

CHAPTER I

INTRODUCTION

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1.1. Need and Importance of the Study :

The field of education is constantly changing one. The goal of education is the all-round development of the child. To fulfil this aim the child is exposed to various co-curricular and extracurricular activities at school. The school provides the child with a conducive and favourable environment to grow where learning is effective. There are certain obstacles which hinder the effectiveness of learning. These stumbling blocks have to be overcome, for the output to be impressive. This is when research comes to the rescue. Research provides an insight into the problem and explores various ways of dealing with the problems.

The recommendations of the National Policy on Education, 1986 to restructure the syllabi of subjects of secondary classes have been accepted by the Maharashtra State Board Secondary and Higher Secondary Education.

In view of these recommendations, a uniform course of studies for secondary schools has been prescribed in different states all over the country. With the advent of science and technology, Science is an important part of the school curriculum.¹

Man has been reaping the benefits of science. Electricity is a boon which lights our houses and helps run a variety of electrical gadgets. The world is a small place today. The students need to have an understanding regarding the development taking place in India in comparison to the other countries.

The progress of any state depends on its younger lot. Thus schools have to shoulder a great responsibility of producing Scientists, Researchers, Businessmen, Technologists etc. Therefore, the foundation of Science has to be strengthened. For the learning to be effective, the students should be subjected to the right kind of learning experiences.

Science education acquires a very eminent place in the school curriculum both at school and university

stages of education. Continuous advances in scientific and technological research has led to the growth and greater application of science in the contemporary society. Accordingly science becomes a priority area in education, both at the compulsory education level as well as the level of specialization. Science education is supposed to perform a twofold task.

1. Prime objective in the individualistic perspective is the cultivation of scientific temper which includes the spirit of inquiry, a disposition to reason. Logically and dispassionately, a habit of judging beliefs and opinions on available evidence, readiness to reject unfounded theories and principles, courage to admit facts however agreeable and unsettling they may be.
2. And finally recognise the limits of reasoning. It would also give the individuals a firm grasp of the concepts and processes of science and impart to them the ability to use the scientific method of problem solving and techniques of

observation and experimentation in handling problem of comprehension.

The rate at which the knowledge in science today gets obsolete it is essential that emphasis of science education should be on the development of abilities and dispositions of the mind rather than merely the transfer of dead subject matter.

Learning is reorganization of experience. It is not merely acquisition of information. Learning is not an addition of new experience nor is it old experiences summed up, rather it is the synthesis of old and new experiences which result in a completely new organization in the pattern of experiences.

Learning should be purposeful. The mind of an organism is not a storehouse where useful facts may be thrust into. Learning is possible only if the learner is himself active. Therefore, all the efforts of the teacher should be on motivating the child to learn. When the students are motivated, half of the business is done.

The fundamental objective of new learning is to help the pupils or students to clarify, intensify and interpret their life like experiences so that they will be more intelligently self directive when they encounter problems, situations as citizens in our society. To obtain the greatest amount of good from their school experiences boys and girls of all ages must have the opportunity to participate actively in the learning experiences.

To achieve the objectives of teaching science, every science teacher should manage his teaching process. In order to cause the children to learn, we have to arouse their enthusiasm, desire and interests and guide ~~these~~ ~~enthusiasms~~, desires and interests in the right way. Good teaching cannot be static for evergrowing children in evergrowing society. It must be developing in itself. Successful teaching is teaching that brings about effective learning. Teaching should not be restricted to completion of syllabus. The teacher should focus on the abilities, attitudes, understanding, curiosity, interest of the pupils only then learning will be effective.

Senses are the **gateways** to knowledge. If all the sensory organs are employed in the learning process, the five-fold attack may make the lesson interesting and successful. The world of education has also been greatly influenced by the increased use of technology. It has provided valuable help in improving the task of the teacher, smoothening the process of teaching - learning and enriching the goals of education.

History of the use of technology in education takes us to the stage when the subject matter became available in the form of printing material and text-books. It was soon supplemented by the use of teaching aids like blackboard, pictures, charts, models, maps, figures etc. Later with sophisticated scientific instruments mass media and educational materials were used. It brought the use of sophisticated hardware and software like radio, television, tape recorder, films, transperancies etc. in the field of education.

Today instructional media has been recognised by the teachers and educationists as indispensable, and integral components of instructional materials in both formal and informal education.

In the earlier days, the medium of instruction was one dimensional art, and effectiveness of teaching was mainly confined to the content of knowledge. A second dimension was added, when the method and knowledge of how to organise and present content, meaningfully, and formed the idea, that the most competent teacher needed to know something about the taught. The fourth and the most recent dimension has developed through interaction of mass media and people.

