CHAPTER I
INTRODUCTION
CHAPTER I
INTRODUCTION

1.1 BACKGROUND OF THE STUDY
1.2 STATEMENT OF THE PROBLEM
1.3 DEFINITIONS OF THE TERMS
1.4 SIGNIFICANCE OF THE STUDY
1.5 SCOPE AND DELIMITATIONS OF THE STUDY
1.6 OBJECTIVES OF THE STUDY
1.7 HYPOTHESES OF THE STUDY
1.8 RESEARCH PROCEDURE (in brief)
   A. METHODOLOGY
   B. EXPERIMENTAL DESIGN
   C. SAMPLING DESIGN OF THE STUDY
   D. TOOLS AND TECHNIQUES
   E. ANALYSIS AND INTERPRETATION OF DATA
1.9 ORGANISATION OF THE STUDY
CHAPTER I
INTRODUCTION

1.1 BACKGROUND OF THE STUDY:

Teacher education is an area which is deliberately proposed for teacher training. The teacher training institutes in our country educate teachers. Different universities had developed different courses for the training of teachers, B. Ed. course is one of them. It includes theoretical part and practicum part. B. Ed. Part I is a theory part and B. Ed. Part II is a practicum part. There are six theory courses (papers) in revised B.Ed. syllabus of Shivaji University, Kolhapur out of which Paper IV section II is of electives in which "Computer Education" is one of the electives.

The objectives of teaching "Computer Education" are as follows.

To enable the pupil-teachers to:

1. become aware of developments in computer and role of computers in Information Technology.
2. use computer hardware and software to produce educational documents.
3. use computers in the educational process.
4. use Internet for self-learning.
5. evaluate ready-made software for school subject.
6. evaluate the use of computers in Education.

It is our common observation that the theory course is taught by lectures. The teacher educators rarely use other methods of instruction. Instructional materials are also used rarely in teaching learning of the theory courses, which results in memorization for examination purpose and it is also observed that the pupil teachers forget the pedagogy and rarely apply it in their day-to-day in-service career.

Computer Education is a latest and important subject that the teachers should know. The policy of State Government of Maharashtra regarding IT is so much advanced than other states and hence IT has been introduced in
secondary schools from std. V. The government wishes to start computer awareness programmes from std. I and it will be soon introduced. Advances in computer & communication technology affected all aspects of our lives – and teacher education is of no exception. Both private and public sectors in international economies are undertaking huge efforts to build revolution in educational environment. The instructional strategies are tremendously changed because of the revolution. Now the educationists and the teachers recognized the importance of instructional media in both formal as well as informal education. The media helps in increasing the interest of students in their learning. Most of open universities are now using media to interact their remote students in their courses. New instructional media can help to increase the interest of students and teachers.

We are living in ‘Information Age’. We are bombarded by information-related technology for effective change. Integrated and quality education with good communication strategies is a need of the day for effective changes in the students.

Communication is an interactive process. Computer-based multimedia technology is a tool for communicators of all trades and an effective catalyst for change. Multimedia technology is a tool – not an end in itself – applications of multimedia technology is practically limitless and people from a wide variety of fields are encouraged to learn how to plan and develop multimedia applications in their fields of interest.

Multimedia Instruction System (MIS) is new technique that can be used at B.Ed theory instruction. Development of Multimedia Instruction System has provided new opportunities for delivering instruction in innovative ways. MIS is self-instruction strategy. The use of Multimedia Technology can make learning more interesting and enriching.

Multimedia technology is widely used in advertisement and the results are amazing. The researcher is a teacher educator working in the field since last 9 years. He is teaching “Computer Education” since last 7 years. He was using lecture method for theoretical units and completes the course of an elective “Computer Education.” He felt unsatisfied of his strategy of instruction
and hence decided to undergo a research on use of multimedia technology to instruct Computer Education itself for the pupil-teachers. He felt that the multimedia instructional system on elective subject Computer Education can be developed and store in CD-ROM which will help the pupil-teachers to learn subject at their own pace. The system can be self-learning interactive process having self-formative and summative evaluation scheme. The system can be time saving and more effective in comparison with the traditional.

1.2 STATEMENT OF THE PROBLEM

The statement of the problem for research was therefore, stated in the following words.

