CHAPTER III

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research design involves specifying philosophical assumptions, research method, which data collection techniques to use, researcher's approach to qualitative data analysis, approach to writing up, and, if applicable, how researcher plan to publish the findings. A research design provides a road map for the entire research.

"Research design is considered as a "blueprint" for research, dealing with at least four problems: which questions to study, which data are relevant, what data to collect, and how to analyze the results." (Research Design, 2012).

This chapter presents the discussion of the research design developed to explore the aim of the study. "Research design is the plan, structure and strategy of the investigation conceived so as to obtain answers to research questions and control variances." (Kerlinger & Pedazur, 1973, p.330).

The best design depends on the research question as well as the orientation of the researcher. Every design has its positive and negative sides. Others have referred to this distinction as 'quantitative research designs' and 'qualitative research designs,' respectively. The research design qualitative, quantitative or mixed method approach.

"A quantitative approach is one in which the investigator primarily uses post-positivist claims for developing knowledge (i.e. cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories)."(Creswell, 2003, p. 19)

"A qualitative approach is one in which the inquirer often makes knowledge claims based primarily on constructivist perspectives (i.e. the multiple meanings of individual experiences, meanings socially and historically constructed, with an intent of developing a theory or pattern) or advocacy/participatory perspectives (i.e. political, issue-oriented,

collaborative or change oriented) or both."(Creswell, 2003, p. 18)[4] Qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomenon in terms of the meanings people bring to them.

3.2 METHODOLOGY OF THE STUDY

Research methodology is a science of research it explains how research is done scientifically; Methodology helps to understand not only the product of scientific study but also the process itself. The system of collecting data for research projects is known as research methodology. The data may be collected for either theoretical or practical research. Some important factors in research methodology include validity of research data, Ethics and the reliability of measures. Formulating of research questions along with sampling whether probable or non probable is followed by measurement that includes surveys and scaling, the choice of sample for investigation, the validation of tool, the collection of data, analysis of data, interpretation of data and process of inferences and generalizations.

Research methods can be classified into-

1. Historical Research Method – It is a method of investigation to discover, describe and interpret what existed in past.

2. Descriptive Research Method – It is a method of investigation to study, describe and interpret what exist at present.

3. Experimental Research Method – It is a method of investigation to derive basic relationship among phenomena under controlled conditions or to identify the conditions underlying the occurrences of a given phenomenon.

For the present research the researcher has used experimental Method.

Experimental Method - Experimental research describes the process that a researcher undergoes of controlling certain variables and manipulating others to observe if the results of the experiment reflect that the manipulations directly caused the particular outcome. This type of research differs from a descriptive study, and another one of its important aspects is the use of random assignment.

The experimental method is systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables.

According to Best John (2008:177), an experimental design is the blue print of the procedure that enables the researcher to test hypothesis by reaching valid conclusions about relationships between independent and dependent variables. Selection of particular design is based on the purpose of the experiment, the type of variable to be manipulated, and the conditions or limiting factors under which it is conducted. The design deals with such practical problem as how subjects are to be manipulated and controlled, the way of extraneous variables are controlled, how observations are made, and the type of statistical analysis to be employed in interpreting data relationships.

In the words of Mouly George (1964:326), the purpose of experimentation is to derive verified functional relationships among phenomena under controlled conditions or, more simply, to identify the conditions underlying the occurrence of a given phenomenon. From an operational point of view, it is a matter of verifying the independent variable in order to study the effect of such variation on the dependent variable.

In the strict sense, experimental research is what we call a true experiment, this is an experiment where the researcher manipulates one variable, and control/randomizes the rest of the variables. It has a control group, the subjects have been randomly assigned between the group, and the researcher only tests one effect at a time.

Characteristics of an Experimental Research:

An experimentation is to provide a meaningful solution to a problem, it is essential that the experiment contain, within itself, the means for answering its own questions- that is the experiment must be self-contained. Thus, in turn, calls for the satisfaction of basic interrelated conditions i.e. control, Randomization and Replication. Unless these conditions are fulfilled, the experiment cannot be interpreted, for it cannot eliminate the possibility that the result obtained were caused by factors other than that under investigation.

a) Control: In an experimental research, control is the basic element in experimentation. The main purpose of control is to create such an environment so that the effects of our desired variables can be measured objectively. Also, researcher has to reduce the effect of extraneous variables to the minimum, if researcher cannot completely remove it. The influences of extraneous factors that are not included in the hypothesis are prevented from operating and confusing the outcome which is to be appraised. The number of relevant variables are be controlled - chronological age, intelligence, previous background, study habits, time available for the study, the contents etc. These controlled variables are identified on the basis of related review of research study and researcher's own experience.

