage, the focus was on testing the understanding of the participant teachers on the three skills taught to them in session four. At the second stage, other three skills e.g. skill of explanation, stimulus variation and reinforcement were presented. The focus was on the

understanding of the skills by relating it to the skills of session four. At the third stage, an activity related to the three skills of session five was given to the participant teachers.

Activity for Session IV

"Prepare an episode in a dialogue form between teacher and students depicting/emphasizing the skill of introducing lesson, questioning and probing".

Activity for Session V

"Prepare an episode depicting the skills of explanation, reinforcement and stimulus variation. Exhibit these skills by any one of your group members in a simulated condition".

For both these activities the participating teacher were divided into two groups Each group was consisted of three teachers. After completion of their activity, one teacher from each group was asked to present the activities

4.5.5.3 Observations

The following points were observed by the researcher during this session. The observations of both the session are presented below.

1) Participant teachers were able to give response of questions put by trainer related to each skill.
2) Participating teachers clarified their doubts related to skills by asking questions immediately.
3) Participant teachers actively participated in the question answer and discussion.
4) Participant teachers completed the activity given to them and one teacher from each group presented the activity before other teachers.
5) Participant teachers along with the investigator gave their feedback to the presenter.
6) From the activity it was seemed that participant teachers understood the skills of teaching

4.5.6 Session VI: Medias of Teaching

To convey any concepts more effectively and successfully to students the teacher takes the help of some instructional aids/medias either projected or non-projected. Instructional Medias are added devices that help the teacher to clarify, establish, co-relate and co-ordinate accurate concepts, interpretation and appreciations. It enables the teacher to make learning more concrete, effective, interesting, inspirational, meaningful and vivid. The aim of teaching with technological media is clearing the channel between the learner and the things that are worth learning. As good instruction is the foundation of any educational programme, instructional media are the components of that foundation. So, appropriate use of appropriate instructional media in teaching is very much needed to make the learning interesting and effective.

4.5.6.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers know different instructional media that can be used for teaching Computer Education.
2. To enable the participating teachers understand the components and skills of using blackboard.
3. To enable the participating teachers understand the concept and use of instructional media like, chalkboard, chart, OHP, computer and LCD projector.

4.5.6.2 Procedure

The presentation of this session had three stages. At the first stage, the focus was on the understanding and the importance of instructional media and the selection of appropriate media(s) for teaching Computer Education. This stage was started with power point presentation on the importance and role played by media on present modern world

by relating it to education. At the second stage, the participant teachers were asked to give their observation(s) on presentation emphasizing on its merits and demerits. At the third stage, an activity was given to the participant teachers related to the media of teaching.

Activity

"Take a topic of your own choice from the textbook and list down the essential media needed for teaching the topic and rationalize it".

For this activity the participant teachers were divided into three groups. Each group was consisted of two teachers. The three groups selected three different topics. Each group listed down the media(s) needed for teaching that particular topic and rationalized it.

4.5.6.3 Observations

The following points were observed by the researcher during this session.

1) Participant teacher were keenly observed the presentation.
2) Individual teachers gave their observation after presentation regarding the merits and demerits of power point presentation.
3) Participant teacher, which were divided into three groups, list down the media(s) needed for teaching that particular topic and rationalized it.

4.5.7 Session VII: Classroom Environment

Effective learning largely depends upon the environment in which the learner learns. Interaction with the environment enables the learner to construct knowledge. Almost all of the educationist and psychologists have given importance for providing proper classroom environment for effective learning.

Classroom environment is visualized as a combination of physical facilities, psychological characteristics and instructional activities of a classroom set-up by teacher and students to contribute to a wholesome learning situation. The classroom environment not only depends on physical, social, emotional, educational and economical factors, but also depends upon how the students and teachers perceive the classroom situation for bringing about maximum interpersonal relationships and thereby creating an atmosphere for effective and efficient learning.

A favourable classroom environment can make the students interested and make them engaged in the classroom activities. A proper classroom environment meets the psychological needs of the students, empowers them to make choices about learning, eliminates fear of failure, allows students to establish their own standards of achievement and motivates them to participate in the learning process.

4.5.7.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the concept of classroom environment and learning process.
2. To enable the participating teachers understand the dimensions of classroom environment e g. teacher-student interaction and student-student interaction.

4.5.7.2 Procedure

The presentation of this session had two stages. At the first stage, the focus was on understanding of the concept of classroom environment and learning process; and the dimensions of classroom environment i e. teacher-student interaction and student-student interaction. At the second stage, an activity was given to them to carryout.