The task of the teacher in the present times is more complicated, challenging, more professional. The curriculum demands more thinking by the teachers and students and in a less demanding routine. There is a variety of instructional material available, offering a wide range of choice for the teachers to choose. Jean Piaget the Swiss psychologists says that the more the child has seen and heard, the more he wants to see and hear.

The teacher must learn how to use new media as a part of the modern learning system not merely to enrich but also supplement present methods of instruction. These new emerging media can transform class-room instruction into a series of rich, memorable experiences.

These experiences linger a long time in the memory of the child and reduce forgetting. To foster such experiences modern educators are helping in device new and challenging systems of instruction in which many new tools and techniques are employed for memorable, interesting presentations and explanations.

Most of the teachers teaching science still follow the traditional lecture method giving the students little chance of participation. Teachers are not even acquainted with the new instructional materials. This results in teachers failing to use media while instruction. Consequently students fail to achieve the objectives which are kept in mind while framing the curriculum and text-book.

Our national ethics requires all students regardless of physical and intellectual endowment, race, religion or socio-economic background have the right to education of optimal benefit to themselves and the society. It can be summed in the phrase ' Equality of educational opportunity ' where equality means not identical or uniform education but adaptation to abilities and needs. There

are gifted as well as retarded children. Students are provided instruction according to their capacities and capabilities. Hence selection of proper media in this study will be helpful to both high and low achievers in learning science. The instructional media that are developed and used in the study will be helpful in remediating the disabilities of the slow learners in science.

Most of the teachers are unable to use the appropriate media according to the context due to lack of knowledge about the media and their effect on learners' achievement. The investigator hopes that this study will inspire and guide the science teachers in selection of appropriate media and its effective use. The research will also acquaint the teachers to various media. It will also prove to the teachers that how teaching learning can be more effective and interesting by use of a range of media.

1.2. Importance of Media in teaching - learning :

A ' visual ' will not only attract the attention of pupils but also hold it for as long as it

appeals to the sense of sight. Class-room discipline depends largely upon how the teacher delivers the goods. Today's class-rooms are different from what it used to be in the past. There is a need of motivating the students at every level. The learners are exposed to many different kinds of experiences these days. What can make a lesson interesting ? How can a teacher teach better ? Media serves the purpose better

But the mere use of audio-visual aids does not guarantee effective learning, the aids must be adopted in the intellectual maturity and the previous experiences of the pupils. These must be integrated into class-room teaching. Those media are to be chosen which help to create the required learning experiences which are relevant to the structure of messages to be received by the learners and which allow the necessary feedback. The science teacher should also have a know-how of using different media. This decreases his dependency on others and makes teaching effective.

The following are the advantages of including media in the daily teaching of science.

1. These media stimulate the sense organs, helping in better grasping of subject matter.
2. It creates and arouses interest in the child.
3. With the help of media the teacher can give real life like learning experiences in the students and give first hand knowledge.
4. The use of media leads to a better understanding of concepts and improves imagination.
5. It helps in decreasing the rate of forgetting and helps in memorization.
6. Burden of the teacher, as far as his teaching load is concerned is reduced considerably. He has to talk less if he makes use of the different media in the class-room.
7. The various media are some sort of entertainment to the students.
8. Media enables the teacher to present and demonstrate situations and objects which otherwise could never be brought into a class-room.

1.3. Media - What does it mean and What are its characteristics and types ?

The world of education is largely influenced by the increased use of technology. Media refers to the instructional material which are intended to effect learning through means other than mere reading a printed page or listening to spoken words. Instructional materials are electronic devices which act as a bridge between the student and what he is to learn. They are simply a means of transmitting instruction.

According to Wittch and Schuller, the terms ' audio-visual materials ', ' instructional materials ', and ' educational media ' are synonymous. The term ' Media ' includes three types of instructional material-

- Audio, Visual and Audio-visual. Media refers to films, filmstrips, recordings, posters, maps, pictures, charts, radio, Television, Computer assisted instruction.²

The term Multimedia approach to teaching learning may be referred to the use of appropriate and carefully selected varieties of learning experiences.

which when presented to the learner through selected teaching strategies will reinforce and strengthen one another in such a way that the learner will achieve the predetermined objectives in an effective way. (Packiam 1986).

Teaching is not just ' imparting ' or presenting information and learning is not just hearing or parroting.

There can be two kinds of learning situations.