Ven Dalen (1966: 245) described, the investigator seeks to control variables for the following purposes:

• to isolate the determiners individually and in combinations,

• to vary them as magnitudes either singly or in combinations, and

• to describe quantitatively the extent of their expression and their interacting effects, again, either as single determiners or as combinations of determiners.

i) Achieving Isolation: To prevent a factor other than the independent variable from affecting the dependent variable, the researcher may remove the unwanted or interfering variable. or he may either keep constant its effect or equalize its presence in the experimental and control groups.

ii) Achieving Change in Magnitude: A researcher may strive not only to isolate the independent variable but also to ascertain how much effect it contributes. To achieve this objective, he must be able to vary the magnitude of the experimental variable.

iii) Achieving Quantitative Evaluation: The ultimate goal of a researcher is to express the magnitude of the variable in quantitative terms. Researcher wants to know not merely that one expression of a variable is larger or smaller than another, but precisely how much larger or smaller it is. If two variables are functionally related, he wants to state not merely that they are passively or negatively related, but rather the specific degree of relationship in terms of some numerical value.

b) Randomization: Since complete control is impossible, however, the researcher must attempt to neutralize the effect of whatever factors have not been adequately controlled by assigning the subjects at random to the various groups under comparison. A random sample is selected so that all samples of the same size have an equal chance of being selected from the entire population.

c) Replication: Despite all the careful efforts of the researcher to control the effects of extraneous variables, still some remain unidentified and uncontrolled and then influence his/her research results and conclusions. These discrepancies can be taken care of and removed through logically replicating the research study. This implies conducting a number of sub-experiments within the frame work of an overall experimental design.

The precision of an experiment involves a balance between control, randomization, and replication. Randomization is essential, without it, directional differences are likely to occur, the magnitude and direction of which are beyond interpretation.

Steps of the Experimental Method: The steps of the experimental method are essentially those of the scientific method. For the sake of clarification, they may be listed as follows Notify G. 1964:338):

Step-I Selecting and delimiting the problem: The problem amenable to experimentation generally can, and should, be converted into a hypothesis that can be verified or refuted by the experimental data. The variables to be investigated should be defined in operational terms — for example, the scores on the test of acceptable validity.

Step-II Reviewing the literature: In order to know the studies already conducted in the experimental studies and to ensure that what one is going to do is not just a repetition of the previous research work. It is always desirable for an investigator to devote some time in reviewing the related literature.

Step -III Drawing up the experimental design: While it should also include a clarification of such basic aspects of the design as the place and the duration of the experiment, this section should place primary emphasis on the questions of control, randomization, and replication. Because of the complexity of an experiment, it is generally advisable to conduct a pilot study in order to ensure the adequacy of the design.

Step-IV Defining the population: It is necessary to define the population precisely so that these can be no question about the population to which the conclusions are to apply. College sophomores as experimental subjects, for example, constitute a sample of a population that is, with respect to certain problems at least, extremely ill defined.

Step-V Carrying out the study: It is necessary here to insist on close adherence to plans, especially as they relate to the factors of control, randomization and replication. The duration of the experiment should be such that the variable under investigation is given sufficient time to promote changes that can be measured and to nullify the influence of such extraneous factors as novelty.

Step-VI Measuring the outcomes: Careful consideration must be given to the selection of the criterion on the basis of which the results are to be measured, for the fate of the experiment depends in no small measure on the fairness of the criterion used. Step-VII Analyzing and interpreting the outcomes: The investigator is concerned with the operation of the factor under study. He must be especially

sensitive to the possibility that the results of his study arose through the operation of uncontrolled extraneous factors. He must further exclude, at a given probability level, the possibility that his experimental findings are simply the result of chance. In no other area of educational research is the need for competence in statistical procedures so clearly indicated as in the analysis of experimental data as the basis for their valid interpretation.

Step-VIII Drawing up the conclusion: The conclusions of the study must be restricted to the population actually investigated, and care must be taken not to over generalize the results. The results also pertain only to the conditions under which they were derived, and since control may have distorted the natural situation, care must be taken to restrict the conclusions to the conditions actually present in the experiment.

Step-IX Reporting the Results: The study must be reported in sufficient detail so that the reader can make a judgment as to its adequacy.

The above stated steps can be used for conducting an experimental research.

Advantages of Experimentation: Among the main uses of experimentation in education are:

a) Determining and evaluating the adequacy and effectiveness of educational aims and objectives through the measurement of outcomes.

b) Serving as basis for the formulation, execution and modification of educational policies and programmes.

c) Ascertaining the effects of any change in the normal educational programmes and practices.

Precautions in Experimentation: Sharma R. A. (2007:112) suggested following precautions are to be observed in experimentation:

a) Purpose of experiment should be defined clearly in advance.

b) Experiment, control and criterion variables should also be defined clearly.

c) Great precautions be taken for the effect of intervening variables.

d) Sample should be selected carefully and appropriate sampling techniques should be used.

e) Pre and post-test should be given in the experimental situation.

f) Same criterion test should be used as pre and post-test.

g) In designing an experiment the following things should be kept in view:

• Plan

• Procedure,

• Time,

• Cost

METHODOLOGY OF THE PRESENT STUDY

For the present research the researcher has used Experimental method of educational research.

