# CHAPTER - III : STATEMENT OF THE PROBLEM

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This chapter is confined to the title of the problem, objectives, hypotheses, scope, need and importance and limitations of the study.

3.1. Title of the Problem

"EFFECTIVENESS OF MULTIMEDIA BASED MODULAR APPROACH WITH SPECIAL REFERENCE TO SLOW LEARNERS"

3.2. Meaning of Certain Terms Used in the Study

Under this sub-head the meaning and definition of the key terms used in the study along with the operational definition of the investigator are listed out.

Effectiveness:

According to Oxford Dictionary (1975) effectiveness is 'being able to bring about the result intended'.

Champers Twentieth Century Dictionary (1972) defines effectiveness as 'being successful in producing a result or effect'.

As far as this study is concerned effectiveness refers to the impressive result produced in the learning of slow learners consequent to the operation of multimedia based modules. Effectiveness refers to the degree of realisation of

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educational objectives. It also refers to the degree of realisation of higher level attainment.

Module:

Subramania Pillai (1992) defines module as "a self contained and self instructional package dealing with a single conceptual unit or subject matter."

James Brown et al (1985) define modules as "the correlated units or packages of instructional materials which play prominent roles in individualised learning and independent study."

In this study, module is a self contained, suitably tested auto-instructional material. It is a learning package which contains everything needed by the student for self instruction.

Multimedia:

Chambers Twentieth Century Dictionary (1972) defines multimedia as "simultaneous presentation in one place of several visual and / or sound entertainments".

According to Turner (1985) multimedia refers to "transmitting of information to the pupils through audio and video devices rather than hierarchically from the teacher."

Dipika B. Shah (1988) defines multimedia as "more than one medium used in a single communication either sequentially or simultaneously."

According to Encyclopedia of Education "multimedia instructional system" refers to the use of appropriate and carefully selected varieties of learning experiences which, when presented to the learner through selected teaching strategies, reinforce and strengthen one another so that the learner will achieve predetermined and desired behavioural objectives.

In this study, multimedia refers to transmitting of information to the
pupils through more than one medium in a single communication either sequentially or simultaneously. Multimedia means making appeal to different senses instead of one as in the traditional method. Multimedia instructional strategy refers to the instructional strategy which incorporates minimum two or more than two media in its instructional process so as to enable the pupils to achieve predetermined and desired behavioural objectives. In this study multimedia refers to the use of judicious blend of appropriate media to teach the specified units of the subjects. The following factors were the criteria for selection of appropriate media to teach the instructional units in this study.

Task factors
Learner factors
Physical attributes
Economic factors and Instructional factors

The nature of the task undertaken, the nature of the subject earmarked for experiment, the requirements of the learners for better acquisition of informations and the feasibility and effectiveness of media in imparting informations played a decisive role in selection of appropriate media for inclusion in the multimedia approach of this study.

In this study, multimedia includes High Technology Instructional Media (HTIM) as well as Low Technology Instructional Media (LTIM). Under HTIM it includes audio and video cassettes procured from the International Educational Research Centre, New Delhi and also projector, microscope, slides, etc. available in the school. Under LTIM it includes globes, charts, pictures and other A.V. aids prepared making use of the resources locally available.

Slow Learners

While describing educationally subnormal children, the famous
educational psychologist Gulliford perceives two broad distinctions - one group of children who by nature have limited intellectual endowment are depressed and there are others whose ability is not quite so limited but who nevertheless have more difficulty in learning than average children. While the former group is termed as "Slow Learners" the latter group is called under achievers (Soundara Raja Rao and Rajaguru, 1995).

Burt (1946) defines slow learners as those students who are unable to cope with the work normally expected of their age group.

According to Ramakrishnaiah and Shivappa (1995) a slow learner is one who is unable to do the work of the class in which he is placed or even the class below that. He does not respond satisfactorily to the ordinary school curriculum and to the usual methods and procedures of the classroom teaching. He is not up to the attainment levels of the various subjects which are normal for his age or grade.

Students with IQ 80 to 90, who are traditionally labelled "dull normal" are generally slower to 'catch on' to whatever is being taught if it involves symbolic, abstract or conceptual subject matter. In the early grades in school, they most often have problems in reading and arithmetic and are labelled "slow learners". But it is really not that they learn so slowly as that they lag behind in developmental readiness to grasp the concepts that are within easy reach of the majority of their age mates. Such children will eventually grasp these basic concepts or subjects fairly easily but about a year or two later than their age mates (Jensen, 1980). So they may be called rather "slow developers" than "slow learners".