1. Suppose that the learner has control over media, its rate of transmission, the timing of the transmission where he can adjust the speed according to his needs or stop the presentations, repeat it again etc. Such a situation is a learner controlled situation.
2. When learner is receiving message transmitted by mass media e.g. radio or satellite television - he has to adjust to the speed of the radio speaker or has to miss some part of it. He cannot ask the

radio/T.V. to spot or repeat the message. Nor he can ask questions. In such a situation the learner has no control over media.

Characteristics of Media :

The knowledge of the various characteristics of media help the teacher to decide which of them is relevant to the learning experience he wishes to provide. The characteristics are as follows :

1. The senses they stimulate e.g. a book or a picture stimulates the eye as audio-tape stimulates the ear.
2. Message codes e.g. - a book gives verbal messages but a film gives non-verbal message also.
3. Learners control over selection and pace of transmission e.g. a programmed learning text-book is more under the learners control than a T.V.programme.

A programmed learning book or a computer programme can provide frequent feedback to the learner but a radio programme cannot do that.

Media has multiplicate power e.g. T.V. and radio programme can be attended by a large number of people but teacher's lecture can be attended by a small group. It has the power to preserve the message. A teacher's lecture is a one time affair. Producing mass media is costly and hence the programmes are aimed at a large number of learners, whereas making a poster or writing on the board is easy and can be easily made to meet the needs of a small group of people.

Classification of Media :

The science teacher must be thoroughly acquainted with the types of media available so that choice becomes easier. Media can be broadly classified into three main categories. viz.- Visual media, Audio media and Audio-visual media.

A) AUDIO :

1. Voice of (any human sender of message)
2. Gramophone records.
3. Audio tapes.
4. Stereo tapes / records.
5. Radio
6. Telephonic coversations.

- B) VISUAL (verbal) PRINT OR DUPLICATED.
1. Text-book, Supplementary books.
 2. Reference books, , encyclopaedia.
 3. Magazines, Newspapers.
 4. Documents, clippings from published materials.
 5. Duplicate written material.
- C) VISUAL (Non-projected two dimensional)
1. Messages / pictures on roll up board.
 2. Flat pictures, cut outs, flannel boards, materials or other adhesives.
 3. Maps.
 4. Posters, charts, graphs etc.
 5. Cartoons, comics etc.
- D) VISUAL (non-projected, three dimensional)
1. Models, mock-ups, display materials.
 2. Diagrams.
 3. Globes and Maps.
 4. Specimens.
 5. Puppets.

- E) VISUAL (Projected - Still):
1. Slide.
 2. Film strips.
 3. Overhead transperancies.
 4. Micro image Systems - microcard, microfilch.
- F) AUDIO-VISUAL (Projected - Motion)
1. Films.
 2. Television.
 3. Video Cassettes.
- G) Real or Stimulated Environment.
1. Laboratory.
 2. Workshops.
 3. Demonstrations (agricultural fields, zoos etc.
- H) Small groups of persons)
1. Groups discussions, Seminars.
 2. Role plays.
 3. Dramas.
 4. Games, stimulations, exercises.

I) MULTIMEDIA - Packages.

1. Slide - tape, Synchronisation.
2. Slide - tape, workbook.
3. Radio, slide or posters.
4. Films + posters + workbook.
4. Television + workbook.
6. Any of the above + introductory and summarising talk by the teacher or leader of the group.

J) NEW EMERGING MEDIA :

1. Tele Conferencing (group discussion through telephones.)
2. Calole Television.
3. Satellite T. V.
4. Computer Networking. (Internet)
5. Mini Computers / Micro Computers and word processors.

1.4. Statement of the Problem :

" Effect of Multimedia package on learners achievement in Science. "

Statement of the Problem :

1. What are the different media used for teaching science ?
2. What effect does the media have on the learners grasping skills ?
3. How can the student be helped to achieve mastery over learning skills ?
4. How can the teacher provide a memorable learning experience to the students ?
5. If it possible to provide all the required media for teaching of science ?

1.5. Operational Definitions :

Media :

" Mode of Presentation of the subject matter is called media. " ³ A combination of different media is called as multimedia package. A medium broadly conceived is any person, material or event that establishes conditions which enable the learner to acquire knowledge, skills and attitudes.

Learning :

" Learning is the acquisition of habits knowledge and attitudes. It involves new ways of doing things and it operates in an individuals attempt to overcome obstacles or to adjust to new situations. It represents progressive change in behaviour. It enables him to satisfy interests to attain goals. " ⁴

Achievement :

" It represents a progressive change in behaviour i.e. habits, knowledge and attitudes. " ⁵

1.6. Scope and Limitations of the Study :

1. The study was limited to Sweet Memories High School, Panchgani.
2. The study was limited to class VIII.
3. The study was restricted to the urban population of Panchgani.
4. Study was limited to teaching Biology.
5. The study was restricted to the cognitive structure of learning.