Pre-test –Post-test Equivalent Group Design has been used by the researcher.

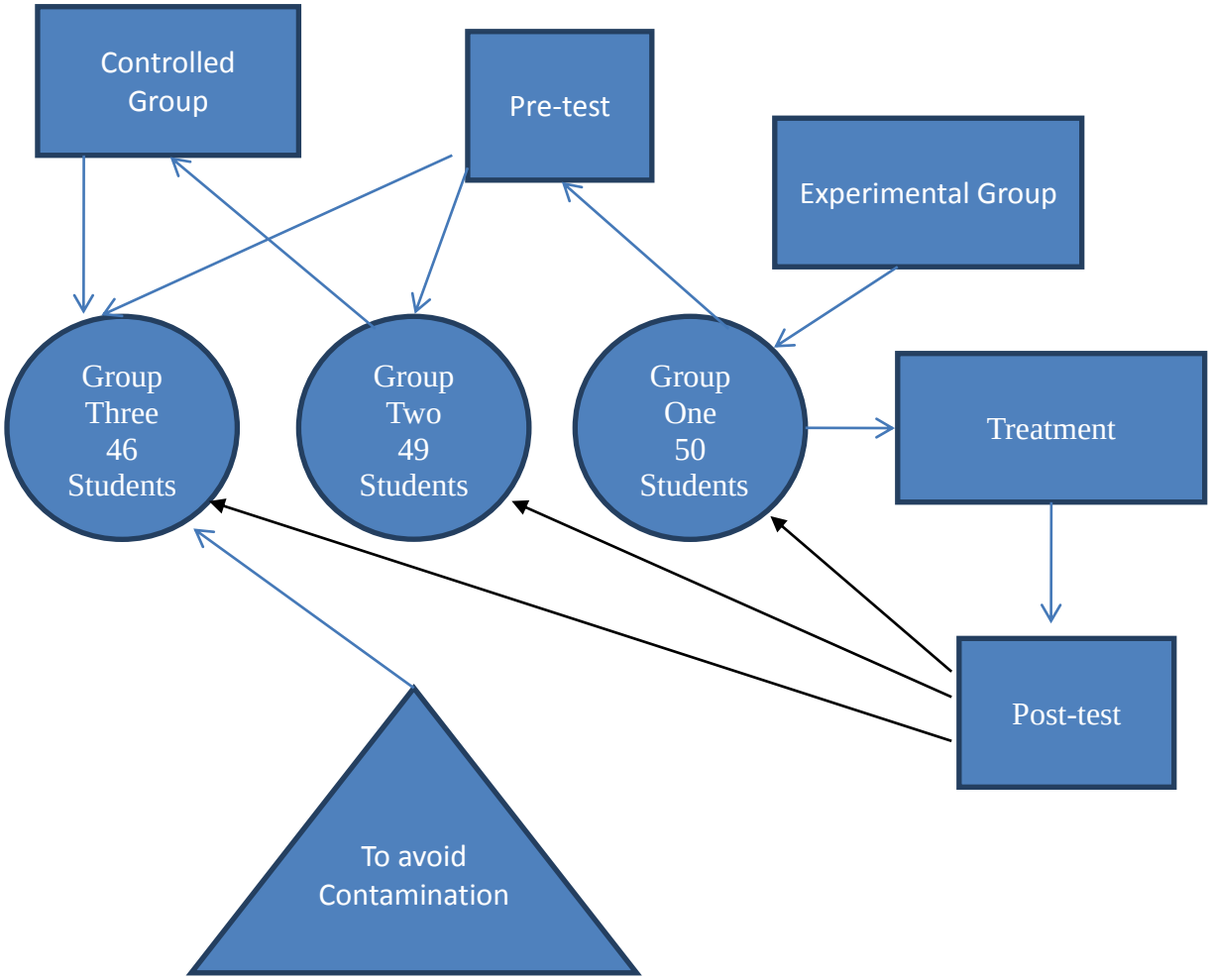
In the design-

- For the purpose of experiment two groups were formed.
- Third group was formed to avoid the contamination
- Pre-test was administered before the application of the experimental and control treatment.
- Post-test was administered at the end of treatment period.
- Pre-test scores were used in analysis of covariance to statistically control for any differences between the groups at the beginning of the study.

- To avoid the contamination third equivalent group was formed. Only pre-test & post-test was administered on this group. Inclusion of this group supported the validity & trueness of the findings.
- In the present design group three control groups were taken up for the study. This is done to do away with the contamination effect if any. The third control group was completely outside the preview of the research and allows the researcher to check the contamination of the developed ICT skill programme by comparing the scores of both the control groups. This added strength to the design and ensure reliable research findings.

Research Design

Figure-3.1 Design of the Research.



Equivalent groups formed according to following parameters.