In this study slow learners are those students whose learning rate is low and who lag behind in academic achievement always scoring fail marks, especially below 25% in the test. They are the students who are unable to keep up with their age mates in academic achievement. Also, they are not up to the attainment levels
in various subjects which are normal for his age or grade. They are found weak in almost all the subjects. They remain in the lowest rung of the ladder. They are the students who have to stagger and struggle even for a pass score.

3.3. Objectives of the Study

The following are the objectives of the study.

1) To develop multimedia based modules for English, maths, science, and social science subjects of Std VIII.

2) To assess the achievement of slow learners in Std VIII when the subjects are taught through traditional lecture method.

3) To find out achievement of slow learners in Std VIII when the subjects are taught through multimedia based modular approach.

4) To find out the achievement of normal students in Std VIII when the subjects are taught through traditional lecture method.

5) To find out whether there exists any significant difference between the pre-test mean scores of the control group slow learners and experimental group slow learners.

6) To assess whether there exists any significant difference between the pre-test mean scores of control group slow learners and the normal group students.

7) To find out whether there is any significant difference between the pre-test mean scores of experimental group slow learners and the normal group students.

8) To assess whether there exists any significant difference between the pre-test and post-test mean scores of control group slow learners when the subjects are taught through traditional lecture method.

9) To find out whether there is any significant difference between the pre-
test and post-test mean scores of experimental group slow learners when the subjects are taught through multimedia based modular approach.

10) To assess whether there exists any significant difference between the pre-test and post-test mean scores of normal group students taught through traditional lecture method.

11) To find out whether there is any significant difference between the post-test mean scores of the slower learners in the experimental group and the slow learners in the control group.

12) To assess whether there exists any significant difference between the post-test mean scores of the slow learning boys and the slow learning girls in the control group taught through traditional lecture method.

13) To find out whether there is any significant difference between the post-test mean scores of the slow learning boys and the slow learning girls in the experimental group taught through multimedia based modular approach.

14) To assess whether there exists any significant difference between the post-test mean scores of the slow learners in the control group and the students in the normal group.

15) To find out whether there is any significant difference between the post-test mean scores of the slow learners in the experimental group and the students in the normal group.

16) To assess whether there exists any significant difference between the post-test and retention test mean scores of the control group slow learners.

17) To find out whether there is any significant difference between the
108 post-test and retention test mean scores of the slow learners in the experimental group.

18) To assess whether there exists any significant difference between the post-test and retention test mean scores of normal group students.

19) To assess whether there exists any significant difference between the retention test mean scores of the slow learning boys and slow learning girls in the control group.

20) To find out whether there is any significant difference between the retention test mean scores of the slow learning boys and the slow learning girls in the experimental group.

21) To assess whether there exists any significant difference between the pre-test and post-test mean scores of the experimental group slow learners in English subject.

22) To find out whether there is any significant difference between the pre-test and post-test mean scores of the experimental group slow learners in mathematics subject.

23) To assess whether there is any significant difference between the pre-test and post-test mean scores of the experimental group slow learners in science subject.

24) To find out whether there is any significant difference between the pre-test and post-test mean scores of the experimental group slow learners in social science subject.

25) To assess whether the relative effectiveness of multimedia modular approach differs from subject to subject selected for this study.

3.4. Assumptions of the Study

1) Multimedia based modules can be developed for all the subjects in
Standard VIII.

2) Multimedia based modular approach is more effective than the traditional lecture method.

3) Multimedia based modular approach enables the students in general, to score higher marks.

4) Multimedia based modular approach enables the slow learners, in particular, to score higher marks.

5) Multimedia based modular approach enables the slow learners to narrow down the gap between them and the normal students.

6) The slow learners evince a favourable attitude towards multimedia based modular approach.

3.5. Hypotheses of the Study

Keeping in view the objectives of the study, the following hypotheses are formulated for testing.

1) There exists no significant difference between the pre-test mean scores of control group slow learners and experimental group slow learners.

2) There exists significant difference between the pre-test mean scores of control group slow learners and the normal group students.

3) There exists significant difference between the pre-test mean scores of experimental group slow learners and the normal group students.

4) There exists no significant difference between the pre-test and post-test mean scores of control group slow learners when the subjects are taught through traditional lecture method.

5) There exists significant difference between the pre-test and post-test mean scores of experimental group slow learners taught through multimedia based modular approach.
6) There exists no significant difference between the pre-test and post-test mean scores of normal group students taught through traditional lecture method.

7) There exists significant difference between the post-test mean scores of the slow learners in the experimental group and the slow learners in the control group.

8) There exists significant difference between the post-test mean scores of the slow learning boys and slow learning girls in the control group.

9) There is significant difference between the post-test mean scores of the slow learning boys and slow learning girls in the experimental group.