Activity:

"List down few practical points, which can make your classroom environment conducive"!

For this activity the participant teachers were divided into two groups. Each group consisted of three teachers. After completion of their activity, one teacher from each group was asked to present the activity.

4.5.7.3 Observations

The following points were observed by the researcher during this session.

1) At the beginning of the session, participant teachers were unable to respond about the classroom environment and its constituents.
2) Participant teachers felt free and shared the problems they encountered while interacting with the students in the class.
3) Participant teaches were able to list down few practical points to make classroom environment conducive.

4.5.8 Session VIII: Classroom Management

Classroom management is on of the important aspect pf teaching-learning process. Effective management of a classroom shows the concern of a teacher for the instructional process. It involves more than one skill of the teacher such as, creating a teaching-learning environment, maintaining student's involvement in teaching-learning activities, establishing effective discipline and ensuring desired learning out come by the students.

Classroom management refers to the shaping of learning environment in classroom. Hofmeister and Lubke (1990) said, "The primary emphasis in effective classroom management is on the creation of a learning environment and hence an increasing appropriate behaviour in students". Christian (1991) defined, "Classroom

management involves the ability of the teacher to manage various skills so that the quality of teaching learning process is maintained and it ultimately results in maximum output in terms of students performance". Thus, the major focus of classroom management is managing class in such a way that it lead to effective learning.

For effective management of classroom certain principles are to be kept in mind because principles of classroom management reflect the concern of the teacher for his teaching. There are some factors which influence the classroom management is also to be kept in mind along with certain techniques for better classroom management.

4.5.8.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the concepts of classroom management.
2. To enable the participating teachers understand various principles of classroom management.
3. To enable the participating teachers understand factors influencing classroom management.
4. To enable the participating teachers understand techniques of classroom management.

4.5.8.2 Procedure

The presentation of this session had three stages. At the first stage, the focus was on knowing the classroom management problems faced by the teachers. For this the individual teachers were asked to express their problem(s) freely related to classroom management. All participant teachers expressed their problems those are given below.

- Students do not listen to them.
- Students make noise during teaching.
- Students do not obey instruction properly in practical classes.
- Students do not do the practical work assigned to them

At the second stage, the focus was on understanding the concept of classroom management, principles of classroom management, factors influencing the classroom management and techniques of classroom management. During presentation, question-answer and discussion technique was used to have better understanding and active participation of teachers. At the third stage, an activity was given to the participant teachers to carryout.

Activity

"Apart from, the mentioned principles and techniques of classroom management what else a teacher needs to consider for making his/her classroom effectively managed."

For this the participant teachers were divided into three groups. Each group consisted of two teachers. After completion of their activity, one teacher from each group presented their points.

4.5.8.3 Observations

The following points were observed by the researcher during this session.

1) At the initial stage participant teachers did not know the principles and techniques of classroom management.
2) Participant teachers expressed the problems they were facing related to classroom management.
3) Participant teachers stated the importance and principles of classroom management after this session.
4) Participant teachers list out few points that are to be considered for effective classroom management.

4.5.9 Session IX: Methods of Teaching

The Secondary Education Commission (1952-53) rightly remarked "Even the best curriculum and the most perfect syllabus remain dead unless quickened into life by the right methods of teaching and the right kind of teachers". Method forms the most important link in the teaching learning chain, which has on the one hand the goals and purposes and on the other hand related to results. It is the middle link, which connects in an organic way the objectives with its results.

All decisions regarding teaching procedures in Computer Education need to be governed by the objectives of teaching this subject as a whole and by the specific objectives of teaching particular unit or lesson. For the achievement of comprehensive objectives of teaching Computer Education, methods used should expose the pupils to the knowledge and experiences helping in the development of understanding, critical thinking, practical skills and attitudes. So a teacher needs to have knowledge about teaching a particular subject to bring the desired outcome and methods of teaching help the teacher in this regard. Thus, a teacher should use right method(s) for teaching commuter education.

4.5.9.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers know different methods of teaching Computer Education.
2 To enable the participating teachers understand various methods of teaching computer e g. lecture method, discussion method, demonstration method, problem solving method and assignment method.

4.5.9.2 Procedure

The presentation of this session had three stages. At the first stage, the focus was on knowing participant teachers' knowledge about different methods of teaching. At the second stage, the focus was to make the participant teachers understand different methods of teaching needed for teaching Computer Education subject. In between the presentation, question-answer and discussion technique were used to make their understanding clear and clarify their doubts. At the third stage, an activity was given to participant teachers to carryout related to the methods of teaching.