1) For the present study Two B.Ed. Colleges were be selected with the help of Purposive sampling method.

Gokhale Education Society's College of Education & Research Parel Mumbai -12

Gurukrupa College of Education & Research Kalyan, (West)

2) All the students from the selected colleges of education were considered for the study as a sample. Among this sample three equivalent groups were formed. In order to create equivalent groups, the researcher has developed a Scale was used. On the basis of the scores of achievement, equivalent groups were created.

Sample was of 145 students from which three groups were formed as following:

- Population 200 B. Ed. Teacher Trainees
- Group 1 –Experimental Group –(50 B. Ed. Teacher Trainees)
- Group 2-Control Group 1 –(49 B. Ed. Teacher Trainees)
- Group 3 -Control Group 2–(46 B. Ed. Teacher Trainees)

Table 3.1 Design of the Study

Groups	Pre-Test	Independent variable	Post-test
Experimental	Y_1	ICT skill development programme	Y_2
Control One Control Two	Y_1	No treatment	Y_2

3.3 SAMPLING

POPULATION: Population is a group of individuals, persons, objects, or items from which samples are taken for measurement. The term Population is used in research to describe any group of individuals, events or observations in which the researcher is interested.

SAMPLE: "A sub-set of the population that should represent the entire group. A sample is a finite part of a statistical population whose properties are studied to gain information about the whole" (Webster, 1985) When dealing with people; it can be defined as a set of respondents (people) selected from a larger population for the purpose of a study.

SAMPLING: Sampling is the act, process, or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population. The purpose of sampling is to draw conclusions about populations from samples, we must use inferential statistics which enables us to determine a population`s characteristics by directly observing only a portion (or sample) of the population. We obtain a sample rather than a complete enumeration (a census) of the population for many reasons.

SAMPLING TECHNIQUES: There are two major types of sampling techniques. They are

1. **Probability Sampling –** This type of sampling results in all members of a given population have the same chance of being selected for the sample.
   Types of Probability Sampling

   i. Simple random Sampling

   ii. Systematic random Sampling

   iii. Cluster Sampling

   iv. Stratified random Sampling

2. **Non-Probability Sampling –** Non-probability sampling does not involve random selection and cannot be depend upon the rationale of probability theory, researcher may not be able to represent the population well as sample is selected according to the availability of subject.
   Types of Non-Probability Sampling

   i. Incidental Sampling

   ii. Purposive Sampling

   iii Quota Sampling

   iv. Snowball Sampling

SAMPLE OF STUDY

Sr.No.	Groups	Total No. of Students
1	Experimental group	50
2	Control Group 1	49
3	Control Group 2	46
	Total	145

No doubt, the sample is small for the result of the study to be generalized; an experimental study is normally more suitable on a small sample, as is evident from earlier investigations conducted through experimental design, which used small samples only. Krulger (1999) and Angrist and Lavy (2004) provide evidence in favour of positive and significant effect of small classes in experimental studies.

Arias and Walker (2004) conducted an experiment to test the relationship between class size and student performance. They controlled variation in instruction, lecture material, and topic coverage by using the same instructors. The result is statistically significant showing that small class size had a positive impact on student performance.

3.4 PROCEDURE FOLLOWED

Procedure of the experiment comprised of two main stages, that is, selection of the sample and conducting the experiment.

Stage1: Selection of the Sample

The sample of the study comprised of 145 Teacher Trainee of B. Ed. From Gokhale college Of Education & research Parel Mumbai & Gurukrupa college of Education & research Kalyan, West.

Selection of Experimental Group and Control Group

For the experimental group, total 50 Teacher Trainee of B.Ed. From college of Education & Research, Parel, Mumbai were chosen.

Selection of Control Group:

Two control groups consists of 49 and 46, Teacher Trainee of B.Ed. one from Gokhale education society's college Of Education & Research, Parel Mumbai & other from Gurukrupa college of Education & Research Kalyan West was chosen .No treatment was given to the control group of Trainee Teachers.

Stage2: Conducting the experiment

The experiment was conducted in three phases:

Phase I: Administration of the Pre-test Pre –test conducted for both experimental as well as controlled groups. Instructions were given to complete the task. Scores calculated after completion of Test.

Phase II: Conducting the Instructional programme

ICT SKILL DEVELOPMENT PROGRAMME

The present research involves developing and implementing an ICT Skill development programme. The programme focuses on developing awareness of and practical skills towards ICT and ascertaining its effectiveness.

The steps of developing and implementing ICT Skill development programme are as follows:

1. Identifying the components of ICT Skill development programme.
2. Designing the components and its stages.
3. Deciding the strategies i.e. the interactive teaching methods.
4. Planning the time for each component and its stages for execution.
5. Developing Modules and practical plans
6. Implementation of the ICT Skill development programme.