“Development of Multimedia Instructional System on Computer Education for B.Ed. Pupil Teachers”

1.3 DEFINITIONS OF THE TERMS

The operational definitions of the terms used in the statement of the problem are defined below for the sake of clarity and also for delimiting the scope of study as follows:

1) Development: The term development includes planning, designing, constructing and the testing of an instructional system.

2) Multimedia Instructional System: This term includes three sub terms viz. System, Instruction and Multimedia

   System: A system is self regulating self learning set of ideas, principles, methods or procedure.

   Instruction: The term instruction is limited to teaching learning and guiding the students in their development of concepts in computer education.

   Multimedia: So far this research is concerned the term is limited to the integration of multiple media – such as visual imagery, text, video, sound and animation – which together can multiply the impact of message.
Multimedia Instructional System: So far this research is concerned the term multimedia instructional system is an instructional system developed through multimedia technology.

3) Computer Education: The term Computer Education is a vast term. Here Computer Education means the introductory information of computer hardware & software, operating systems, MS-office and use of computers in Education with preliminary information of Information Technology. The term Computer Education is limited to the contents covered in the course of an elective in B.Ed syllabus revised in June 2001 of Shivaji University Kolhapur.

1.4 SIGNIFICANCE OF THE STUDY

The significance of the present study is as follows:

- As far as the knowledge of researcher in concerned, no study of such kind has been done earlier.
- The study will deeper the understanding of Computer Education course to be taught in B.Ed. colleges.
- The developed instructional system will be helpful the teacher-educators and the pupil-teachers in teaching and learning of Computer Education. The study will enable the pupil-teachers to understand the nature and purpose of Computer Education develop communication skills and enable to use modern information technology for school purposes.
- The deficiency of unavailability of multimedia CD-ROM on Computer Education will be removed to some extent. The findings will be helpful to the teacher-educators in revising the present course.
- The system will be helpful for distance learning mode and in-service training.

1.5 SCOPE AND DELIMITATIONS OF THE STUDY

1) This study is limited to an elective 'Computer Education' from B.Ed revised syllabus paper IV section II (revised from June 2001).
2) This study is restricted to following units from “Computer Education” course in B.Ed. revised syllabus of Shivaji University, Kolhapur.

Unit I: An Introduction to Computers
Unit II: Computer Hardware Functions & Applications
Unit III: Computer Software
Unit IV: Application Software for Education
Unit V: Use of Computers & Multimedia in Education

3) The development of multimedia instructional system was restricted to Marathi medium.

4) The experimental treatment is restricted to the pupil teachers admitted in College of Education, Barshi which is affiliated to Shivaji University, Kolhapur.

5) The development of a multimedia system includes designing, developing and evaluating stages. In evaluating stage, the study is confined to experimental try-out in College of Education, Barshi only.

1.6 OBJECTIVES OF THE STUDY

The study was undertaken with the following objectives:

1. to analyze the conventional approach of teaching Computer Education.
2. to plan multimedia instructional system for Computer Education.
3. to design and construct multimedia instructional system for Computer Education.
4. to test the effectiveness of constructed multimedia instructional system.
5. to compare the effectiveness of constructed multimedia instructional system with the conventional system of instruction.
6. to validate multimedia instructional system in terms of their effectiveness over conventional system of instruction.
7. to equip the pupil teachers and teacher-educators with reliable system to overcome the difficulties in instructing theory course of Computer Education.

1.7 HYPOTHESES OF THE STUDY

Following are the research hypotheses of study.

R.H.1: The present setting of teaching the elective Computer Education in B.Ed. Colleges is not satisfactory for better learning of the pupil-teachers.

R.H.2: An instructional system for Computer Education through multimedia technology can be planned, designed and constructed.

R.H.3: A) The male pupil-teachers and female pupil teachers perform differently on achievement in their groups irrespective of the system used in instructing them.

B) The male pupil-teachers perform differently on achievement irrespective of the system used in instructing them.

C) The female pupil teachers perform differently on achievement irrespective of the system used in instructing them.


R.H.5: (A) The male pupil-teachers and female pupil teachers perform differently in retention of achievement in their groups irrespective of the system used in instructing them.