Activity

"Take all the chapters of your computer textbook and state the best method(s) suitable for each chapter and rationalize it".

For this activity participant teachers were divided into two groups. Each group consists of three teachers. Group one was asked to take first three chapters of standard VIII computer textbook and second group was asked to take rest four chapters. After completion of their activity, one teacher from each group was asked to present their activity

4.5.9.3 Observations

The following points were observed by the researcher during this session.

1) At the initial stage participant teachers were able to name only two methods of teaching i e. lecture method and demonstration method.
2) At the end of the session, participant teachers were able to state importance, advantages and disadvantages of each method taught to them.
3) Participant teachers were able to state methods needed for teaching each chapter and also rationalized it.

4.5.10. Session X: Approaches of Teaching

The aim of teaching is to bring desirable change in students. This is possible, If a teacher posses good command over various methods and approaches of teaching suitable to a particular subject. In order to make students learning effective, a teacher has to adopt not only right method(s) but also right approach(s) of teaching A computer teacher needs to have command over the knowledge and skills of various teaching approaches. Many new approaches like, inductive, deductive, participatory and mastery learning approach which can help Computer Education teachers to make their teaching interesting and effective.

4.5.10.1 Objectives

Following objective was there for this session and attempt was made to achieve this objective by the participant Computer Education teachers after attending this session.

The objective is to enable the participating teachers understand various approaches of teaching Computer Education.

4.5.10.2 Procedure

The presentation of this session had two stages. At the first stage, the focus was on understanding of the concept of approaches of teaching and different approaches that can be used in teaching Computer Education. At the second stage, an activity was given to the participant teachers to carryout.

Activity:

"Take a segment of content or unit which can be best taught through deductive approach and the same content or unit with inductive approach".

For this activity the participant teachers were divided into two groups. Each group consisted of three teachers. The two groups were asked to do the activity by taking the content/unit of their own choice. After completion of their activity, one teacher from each group was asked to present the activity.

4.5.10.3 Observations

The following points were observed by the researcher during this session.

(i) At the initial stage, the participant teachers did not know about the approaches of teaching.

(ii) Participant teachers were able to state the approaches (inductive and deductive) that can be used in the teaching of the segment of content they had taken.

4.5.11 Session XI & XII: Cooperative Learning

Learning through cooperation is one of the best ways of learning. Cooperative learning is a new strategy used in teaching various subjects. It involves students in sustain learning in established groups or teams. It is a group learning or peer learning. In cooperative learning, students work together to achieve common goals or tasks. In this learning there is greater participation and involvement of the students. It generates more intrinsic motivation that leads to individualized learning. It develops team spirit among students. Cooperative learning strategy is very much useful for learning various skills. Computer Education is a subject which is more skill based in the initial stage of learning. Students use to demonstrate skill of using various commands and functions in Computer Education. So, this strategy of cooperative learning could be used effectively in teaching Computer Education

4.5.11.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the concept of cooperative learning.
2. To enable the participating teachers acquire the techniques of cooperative learning.

4.5.11.2 Procedure

The presentation of sessions XI and XII had two stages. At the first stage, the focus was on understanding the concept of cooperative learning, its key elements and the ways in which cooperative learning strategy can be used in teaching Computer Education. The presentation was carried out by interacting and discussing with the participant teachers. At the second stage, an activity was given to the participating teachers to carry out so that participants would be in a position to use the strategy while teaching Computer Education subject.

Activity

"Take a topic/unit of your choice where cooperative learning can be used and design a strategy of your own to deal the same topic with the help of cooperative learning".

For this activity the participant teachers were divided into two groups. Each group was consisted of three teachers. The two groups selected the topic/unit of their own choice and designed the strategy to deal the content through cooperative learning. One teacher from each group presented their activity.

4.5.11.3 Observations

The following points were observed by the researcher during this session.

1) Initially the participant teachers didn't have any idea about cooperative learning.
2) Participant teachers interact with trainer to know more about cooperative learning.
3) Participant teachers actively participated in the activity given to them and presented it before the group.