7. Ascertaining the effectiveness of the ICT Skill development programme.

   (Through inferential analysis)

STEPS IN DEVELOPMENT OF ICT SKILL DEVELOPMENT PROGRAMME FOR STUDENT TEACHERS

ICT SKILL DEVELOPMENT PROGRAMME *(Treatment)*

For the purpose of the study, ICT Skill development programme is defined as a plan, which is developed for training students practically with ICT skills which include the following aspects…

- To Provide ICT awareness
- To use of ICT among prospective teachers and
- To develop ICT skills.
- To check effectiveness of Programme

This programme was implemented using various interactive teaching methods such as discussion, case studies, power point presentations, showing educational video films, and group work activities.

ICT AWARENESS SCALE

For the purpose of the study computer awareness scale was implemented for selecting sample by split half method as the extent of knowledge, understanding and skills among student teachers about the following aspects…

- Basic Computer skills,
- word
- Excel,
- PowerPoint
- Database,

- Internet,
- working with mix media and
- some additional ICT skills

In that scale, total 41 items were there on basis of marks obtained in that scale., this awareness scale was also included basic information about students such as methods of teaching, computer course already done and email id.

PLANNING THE TIME FOR EACH UNITS AND STAGES FOR EXECUTION

The treatment includes conducting the ICT skill development programme for developing ICT skills and computer awareness among student teachers. The duration of conducting programme was 50 hours with 10 Modules

The following table gives the schedule of the treatment

Material and Techniques used for implementation of programme are talk and discussion with the help of Power point presentation

Total 50 Hrs training Programme

Sr. No	**Module**	**Content**	**Hours**
01	**Module 1** **MS Office skills**	Word Excel Access (data Base) Microsoft publisher (publication news letter) Paint brush Developing a desktop published document Power point presentation multimedia	**08** **(2 T+6 P)**

02	**Module 2** **File management skill**	Create and name new folders Copy, delete and rename files Types of files Zip/ unzip Complex searches for file	**03** **1T+2P**
03	**Module 3** **Internet skill**	Browser Search skill E mail	**04** **1T+3P**
04	**Module 4** **Web 2.0 skills**	Wiki Blog Website construction Web design skill Web site evaluation Teacher Tube You tube	**05** **1T+4P**
05	**Module 5** **Software Related Skill**	Installation/Un installation /run software Window /linux/ Moddle/open office CD /DVD Encarta Software evaluation skill	**03** **1 T+3P**

06	**Module 6** **Internet /computer safety skills**	Antivirus Net safety Computer safety Password management Netiquettes Plagiarism Copy right	**04** **1 T+3P**
07	**Module 7** **Online resources use skill**	Downloading Uploading Slide share Online course Online news paper Webinar Educational website Research related website Course era Shodh ganga Educational games	**08** **2T+6P**
08	**Module 8** **Peripheral Related skills/ Essential skill for Computer /Technical skills**	Basic computer Knowledge hardware software trouble shooting set up, maintains(general computing) Printer Scanner Web camera Smart phone Smart board Networking LCD projector management/smart board	**05(Used in Class Room Teaching)** **1 .30 T** **+3.30 P**

09	**Module 9** **social Networking related skills**	Whatsapp Facebook Skype Chat Video conference Forum Use of yahoo messenger G talk	**05** **1T+4P**
10	**Module 10** **Day to Day use of ICT related skills**	Net banking LIC Premiums Online payment Filling of application Gas cylinder booking IRCTC/make my trip booking /MSRTC Searching for educational seminar /conference workshop Use of various Google app Google group Project base learning skill Educational films	**05** **01.30T+3.30 P**

T Theory * P Practical

- ICT skill development Programme for B. Ed. Teacher Trainees was implemented for 50hrs in between November 2012 to January 2013. The programme is divided in to two parts one is Practical Aspects and another is Theoretical Aspects. As it is skill development programme more emphasis was given on practical part. 38 hrs out of 50 hrs were utilized for practical part and 12 hrs utilized for theoretical sessions. Before and after the implementation of programme practical and Multiple Choice Question Test was administered. Practical pre skill check and MCQ conducted in October for batch 16 to 17 students for experimental and control groups.
- Practical post skill check MCQ conducted for batch 16 to 17 students for experimental and control groups in February.
- As researcher required to verify personally ICT skill performance of teacher trainees, according to convenience of teacher trainees batch of 16 to 17 students was made. As numbers of students are less i.e. 16 to 17, it was comfortably possible for researcher to check ICT skill performance. As control group 3 was different institution it took more than one week to conduct pre and post-test skill performance. So in this way Pre-test and Post-test were administered. For MCQ of 50m Marks, one hour test was administered in a single batch.