B) The male pupil-teachers perform differently in retention of achievement irrespective of the system used in instructing them.

C) The female pupil teachers perform differently in retention of achievement irrespective of the system used in instructing them.

The research hypotheses R.H.3 to R.H.6 are stated below in null form for the sake of experiment and for testing purpose.

Ho.1: There is no significant difference between the performance of the pupil-teachers from control and experimental group in pretest.

Ho.2: There is no significant difference between the performance of the pupil-teachers from control and experimental group in posttest.

Ho.3: There is no significant difference between the performance of the pupil-teachers from control group in pre over posttesting.

Ho.4: There is no significant difference between the performance of the pupil-teachers from experimental group in pre over posttesting.

Ho.5: There is no significant difference between the gains in achievement in terms of scores in pre over posttest of the pupil-teachers from control and experimental group.

Ho.6: There is no significant difference between the performance of the pupil-teachers from control and experimental group in retention test.

1.8 RESEARCH PROCEDURE

The research procedure of the study is explained briefly in the following paragraphs. The details are elaborated in the chapter IV: Development of Multimedia Instructional System & Research Procedure.

A) METHODOLOGY

1. The researcher analyzed the traditional approach of teaching Computer Education used by teacher-educators. He collected the data by administering questionnaire to 48 teacher-educators in various Colleges of
Education affiliated to Shivaji University, Kolhapur. Unstructured interviews of all teacher-educators and some experts (10) are conducted to obtain further related data.

This helped the researcher to understand the present position of teaching Computer Education and helped in designing an instructional system.

The outcome of this step was a rough sketch of the instructional system.

2. The researcher planned, designed and constructed an instructional system for Computer Education. In this step goal, objectives and content of the system are defined. The application scripts are developed and are translated into outline and outlines into logic flow charts. Audio and video files production scripts and schedule are decided. Program storyboards for each screen are developed.

The outcome of this step was a complete design script of the proposed system.

3. After the planning of the multimedia application researcher constructed multimedia instructional system for Computer Education. In this production step researcher prepared Text block, 2-D & 3-D Graphics, Computer animation, audio & video files. Authoring software Macromedia Director 7 was selected accordingly and a first working model of the proposed multimedia instructional system was developed. The system was then stored on CD-ROM. The internal evaluation of a multimedia application had done within the multimedia development team. Alpha testing of the system had done on selected group of teacher-educators (Experts) to receive feedback and recommendations about the system.

4. After an internal evaluation and Alpha testing at every stage, the Prototype of the proposed system has been made ready for its testing.

5. The testing of the Prototype was an experiment called as Focus group testing or small scale try – out. It was two-group pretest – posttest experimental design. The sample was composed of forty (40) pupil-teacher having Computer Education as an elective. The control group was of 12
male pupil-teachers and 8 female pupil-teachers from Azad College of Education, Satara. The experimental group of 12 male pupil-teachers and 8 female pupil-teachers from College of Education, Barshi. A pretest is administered before the implementation of the prototype and the same test was used as posttest after the implementation of the prototype. The data is analyzed and interpreted to collect the information about the effectiveness of prototype.

6. Researcher revised and reshuffled the instructional system after a small-scale try-out.

7. Copies of revised system stored in CD-ROM are made available to a group of pupil-teachers from College of Education, Barshi called Beta testing group.

8. Beta testing of the system was also an experiment. The Solomon Four-Group Experimental Design is used. The group is evaluated by administering pre and post achievement tests.

9. The experiment was conducted within seven months, the procedure of which is explained in detail in chapter IV: Development of Multimedia Instructional System and Research Procedure.

B. EXPERIMENTAL DESIGN:

The researcher used the Pretest-Posttest Equivalent - Groups design in small-scale try-out sample (TOS). The design is explained below:

\[ R_1 \rightarrow O_1 \rightarrow X \rightarrow O_2 \]
\[ R_2 \rightarrow O_3 \rightarrow C \rightarrow O_4 \]

Where \( O_1, O_3 = \) pretest, \( X = \) Treatment (Multimedia Instructional System), \( C = \) Conventional Instructional System, \( O_2, O_4 = \) posttest.