4.5.12 Session XIII and XIV: Models of Teaching: Advance Organizer Model

The core of teaching is the arrangement of environments within which the students can interact, so that the pre-decided objectives could be achieved effectively. In this regard, models of teaching provide greater scope for a teacher to achieve the objectives in a best possible manner. So, a model of teaching is a plan of action that can be used to shape curricula, to design instructional material and to guide instruction in the classroom and other setting. The focus of the model of teaching is to improve the instructional effectiveness in an interactive atmosphere and to improve or shape the curriculum. Advance organizer model is an important model which can be used for teaching Computer Education at school.

Advance organizer model of teaching was propounded by David P. Ausubel. Ausubel's main concern was to help the teachers organize and convey large amount of information meaningfully and effectively before students. This model strengthens the cognitive structure of the students. Ausubel believes that any subject is a chain of concepts. When it is accepted as the facts in our mind, it is settled as a chain in our mind if a new concept is presented relating it to an old concept. The presented accepted in our mind and it is settled as a chain of concepts.

In this model the teacher plays an important role. He first recalls the previous knowledge. This systematizes the subject matter in an order, and presents the topic in such a way that the students grasp it easily. Here, the teacher gives verbal instruction and

students grasp it as a whole and a chain is made in student's mind which brings meaningful verbal learning and learning becomes effective and retained for longer time.

4.5.12.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the concept of models of teaching.
2. To enable the participating teachers understand the concept of Advance Organizer Model.
3. To enable the participating teachers to use of Advance Organizer Model in teaching computer.

4.5.12.2 Procedure

These two sessions were presented simultaneously. These sessions had three stages. At the first stage the focus was on understanding the concept of model of teaching and advance organizer model, its concept, meaning and components. At the second stage, an Advance Organizer model was presented before the participating teacher which was related to science topic 'Lens'. The Advance Organizer was a CAI based programme. During this session question-answer and discussion was followed to make the participants' understanding clear. At the third stage, an activity was given to the participant teachers to carryout.

Activity

"Take a chapter from your computer textbook which is suitable to be taught with the help of Advance Organizer Model. Prepare the Advance Organizer for the topic and write the process of teaching using Advance Organizer Model".

For this activity, the participant teachers were divided into two groups. Each group consisted of three teachers. They were asked to carry out the activity. After completion of their activity, one member from each group was asked to present their activity.

4.5.12.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers observed the CAI presentation based on topic 'Lens'.
2) Initially, participant teachers found it difficult to understand the concept.
3) Participant teachers took part in the question-answer and discussion which helped them to clarify their understanding about the advanced organizer model.
4) Participant teachers actively participated in the activity given to them.
5) Participating teachers found difficulties to prepare advance organizer but after discussion with the trainer, teachers were able to prepare.

4.5.13 Session XV and XVI: Models of Teaching - Mastery Learning Model

The concept of mastery learning model was given by John B. Carol in 1936. In this new paradigm, he suggested that instruction should focus more on the time required for different students to learn the same material. He called it Learning Rate (LR). He proposed that if each student was allowed the time he needed to learn to some level and he spent the required time, then he could be expected to attain certain level It was Benjamin S. Bloom (1968) who transformed this conceptual model into an effective working model known as 'Mastery Learning'.

Mastery learning is an instructional philosophy based on the belief that all students can learn if given the appropriate amount of time and appropriate instructional opportunities. It is believed that students can achieve mastery when curricular standards are clearly articulated and defined, when assessment accurately measure the students'

progress toward performance of the objective(s) and when instructional lessons are tightly aligned to the curriculum.

Mastery learning is based on the premises like, all individuals can learn, people learn in different ways and at different rates, under favourable learning conditions the effects of individual difference approach a vanishing point and uncorrected learning errors are responsible for most of learning difficulties. There are many instructional strategies that can be used in the classroom but for teaching Computer Education through mastery learning approach model, the teacher can follow the following eight steps.

1. Determining what the students will know/learn.
2. Division of content into small teaching units, each with their own objective, assessment, and presentation of the content material.
3. Assessment of students progress (FORMATIVE EVALUATION).
4. Providing information about their learning (FEEDBACK).
5. Enrichment and Acceleration.
6. Guidance and direction to correct learning errors (CORRECTIVES).
7. Guided practice or supervision.
8. Summative evaluation.

4.5.13.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the concept of Mastery Learning.
2. To enable the participating teachers understand the steps of mastery learning model in teaching Computer Education.
3. To enable the participating teachers use of mastery learning model in teaching Computer Education.

4.5.13.2 Procedure

These two sessions were also presented simultaneously. These sessions had three stages. At the first stage the focus was on understanding of the concept and development of mastery learning model of Benjamin S. Bloom. At the second stage, the focus was on understanding the meaning, principles and steps of mastery learning and its application in teaching of Computer Education subject. At the third stage an activity was given to the participant teachers to carryout related to mastery learning model.