IMPLEMENTATION OF THE ICT DEVELOPMENT PROGRAMME

PRE _TESTING OF THE EXPERIMENTAL GROUP

Sample : 50

Techniques : ICT Skill Performance check list, MCQ

Material : Computers, Paper pencil

Time allotted : 1 hour for MCQ paper

3 hours for practical

Presentation: The researcher gave the tool (50 marks) to the student and oriented them to read all the instructions carefully. The researcher requested to complete the MCQ in the allotted time only. At the end of the period the researcher collected the completed tools. And conducted practical for 150 marks so total 200 marks

PRE-TESTING OF THE CONTROL GROUP 1 and 2

Sample : 49-Group 1

: 46-Group 2

Techniques : ICT Skill Performance check list, MCQ

Material : Computers, Paper pencil

Time allotted : 1 hour for MCQ paper

3 hours for practical

Presentation: The researcher gave the tool (50 marks) to the student and oriented them to read all the instructions carefully. The researcher requested to complete the MCQ in the allotted time only. At the end of the period the researcher collected the completed tools. And conducted practical for 150 marks so total 200 marks

TREATMENT GIVEN TO EXPERIMENTAL GROUP

MODULE 1: MS Office skills

Techniques : Discussion with the help of Power Point Presentation, demonstration

Material : Power Point Presentation with Photo slides

Time allotted : 08 hours (2 T+6 P)

Objectives : - To enable the student teachers

1) To understand the **MS Office skills**

2) To use the various **MS Office skills**

Presentation: Researcher followed the following steps…

Theory and Practicum:

Step: 1 with help of power point presentation first introduced the Photo slides of **MS Office skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the following with the help of demonstration

- Word
- Excel
- Access (data Base)
- Microsoft publisher (publication news letter)
- Paint brush
- Developing a desktop published document
- Power point presentation multimedia

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **MS Office skills**

MODULE 2: File management skill

Techniques : Discussion with the help of Power Point Presentation, demonstration

Material : Power Point Presentation with Photo slides

Time allotted : 03 (1T+2P)

Objectives : - To enable the student teachers

- To understand the **File management skill**
- To use the various **File management skill**

Presentation: Researcher followed the following steps…

Theory and Practicum:

Step: 1 with help of power point presentation first introduced the Photo slides of **File management skill** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the following with the help of demonstration

- Create and name new folders
- Copy, delete and rename files
- Types of files
- Zip/ unzip
- Complex searches for file

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **File management skills**

MODULE 3 : Internet skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **04 (1T+3P)**

Objectives : - To enable the student teachers

1) To understand the **Internet skills**
2) To use the various **Internet skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Internet skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Browser
- Search skill
- E mail

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Internet skills**

MODULE 4: Web 2.0 skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **05 (1T+4P)**

Objectives : - To enable the student teachers

1) To understand the **Web 2.0 skills**
2) To use the various **Web 2.0 skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Web 2.0 skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Wiki
- Blog
- Website construction
- Web design skill
- Web site evaluation
- Teacher Tube
- You tube

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Web 2.0 skills**

MODULE 5: Software Related Skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **03 (1 T+3P)**

Objectives : - To enable the student teachers

1) To understand the **Software Related Skills**
2) To use the various **Software Related Skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Software Related Skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Installation/Un installation /run software
- Window /Linux/ Moddle/open office
- CD /DVD
- Encarta
- Software evaluation skill

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Software Related Skills**

MODULE 6 Internet /computer safety skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **04 (1 T+3P)**

Objectives: - To enable the student teachers

1) To understand the **Internet /computer safety skills**
2) To use the various **Internet /computer safety skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Internet /computer safety skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Antivirus
- Net safety
- Computer safety
- Password management
- Netiquettes
- Plagiarism
- Copy right

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Internet /computer safety skills**

MODULE 7: Online resources use skill

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **08 (2T+6P)**

Objectives : - To enable the student teachers

1) To understand the **Online resources use skill**
2) To use the various **Online resources use skill**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **online resources use skill** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Downloading
- Uploading
- Slide share
- Online course
- Online news paper
- Webinar
- Educational website
- Research related website
- Course era
- Shodh ganga
- Educational games

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Online resources use skill**

MODULE 8: Peripheral Related skills/ Essential skill for Computer /Technical skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **05 (1 .30 T +3.30)**

Objectives : - To enable the student teachers

1) To understand the **Peripheral Related skills/ Essential skill for Computer /Technical skills**
2) To use the various **Peripheral Related skills/ Essential skill for Computer /Technical skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Peripheral Related skills/ Essential skill for Computer /Technical skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

Basic computer Knowledge hardware software trouble shooting set up, maintains(general computing)

- Printer
- Scanner
- Web camera
- Smart phone
- Smart board
- Networking
- LCD projector management/smart board

Step: 4 with the help of power point presentation evaluate, summarize the entire content

and conclude the lesson. Practice above **Peripheral Related skills/ Essential skill for Computer /Technical skills**

MODULE 8: Social Networking related skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **05 (1T+4P)**

Objectives : - To enable the student teachers

1) To understand the **Peripheral Related skills/ Essential skill for Computer /Technical skills Social Networking related skills**
2) To use the various **Social Networking related skills Presentation**

Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Social Networking related skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Whatsapp
- Facebook
- Skype
- Chat
- Video conference
- Forum
- Use of yahoo messenger G talk

Step: 4 with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Social Networking related skills**

MODULE 10: Day to day related use of ICT related skills

Techniques : Discussion with the help of Power Point Presentation.