The researcher used the Solomon Four-Group Experimental Design for Beta testing of the revised instructional system. The researcher had decided to use this design because it provided equivalency accuracy with less labor and such is a source of economy. The hypothesis formulated by the researcher can be resolved with the help of this design.
In this design:
1) Pupil-teachers were randomly assigned to four groups. There were sixteen (out of which 10 male pupil teacher and 6 female teachers) pupil-teaches in each group.
2) Two groups received the experimental treatment (X), which was implementation of the system.
3) One experimental group received a pretest (O₁).
4) Two groups (control) were not received treatment (C).
5) One control group received a pretest (O₃).
6) All four groups received posttests (O₂, O₄, O₅, O₆).

C. SAMPLING DESIGN OF THE STUDY

The researcher used following samples in his study.

- All teacher-educators teaching Computer Education in Colleges of Education affiliated to Shivaji University, Kolhapur are asked to respond the questionnaire.

- Some of the teacher-educators (10) are selected for unstructured interviews. The sample is randomized sample and it is obtained through hat sampling method.

- Sample of teacher-educators used in Alpha testing are those teacher-educators who were interviewed.

- Sample of pupil-teacher to be used in focus group testing is of 40 pupil-teachers. Out of which 20 pupil teachers from Azad College of Education, Satara and 20 pupil teachers from College of Education, Barshi which is randomly selected from the pupil-teachers, opted the course by using a table of random numbers.
• A sample of pupil teachers used in Beta testing is of 64 pupil teachers offering Computer Education as an elective. Out of which 32 pupil teachers from D.P.B. Dayanand College of Education, Solapur and 32 pupil teachers from College of Education, Barshi which is randomly selected from the pupil-teachers, opted the course by using a table of random numbers.

D. TOOLS AND TECHNIQUES

The researcher used the following tools and techniques in data collection for the present study:

1) A Questionnaire: A questionnaire was constructed and used in analysing the present system of Computer Education instruction.

2) Interview Schedule: An interview schedule for teacher-educators and experts was constructed which cover all questions related to the present and future system that is to be developed.

3) Internal Evaluation Form: Internal evaluation form was developed and used in internal evaluation of the system.

4) A Program Evaluation Form: A program evaluation form was developed and used in Alpha testing, focus group testing and Beta testing.

5) Achievement Tests [Pre and Post] for pupil-teachers: Achievement tests on Computer Education are constructed and administered on sample under study.

6) Retention Tests: The retention test on Computer Education was constructed and administered on sample under study. It was parallel forms of achievement tests used in Pre and Posttestings.

Reliability and validity of the tools are established.

E. ANALYSIS AND INTERPRETATION OF DATA

The data is analyzed with the help of statistical and non-statistical measures. The techniques of t test and F test are used to test the hypotheses.
1.9 ORGANISATION OF THE STUDY

The instructional system so developed and experimented and inferences and conclusions based on the experimentation are systematically presented in seven chapters.

Chapter I: Introduction

The chapter includes background of the research, statement of the problem, objectives of the study, hypotheses of the study, methodology and significance of the study, scope and limitations.

Chapter II: Review of the Related Literature and Studies

The chapter is devoted to the theoretical aspects of Computer Education and review of related studies.

Chapter III: Systems Approach to Multimedia Instruction

The chapter includes theoretical background of a system approach and meaning of multimedia instructional system with its developing procedure.

Chapter IV: Development of Multimedia Instructional System and Research Procedure

In this chapter the researcher explained the procedure used in the development of a multimedia instructional system, analysis and interpretation of the small scale try-out data, improvements in the prototype, experimentation procedure in Beta testing, variables in the experiment, control of experiment, research and null hypotheses of the study, experimental design, sampling design and description of the tools used in the study.

Chapter V: Analysis and Interpretation of Data Obtained in Beta Testing

The data obtained through experimentation is analysed and interpreted accordingly. The analysis and interpretation of the data in the form of tables, graphs and figures and statistical measures is elaborated in this chapter.
Chapter VI: **Discussion of Result, Conclusions and Recommendations**

The chapter includes discussion of results of the experiment and the conclusions based thereupon, which is followed by recommendations based on conclusions and topics for further research.

Chapter VII: **Summary**

The chapter is a brief summary of the study.