Activity 1

"Take all the topic of computer textbook and decide the mastery level needed for those topics and rationalize it".

Activity 2

"Design the strategy for any taken topic to achieve the targeted/decided mastery level".

For these activities the participating teachers were divided into two groups. Each group consisted of three teachers. Group one was asked to take first four chapters and second group for rest of the three chapters for the above mentioned activities. After completion of each activity, one member from each group was asked to present the activity.

4.5.13.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers found mastery learning model is an important model for teaching Computer Education.
2) Participant teachers showed keen interest in learning mastery learning model.
3) Participant teachers actively participated in the given activities.
4) One teacher from each group presented their activity and other teachers including the investigator gave their feedback relating to the activity.

4.5.14 Session XVII: Evaluation

The main purpose of classroom teaching is to influence students' behaviour in the desired direction and the desired direction is guided by the educational objectives formulated by the teacher. To realize the objectives teacher provides various learning experience. The extent to which, the objectives are being achieved or not are determined through evaluation. It helps teachers and learners to improve teaching and learning. It helps in forming the values of judgment, educational status or achievement of students. Evaluation in one form or other is inevitable in teaching-learning, as in all fields of activity of education judgments need to be made. Hence, it is desirable that teachers must acquire knowledge and understanding about concept of evaluation, approaches of evaluation and its application in classroom.

Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1) To enable the participating teachers understand the concept of evaluation.
2) To enable the participating teachers understand different types of evaluation and their use.

4.5.14.2 Procedure

The presentation of this session had three stages. At the first stage the focus was to know the participant teachers' knowledge and understanding about the concept of evaluation which they used to follow in their teaching. At the second stage, the focus was to make the participant teachers to understand the concept and approaches of evaluation, and their application in teaching learning process. At the third stage two activities was given to the participant teachers to carryout.

Activity 1

"Take any chapter from your computer textbook Prepare one long question or two to three short answer type of question and justify the type of evaluation you are doing for the student".

Activity 2

"Take any one chapter from your computer textbook which would continue for a minimum of five to seven classes. Design continuous and comprehensive evaluation for the same".

For the mentioned activities, the participant teachers were divided into two groups. Each group consists of three teachers. The groups were asked to take the chapters of their own choice and to do as required. After completion of their activities, one teacher from each group was asked to present their activity.

4.5.14.3 Observations

The following points were observed by the researcher during this session.

1) Initially participating teachers didn't have any idea about the concept of evaluation. They were equating it with examination.
2) Participating teachers actively participated during discussion about concept and approaches of evaluation.
3) Participating teachers actively participated in the activities given to them.

4.5.15 Session XVIII: Lesson Planning

Planning is essential for any human activity. Teaching has no exception to this. For teaching a particular content to students a teacher needs to plan his/her lesson. Lesson planning helps a teacher to proceed for his/her lesson in right direction. It indicates the aims to be realized by teaching a lesson, the methods to be employed and the activities to

be undertaken in the class so that it kept engaged for the realization of the aim. But general lesson planning followed at B. Ed. teacher training programme is not feasible to be followed by Computer Education teachers. So, a cognitive lesson plan was prepared by the researcher for their purpose. It is a type of planning not on the paper but at the cognitive level of the teachers.

4.5.15.1 Objectives

Following objectives were there for this session and attempt was made to achieve these objectives by the participant Computer Education teachers after attending this session.

1. To enable the participating teachers understand the importance of lesson planning in teaching.
2. To enable the participating teachers understand the different steps of lesson planning.
3. To enable the participating teachers to prepare lesson plan.

4.5.15.2 Procedure

The presentation of session XVIII had three stages. At the first stage the focus was to know the type of lesson planning if any made and followed by the participant teachers during teaching. At the second stage, the focus was to make the participant teachers understand the concept of lesson planning, types of lesson planning and cognitive lesson planning. At the third stage an activity was given to the participant teachers to carryout so that they would be in a position to use the cognitive lesson plan during teaching of Computer Education.

Activity

"Take a chapter of your own interest and prepare a model cognitive lesson plan".

For this activity the participant teachers were divided into three groups. Each group consisted of two teachers. The groups were asked to select chapters from their text book except Chapter I because a cognitive lesson plan was demonstrated by the investigator based on the content of chapter I. After completion of their activity, one member from each group was asked to present their prepared cognitive lesson plan.