Material : Power Point Presentation with Photo slides

Time allotted : **05 (01.30T+3.30 P)**

Objectives : - To enable the student teachers

1) To understand the **Day to day related use of ICT related skills**
2) To use the various **Day to day related use of ICT related skills**

Presentation: Researcher followed the following steps…

Step: 1 with help of power point presentation first introduced the Photo slides of **Day to day related use of ICT related skills** to students.

Step: 2 Discuss with the students what message they get from the photo slides.

Step: 3 then with the help of power point presentation explains the meaning of the

- Net banking
- LIC Premiums
- Online payment
- Filling of application
- Gas cylinder booking
- IRCTC/make my trip booking /MSRTC
- Searching for educational seminar /conference workshop
- Use of various Google app
- Google group
- Project base learning skill
- Educational films
- **Step: 4** with the help of power point presentation evaluate, summarize the entire content and conclude the lesson. Practice above **Day to day related use of ICT related skills**

POST _TESTING OF THE EXPERIMENTAL GROUP

Sample : 50

Techniques : ICT Skill Performance check list, MCQ

Material : Computers, Paper pencil

Time allotted : 1 hour for MCQ paper

3 hours for practical

Presentation: The researcher gave the tool (50 marks) to the student and oriented them to read all the instructions carefully. The researcher requested to complete the MCQ in the allotted time only. At the end of the period the researcher collected the completed tools. And conducted practical for 150 marks so total 200 marks

POST-TESTING OF THE CONTROL GROUP 1 and 2

Sample : 49-Group 1

: 46-Group 2

Techniques : ICT Skill Performance check list, MCQ

Material : Computers, Paper pencil

Time allotted : 1 hour for MCQ paper

3 hours for practical

Presentation: The researcher gave the tool (50 marks) to the student and oriented them to read all the instructions carefully. The researcher requested to complete the MCQ in the allotted time only. At the end of the period the researcher collected the completed tools. And conducted practical for 150 marks so total 200 marks

Phase III: Administration of Post-test

Immediately after ICT Skill Development Program Post-test were administered for experimental and controlled groups. Scores calculated after completion of Test.

Dates and schedule treatment for Experimental Group and Pre-Test and Post-Test schedule for both Experimental and Control Group is given on Page no. 204 and 205 in Appendix F.

3.5 TOOLS

The various methods of data gathering involve the use of appropriate recording forms. These are called tools or instruments of data collection. They consist of

- Observation schedule
- Interview schedule
- Questionnaire
- Rating scale
- Checklist
- Attitude Scale
- Tests
- Document schedule/data sheet

Awareness Scale, MCQ and Checklist tools were used for a specific method of data gathering. Researcher can use readymade standardized tool for data collection, for **present study**, readymade tool was not available, so **researcher constructed tool**. For the tool constructed by researcher, validity and reliability was established and pilot study was conducted.

Development of the researcher-made tool -

To achieve objectives of the study, the data collected was statistically analyze using the following techniques:

1. Descriptive statistics such as mean and S.D worked out on the score of ICT Skill.
2. 't'test was employed for testing the significance of difference between the means of teachers trainee's achievement in ICT Skill on pre-test, post-test and gain scores.
3. t'test was employed for testing the significance of difference between the means of B. Ed. Teacher trainees on pre-test, post-test and gain scores. The value of 't' was computed with Microsoft MS Excel 2007
4. Histograms were drawn in respect of pre-test, post-test and gain scores of experimental group and control group.

3.6 CONSTRAINTS AND DIFFICULTIES FACED DURING EXPERIMENT

It may not be out of place to mention some of the difficulties faced or constraints of the experiment that needed to take note of. These, as sorted out by the researchers were:

- Power failure
- Infra structural lapses.
- Time-table related difficulties.

Efforts were needed to convince the teachers and the principal about the experiment and to seek their co-operation in the conduct of the experiment within the frame work of the college schedule. The researcher contacted the principal convinced them about the programme and its usefulness.

Selection of experimental and control 1 group was made with the help of ICT awareness skill prepared by researcher. Students were divided into experimental and control 1 group. But for control 2 group which is associated with Gurukrupa College of Education

and Research, Kalyan. Students were selected according to their interest. Awareness scale was administered to them also. Only 46 students were given positive response for pre-test and post-test. As no treatment was given to control 1 and control 2 groups. Help of some teacher educators and some active students were taken. For observation of practical activities done by students.

CONTENT VALIDITY

To ascertain content validity of the tool, the draft version of tool was given to the panel of ten experts in the field of education. The operational definition of variable was included to aid the experts in judging the content validity. The list of experts is given in Appendix A.