6. Media selected and developed were applicable to certain units and were dependent on the convenience of the investigator.

1.7. Objectives of Study :

The objectives put forward by the investigator were as follows :

1. To study and analyse the science text-book of standard VIII and find out suitable units from the text to prepare the multimedia package.
2. To prepare the cluster of multimedia package in relation to the units selected.
3. To develop tools to measure the students achievement.
4. To determine the effect of multimedia on learning efficiency of the students.
5. To recommend suitable media packages for teaching science to class VIII.
6. To develop lesson plans inclusive of the media package.

1.8. Assumptions of the Study :

The investigator made the following assumptions before commencing her study. They are listed below.

1. The various modern new emerging technological advances in the field of education were being used by the teacher during teaching of science.
2. The teachers were acquainted with all the media types and the multimedia package could be prepared for study of science for standard VIII.
3. Multimedia cluster packages certainly bring about a change in the cognitive structure of the students.
4. Different types of cluster media packages can be prepared for various units.
5. The teachers encounter certain problems during the development of media packages and also in their execution.
6. The teachers were well acquainted with the objectives of teaching science to class VIII students.

1.9. Hypotheses of the Study :

The investigator formulated the following hypotheses for the study :

1. There is no significant difference between the mean achievement of the students of group ' E ' and group ' E ' in the test based on previous knowledge.
2. The achievement of students of group ' E ' is significantly higher than that of group ' C ' after the use of multimedia package.
3. The performance of group ' E ' is significantly better than the group ' C ' after the use of flashcards activity, tape recorder and group discussion.
4. The achievement of group ' E ' is superior to group ' C ' after use of transparencies tape recorder and group discussion.
5. The performance of group ' E ' is significantly better than group ' C ' on test 4.
6. The performance of the experimental group ' E ' is significantly higher and better than the control group ' C ' in the Comprehensive unit test I due to the use of the experimental method i.e. multimedia package.

7. The performance of group ' E ' is impressive than that of group ' C ' in test 5 after the use of the multimedia package.
8. The achievement of group ' E ' is significantly better than that of group 'C' in the test 6 based on ' Types of Natural Resources. '
9. The achievement of group ' E ' is better than that of group ' C ' in test 7 after use of the experimental method.
10. The performance of experimental group ' E ' is significantly better than that of group control group ' C ' in test 8 after use of package.
11. The performance of experimental group ' E ' is significantly better than control group ' C ' after the use of multimedia package in test 9.
12. The performance of the experimental group ' is significantly better and impressive than that of control group in test 10 after the use of multimedia package.
13. The performance of the experimental group group ' E ' is significantly higher than that of control group ' C ' in Comprehensive unit test II due to the use of multimedia package.

7. The performance of group ' E ' is impressive than that of group ' C ' in test 5 after the use of the multimedia package.
8. The achievement of group ' E ' is significantly better than that of group 'C' in the test 6 based on ' Types of Natural Resources. '
9. The achievement of group ' E ' is better than that of group ' C ' in test 7 after use of the experimental method.
10. The performance of experimental group ' E ' is significantly better than that of group control group ' C ' in test 8 after use of package.
11. The performance of experimental group ' E ' is significantly better than control group ' C ' after the use of multimedia package in test 9.
12. The performance of the experimental group ' is significantly better and impressive than that of control group in test 10 after the use of multimedia package.
13. The performance of the experimental group group ' E ' is significantly higher than that of control group ' C ' in Comprehensive unit test II due to the use of multimedia package.

1.10 Report Writing :

The investigator has used the media packages, collected relevant data, analysed and interpreted the collected data and has framed conclusions based on the study and also given recommendations. All these findings are presented by the investigator in the following chapters -

1. This chapter contains the need and the importance of study, statement of the problem, objectives, scope and limitations of the study, assumptions and hypotheses of the study.
2. Review of Related Literature :
The investigator studied all the available literature connected with the study taken up by the investigator. The investigator has included all the previous material available on the topic in this chapter.
3. Methodology of Research :
This chapter provides information of the method used for research, the subject selected, the design of the sample and the tools and techniques selected for the study.

4. Analysis and Interpretation of Data :

This chapter analyses and interprets the data obtained through experimentation.

5. Summary : Conclusions and Recommendations :

In this chapter, the investigator has drawn conclusions based on study. The investigator has also given certain recommendations and suggestions for further course of action.

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