4.5.15.3 Observations

The following points were observed by the researcher during this session.

1) Participant teachers told that they were not using any lesson plan during teaching of Computer Education
2) Participant teachers actively participated in preparation of cognitive lesson plan.
3) There was some mistake in the lesson plan prepared by the participant teachers which was corrected by the investigator.

4.6. REACTION OF TEACHERS TOWARDS TRAINING PROGRAMME

A five point reaction scale with thirty items was prepared by the researcher to know the reaction of participant teachers towards the training programme provided by the researcher. Following is the analysis and interpretation of the data obtained through the administration of the reaction scale for obtaining the reaction of the teachers' regarding the training programme.

Table 4.8: Frequency and Percent wise Distribution of Teachers' Reaction towards Training Programme.

S. No.	Statements	Strongly Agree		Agree		Can't Say		Disagree		Strongly Disagree.	
		F	%	F	%	F	%	F	%	F	%
1	I realized the importance of training programme for computer teachers.	5	88.33	1	16.67						
2	I understood the aims, objectives and writing instructional objectives.	3	50	3	50						
3	I understood the principles and maxims of teaching.	3	50	3	50						
4	I understood the basic skills of teaching.	4	66.67	2	33.33						
5	I am able to identify the instructional media needed for teaching computer.	5	83.33	1	16.67						
6	I realized the importance of classroom environment and knew the ways to create conducive classroom environment.	6	100								

S. No.	Statements	Strongly Agree		Agree		Can't Say		Disagree		Strongly Disagree.	
		F	%	F	%	F	%	F	%	F	%
7	I understood the methods and approaches of teaching Computer Education.	3	50	3	50						
8	I realized the importance of classroom management needed for both theory and practical Computer Education classes	5	83.33	1	16 67						
9	I understood the techniques of classroom management.	2	33.33	4	66.67						
10	I understood the concept of cooperative learning.	4	66.67	2	33.33						
11	I understood the concepts of models of teaching applicable for Computer Education teaching.	2	33.33	3	50	1	16.67				
12	I understood the Advance Organizer Model of teaching.	2	33.33	3	50	1	16.67				
13	I understood the Mastery Learning Approach model of teaching.	2	33.33	4	66.67						
14	I understood the concept of evaluation.	4	66.67	2	33 33						
15	I realized the importance of cognitive lesson planning in teaching Computer Education.	2	33.33	4	66.67						

S. No.	Statements	Strongly Agree		Agree		Can't Say		Disagree		Strongly Disagree.	
		F	%	F	%	F	%	F	%	F	%
16	I am able to prepare cognitive lesson plan.			6	100						
17	The training provided by the experts help me to understand the concepts.	5	83.33	1	13.67						
18	The languages of the experts were appropriate for me.	4	66.67	2	33.33						
19	The experts deal the content properly.	4	66.67	1	16.66	1	16.66				
20	The activities after each session helped me to practice the taught concepts.	4	66 67	1	16.66	1	16.66				
21	The activities after each session were interesting to me.	5	83 33	1	16.67						
22	The content of the training programme was comprehensive for short term training of in-service Computer Education teachers.	3	50	3	50						
23	The training material given to me was adequate.	3	50	2	33.33	1	13.67				
24	The time slot of the training programme was properly managed.	3	50	2	33.33					1	16.67
25	The time duration for each session was sufficient.	2	33.33	3	50					1	16.67
26	The media used in the training programme was adequate and proper.	4	66.67	2	33.33						

S. No.	Statements	Strongly Agree		Agree		Can't Say		Disagree		Strongly Disagree.	
		F	%	F	%	F	%	F	%	F	%
27	The arrangement during the training programme was proper.	6	100								
28	I actively participated during the training programme.	5	83.33	1	16 67						
29	The inputs of the training programme will be feasible to use in the classroom.	3	50	3	50						
30	The training programme will be useful for Computer Education teachers.	4	66.67	2	33.33						

Table 4.8 deals with the reaction of participant teachers towards the training provided to them by the researcher for teaching Computer Education effectively. The following points were derived from the said table.

- A large number of respondents i.e. 83.33 percent rated statement one i.e 'I realized the importance of training programme for computer teachers' as *'strongly agree'* and 16.67 percent of the respondents rated it as *'agree'*. This showed that the respondents were able to realize the importance of the training programme for Computer Education teachers.

- 50 percent each of the respondents rated statement two i e. 'I understood the aims, objectives and writing instructional objectives' as *'strongly agree'* as well as *'agree'*.