Those items which were agreed upon by ninety percent of the experts were retained and a few items were modified in accordance with the expert's suggestions. The content validity of the tool was thus established.

PILOT STUDY

Having finalized the tool the pilot study of present research was meant to establish the reliability coefficient of tool. The details of establishing reliability are as follows

Reliability of the tool- Reliability is concerned with level of internal consistency of the measure or its stability over the time. Reliability is the degree of consistency that the instrument or procedure demonstrate. Reliability is necessary but not sufficient condition for validity. It is said that the test must be reliable for it to be valid, but a test can be reliable and still not to be valid. To calculate the reliability, following are the four methods-

1. Test-Retest Reliability
2. Parallel form Reliability
3. Internal consistency Reliability
4. Inter Rater Reliability

In the present study the researcher ascertained the following types of reliabilities of the tool-

a. The Internal Consistency Reliability- This is used to ascertain the internal consistency of the test. There are many methods of establishing internal consistency such as split-half method, Cornbach's alpha, Spearman Brown Formula, Kunder-Richardson coefficient and Hoyt's ANOVA.

   In the present study the internal consistency reliability was ascertained using split-half method, Spearman Brown Formula and Cronbach's alpha.

b. The Test-Retest Reliability – This Reliability is expressed in terms of coefficient of stability over time. Hence scores on the first administration of a test are correlated with the scores on the second administration after a gap about three weeks.

   To ascertain the test- retest reliability the tool was administered to the students of following college. The size of sample was 10 student teachers.

   1. Gokhale Education Society's College of Education & Research Parel Mumbai -12

After a gap of three weeks, the tools were again administered to the same group; the reliability coefficients of tools were calculated using the test-retest method. Thus internal consistency reliability coefficient and test-retest reliability coefficient were calculated.

Table 3.5 shows the Reliability index coefficient for each dimension of tools

Table 3.5

Reliability index coefficient for each dimension of tools

Dimensions	**Split-Half Reliability Coefficients**	**Test-Retest Reliability Coefficients**
Check List	0.86	0.81
MCQ on ICT Skills	0.82	0.80
Awareness Scale	0.84	0,83

The values of reliability coefficient of tools are adequate, therefore the tools are said to possess the test-retest reliability and split-Half reliability. In other words it may be said that the tools prepared by researcher are valid and reliable.

Researcher administered a small programme of 15 hours to 10 teacher trainees of 2011-12 batch during December 2011 to February 2012, The objective of implementing the programme was to find out future difficulties in the ICT Skill Performance programme on the 3 modules such as MS Office skills, File management skill and Internet skill, After implementing the programme researcher found out that there was significant difference in the pretest and posttest scores, data was calculated manually with the help of excel, and the programme was modified according to the difficulties found out in this small programme such as hanging of computers, interruption in net services, absenteeism of teacher trainees due to various reasons, schedule of college, practice lessons, internship which was useful for researcher to implement the programme.

SCORING PATTERN

Table 3.6 shows the response categories and scoring pattern of ICT Awareness Scale, ICT Skill Performance checklist, MCQ on ICT Skills.

Table 3.6

Response categories and scoring pattern of tool-ICT Awareness Scale

Response categories	Scoring pattern
I don't Know	1
I can use but not confident	2
I am expert	3

Total items included in tool are 41

Table 3.7

Response categories and scoring pattern of tool-Check list

Response categories	Scoring pattern For positive statement
YES	3
NO	0

Total items included in tool are 50

Table 3.8

Response categories and scoring pattern of tool-MCQ

Response categories	Scoring pattern For positive statement
Correct	1
Incorrect	0

Total items included in tool are 50

3.7 DATA COLLECTION

Having formulated the research problem, developed a study design, Designed ICT Skill Development Programme, constructed research instruments and selected a sample, researcher then collected the data from which researcher drawn inferences and conclusions for the study.

- Those from whom information is collected or those who are studied by a researcher become participants of the study.
- Anyone who collects information for a specific purpose, adhering to the accepted code of conduct, is a researcher.

Ethical issues concerning research participants: There are many ethical issues in relation to participants of a research activity.

Data was collected from total 145 teacher trainees in which 50 from Experimental group, 49 from control 1 and 46 from control 2 group.

3.8 ANALYSIS OF DATA

For the **Descriptive Analysis** the data was analyzed using the measures of central tendency, variability, normality and probability like Mean, Median, Mode, Standard deviation, Skewness, Kurtosis. They were also represented graphically.

For the **Inferential Analysis** the hypotheses were analyzed using the appropriate statistical techniques like t-test, ANOVA in order to compare various groups for studying the differences.

3.9 CONCLUSION

The chapter presented a detailed description of research design of the study. It focused on the theoretical purpose and the rationale of selecting the methodology, sampling, tools, data collection and data analysis. The procedure of constructing tool, pilot study discussed in detail. The following chapter discusses the Descriptive and Inferential data analysis and interpretation of data.