10) There exists significant difference between the post-test mean scores of the slow learners in the control group and the students in the normal group.

11) There exists no significant difference between the post-test mean scores of the slow learners in the experimental group and the students in the normal group.

12) There is no significant difference between the post-test and retention test mean scores of the control group slow learners.

13) There exists no significant difference between the post-test and retention test mean scores of the slow learners in the experimental group.

14) There is no significant difference between the post-test and retention test mean scores of normal group students.

15) There exists significant difference between the retention test mean scores of the slow learning boys and the slow learning girls in the control group.

16) There exists significant difference between the retention test mean
scores of the slow learning boys and slow learning girls in the experimental group.

17) There exists significant difference between the pre-test and post-test mean scores of the experimental group slow learners in English subject.

18) There exists significant difference between the pre-test and post-test mean scores of the experimental group slow learners in mathematics subject.

19) There exists significant difference between the pre-test and post-test mean scores of the experimental group slow learners in science subject.

20) There exists significant difference between the pre-test and post-test mean scores of the experimental group slow learners in social science subject.

21) Relative effectiveness of multimedia based modular approach differs from subject to subject.

3.6. Scope of the Study

Multimedia is a composite of auditory and visual presentation. It can reach an audience of unlimited size. It can transmit programme content without delay from the point of origin to the point of reception. Keeping this view in mind, the primary focus of the study is to develop multimedia based modules for certain units in all the subjects of standard VIII, except Tamil. Four main constituents of multimedia are used in this study.

They are:

1) Audio Cassettes

2) Video Cassettes

3) Software for computer assisted instruction.

4) Other HTIM and LTIM available in the school.
Audio cassettes procured from the International Educational Research Centre, New Delhi, and ACE Educational Systems Pvt. Ltd., Madras, which cover most of the units, are used in this study in addition to the audio cassettes developed by the researcher covering the left out units. The instructional presentation by the teacher was recorded so as to suit the slow learners.

Likewise, the video cassettes procured from the International Educational Research Centre, New Delhi were used to provide multimedia base to the modules relevant to the particular concepts. For those units for which ready made cassettes were not available, required multimedia packages were developed by the investigator himself.

In addition to the audio and video cassettes, computer software for computer assisted instruction was also prepared. The computer assisted instruction was programmed in such a way as to promote auto learning by the slow learner at his own pace. These multimedia packages were developed with the help of concerned technical experts and subject resource persons.

Apart from the audio and video cassettes procured from different agencies and developed by the investigator, other HTIM like microscope, microslides etc., and LTIM such as colour charts, models both working and non working etc., were also used as an integral part of multimedia based modules.

Modules of all the units were given to the experimental group slow learners in the form of a Handbook so as to facilitate auto learning by the slow learners at their own pace. Teacher support system was limited to the extent of operating the multimedia packages, clarifying doubts and guiding the project works.

Three units were selected for each subject for the purpose of developing and measuring the effectiveness of multimedia based modules. Each unit was divided into two to four conceptual sub-units. For mathematics equations,
inequations, circular ring, cube and cuboid were selected for the study. For science one unit from physics i.e. magnetism, one unit from chemistry i.e. compounds of carbon and another unit from biology i.e. cellular organisations were included in the study. For social science subject one unit from history i.e. religious and social reformations, one unit from civics i.e. defence organisations in India and one unit from geography i.e. Indian forests and wild life were selected for study. For English, since language plays a more prominent role than the subject matter, sentence pattern and non-finite verbs and spoken English covering pure vowels, diphthongs and consonants were earmarked for preparation of modules.

Fifty slow learners of S.S.H.N. Higher Secondary School, Muhavoor were selected for the study. Twenty five of them constituted the experimental group while the rest formed the control group. The main focus of the study is to measure the effectiveness and advantage of multimedia based modular approach over the traditional lecture method in promoting the achievement of the slow learners in standard VIII. In addition to the pre-test and post-test, a retention test was also conducted to assess the impact of multimedia based modular approach on the retention of the slow learners. Finally, the study also aims to measure the extent to which the multimedia based modular approach enables the slow learners to cope with normal students. For this purpose, a normal group was also constituted comprising twenty five average and above average students selected from the population, from which the sample for the study was drawn.

3.7. Need and Importance of the Study

Teaching effectively is the most important of all the competencies required of a successful teacher. Since effective teaching deals with the needs, interest and abilities of pupils as individuals, it requires knowledge of the environment in which the pupil lives, the development problem he or she faces and his/her mental
abilities. It is more true so when the teacher is dealing with the slow learners. It also calls for an understanding of the learning processes essential for creating an environment where learning can take place and for making instruction so stimulating that every pupil will be motivated to learn. Stimulating pupils to think critically, independently and creatively is essential for effective teaching.