- 50 percent each of the respondents rated statement three i e. 'I understood the principles and maxims of teaching' as *'strongly agree'* as well as *'agree'*.

- Most of the respondents i.e. 66.67 percent rated statement four i.e. 'I understood the basic skills of teaching' as *'strongly agree'* and 33.33 percent rated it as *'agree'*.

- Most of the respondents i.e. 83.33 percent rated statement five i.e. 'I am able to identify the instructional media needed for teaching computer as *'strongly agr*ee' and 16.67 percent rated it as *'agree'*. This shows that the respondent were able to identify the instructional media needed for teaching computer.

- All the respondents rated statement six i.e. 'I realized the importance of classroom environment and knew the ways to create conducive classroom environment' as *'strongly agree'*. This shows that all the respondents were able to realize the importance of classroom environment and knew the ways to create conducive classroom environment.

- 50 percent each of the respondents rated statement seven i e. 'I understood the methods and approaches of teaching computer' as *'strongly agree'* and *'agree'* respectively. This also shows that the respondents were able to understand the methods and approaches of teaching Computer Education.

- A large portion of the respondents i e. 83.33 percent rated statement eight i e. 'I realized the importance of classroom management needed for both theory and practical computer classes' as *'strongly agree'* and 16.67 percent respondents rated it as *'agree'*. This shows that the respondents were able to realize the importance of classroom management in both theory and practical classes of Computer Education.

- 33.33 percent and 66.67 percent of the respondents rated statement nine i.e. 'I understood the techniques of classroom management' as *'strongly agree'* and *'agree'* respectively.

- A large portion of the respondent i.e. 66.67 percent rated statement number ten i.e. 'I understood the concept of cooperative learning' as 'strongly agree' and 33.33 percent respondents rated it as 'agree'. This shows that most of the respondents understood the concept of cooperative learning.

- 33.33 percent, 50 percent and 16.67 percent respondents rated statement 11 i.e. 'I understood the concepts of models of teaching applicable for computer teaching as *'strongly agree'*, 'agree' and *'cannot say'* respectively. This shows that a large number of respondents understood the concept of models of teaching applicable for computer education teaching.

- Similarly, 33.33 percent, 50 percent and 16.67 percent respondents rated statement 12 i.e. 'I understood the Advance Organizer Model of teaching' as *'strongly agree'*, *'agree'* and *'cannot say'* respectively This shows that a large portion of the respondents understood the Advance Organizer Model of teaching.

- 33.33 percent and 66.67 percent respondents rated statement 13 i.e. 'I understood the Mastery Learning Approach model of teaching' as *'strongly agree'* and *'agree'* respectively. This shows that all the respondents understood Mastery Learning Approach Model of teaching properly.

- A large portion of the respondents i.e. 66.67 percent rated statement 14 i.e 'I understood the concept of evaluation' as *'strongly agree'* and 33.33 percent of them rated it as *'agree'*. This shows that most of the respondent understood the concept of evaluation.

- 33.33 percent and 66 67 percent respondents rated statement 15 i.e. 'I realized the importance of cognitive lesson planning in teaching computer' as *'strongly agree'* and *'agree'* respectively. This shows that most of the respondent realized the importance of cognitive lesson planning in teaching Computer Education

- All the respondents i.e. 100 percent rated statement 16 i.e. 'I am able to prepare cognitive lesson plan' as *'agree'*. This shows that all the respondents were able to prepare cognitive lesson plan.

- A large portion of the respondents i.e. 83.33 percent rated statement 17 i.e. 'The training provided by the experts help me to understand the concepts' as *'strongly agree'* and 16.67 percent respondents rated it as *'agree'*. This shows that the training provided by the experts helped the respondent to understand the concepts.

- 66.67 percent and 33.33 percent respondents rated statement 18 i.e. 'The languages of the experts were appropriate for me as *'strongly agree'* and *'agree'* respectively. This shows that the languages used by the experts were appropriate for the respondents.

- 66.67 percent, 16.66 percent and 16.66 percent of the respondents rated statement 19 i.e. 'The experts deal the content properly' as *'strongly agree'*, *'agree'* and *'cannot say'* respectively. This shows that the experts deal the content properly.

- 66.67 percent, 16.66 percent and 16.66 percent of the respondents rated statement 20 i.e 'The activities after each session helped me to practice the taught concepts' as *'strongly agree'*, *'agree'* and *'cannot say'* respectively. This shows that the activities after each session helped them to practice the taught concepts.

- A large portion of the respondents i.e. 83.33 percent rated statement 21 i e. 'The activities after each session were interesting to me' as *'strongly agree'* and 16 67 percent respondents rated it as *'agree'*. This shows that the activities after each session were interesting to all the respondents.

- 50 percent respondents rated statement 22 i.e. 'The content of the training programme was comprehensive for short term training of in-service computer

teachers' as *'strongly agree'* and rest 50 percent respondents rated it as *'agree'*. This shows that the content of the training programme was comprehensive for short-term training of in-service Computer Education teachers.

- 50 percent, 33.33 percent and 16.67 percent respondents rated statement 23 i.e. 'The training material given to me was adequate' as *'strongly agree'*, *'agree'*, and *'cannot say'* respectively. This shows that a large portion of participant teachers were of the view that the training material given to them was adequate.

- 50 percent, 33.33 percent and 16.67 percent respondents rated statement 24 i.e. 'The time slot of the training programme was properly managed' as *'strongly agree'*, *'agree'* and *'strongly disagree'* respectively. This showed that almost all the respondent was of the view that the time slot of the training programme was properly managed where as one respondent was 'strongly disagree' to this statement.

- 50 percent, 33.33 percent and 16.67 percent of the respondents rated statement number 25 i.e. 'The time duration for each session was sufficient' as *'strongly agree'*, *'agree'* and *'strongly disagree'* respectively. This shows that a large portion of the respondents were of the view that time duration was sufficient where as, one respondent was 'strongly disagree' to it.

- 66.67 percent and 33.33 percent respondents rated statement 26 i.e. 'The media used in the training programme was adequate and proper' as *'strongly agree'* and *'agree'* respectively. This shows that the medias used in the training programme was adequate and proper.

- All the respondents i.e. 100 percent rated statement number 27 i.e. 'The arrangement during the training programme was proper' as *'strongly agree'*. This shows that the arrangement during the training programme was proper.

- A large portion of the respondents i.e. 88.33 percent rated statement 28 i.e. 'I actively participated during the training programme' as *'strongly agree'* and 16.67 percent respondents rated it as *'agree'*. This shows that all the respondents actively participated during the training programme.

- 50 percent of respondent rated statement 29 i.e. 'The inputs of the training programme will be feasible to use in the classroom' as *'strongly agree'* and also 50 percent respondents rated the statement as *'agree'*. This shows that the training Programme would be feasible to use in the Computer Education classroom.

- 66 67 percent and 33 33 percent respondents rated statement 30 i.e. 'The training programme will be useful for computer teachers' as *'strongly agree'* and *'agree'* respectively. This showed that the training Programme would be useful for Computer Education teachers.

The reaction of the participant teachers towards the implementation of the training programme was collected which was based on the content of the training programme; implementation of the training programme, and feasibility and usefulness of the training programme. From the reaction of the majority of the participant teachers towards the content and implementation, it was found to be good. In terms of feasibility and usefulness of the training programme for Computer Education teachers, majority of the respondents were strongly agree.

4.7 CONCLUSION

For the present study a training programme was developed for the in-service Computer Education teachers to equip them with pedagogical aspects of teaching-learning mainly related to Computer Education. From the literature survey, the researcher was not found any type of pre-service and in-service training programme for Computer Education teachers. The training programme designed and developed by the researcher was based on the literature survey, analysis of text book and the observation of theory

and practical classes. The textbook analysis was done in terms of type of chapter, required methods of teaching, approaches, models, teaching aids and type of interaction required, type of evaluation required and level of mastery learning. From the observation of theory and practical classes, it was found that Computer Education teachers were quite well versed in the knowledge of computer but they are not equipped with the pedagogy of teaching computer.

The developed training programme was implemented with the Computer Education teachers of the experimental schools for duration of nine days covering two sessions daily with duration of two hours per session with the help of researcher and experts. The training programme was consisted of 12 components like need and importance of training programme, aims and objectives and writing instructional objectives, principles and maxims of teaching, skills of teaching, instructional media, methods of teaching, approaches of teaching, classroom environment, classroom management, cooperative learning, models of teaching and evaluation and lesson planning. The training programme was based on lecture cum demonstration followed by activities and evaluation. From the reaction of the teachers towards the training programme, it was found that they realized the importance of training programme, understood the concepts and skills of teaching and developed a positive attitude towards the implementation of their learned skills and principles in their classroom teaching. Above and all the teachers were found satisfied with the training programme.