Effective teaching in any subject depends largely upon the introduction of newer methods of instruction. There is a growing need for trying out newer methods of instruction and establishing their effectiveness in teaching. Now-a-days a teacher cannot depend on any single method of teaching. The teacher has to try out several innovative methods to present the content to the students. When they are taught by innovative methods, the students are able to understand the concept, principles and content in an effective manner.

The immense knowledge explosion taking place in the world warrants newer methods of teaching. Students need unique experience in the presentation of the content. Multimedia based modular approach provides such unique experience to students. But, utmost care should be evinced in development of modules and multimedia packages which is a complex technical work.

Destiny of a nation is being shaped in her classrooms. The growing number of slow learners at all levels of our educational system warrants such a study, as this proposed one, to be undertaken for the enrichment of our teaching learning process.

Above all, human resource development should be at the focus of any research effort for a developing country like India which has abundant human resources. In the Indian system of education, it is observed that the human resources-teachers and learners, are under developed and perform less than their capabilities. The learners are under developed in the sense that they are not
achieving in tune with their capabilities. Even some of the most efficient teachers are not adequately equipped to identify and guide the underachievers and slow learners to reach their optimum levels. As a result, the institutions in turn are not able to send their products into the society as fully developed learners. To ensure this, we need a different strategy which can cater to individual differences. Multimedia-based modular approach is such a strategy.

Although much has been achieved in this field of education, there are many opportunities for experiment and research. Throughout, we have been constantly aware of the need for further investigation of the learning, thinking and adjustment of slow-learning children so that teaching methods can be precisely planned to suit their needs (Tansley and Gulliford, 1962).

Now the current trend is propagating auto learning by the learner himself at his own pace. This paved the way for CAI, CAL, etc. Here, the teacher is merely a facilitator of learning. He need not suffocate the learners with all the informations at a time. In auto learning, the learner can take his own time and he can proceed at his own pace till he completes the lesson. It is not the time but mastery learning which is the governing criterion here. This is where the multimedia-based modular approach exactly fits in.

Multimedia learning experiences represent a natural way for learning to take place. Learning can be accelerated by involving maximum number of senses. Sensory experience forms the foundation of intellectual activity within any formal school situation and learners differ in the effectiveness of their sense reception. Multimedia learning experiences have the advantage of appealing to the individual, the learner's pace, interest, and readiness.

Besides, cognition and conceptualisation depend on a chain of events which begin with the learner's perception of stimulus, be the auditory, visual, tactile
and olfactory. It is important that these initial learning experiences be accurate, dependable and understandable. Unless the learner’s initial sensory impressions are accurate, it will be impossible for them to have reliable conceptualisation and understandings. With the existing numerous kinds of aids, carefully organised presentation of information through a variety of media should occupy the learner’s conscious attention to living stimuli (Mohan & Rajeswan, 1995). This is what is precisely ensured by the multimedia based modular approach.

Multimedia based modules help to stimulate interest in learning. It economises time and effort, reduces verbalism in teaching and imparts broad education to pupils. Not only children but also adults remember facts better when the multimedia aids are used to explain the concepts. Further, multimedia based modular approach supports Paivio’s (1971) dual code theory of memory which suggests that information coded both visually and verbally is remembered better than information coded in only one of those two ways.

Instructors sometimes consider it difficult or impossible to individualise learning while carrying on group instruction. But opportunities do exist to individualise learning with group of nearly any size (James Brown et al., 1985). To do so requires systematic planning and creative uses of media sources as in modularisation.

Multimedia has come in to stay for ever to wield a greater influence in the teaching learning process. There is very urgent need to experiment the effectiveness of multimedia based modules and to assess their advantage over the traditional lecture method. In the Indian setting, studies have been made by Vardhini (1983), Krishnan (1983), Menon (1984) and Basu (1981) to prove the effectiveness of multimedia. Dhamija (1985), Hopper (1982) and Sahajahan (1980), Chelladurai (1994), Natarajan (1996) have conducted experimental studies to prove
and measure the effectiveness of modular approach. Ramar (1994), Lokanadha Reddy and Ramar (1994, 1995, 1996) have conducted experimental studies to bring to light and to measure the effectiveness of multimedia based modular approach. But, no attempt has been made to study the effectiveness of multimedia based modular approach with special reference to slow learners.

Systematic researches are, therefore, necessary to develop multimedia based modules so as to assess their effectiveness with special reference to slow learners. Also, we cannot afford to ignore the slow learners who constitute a sizeable portion of student population. The present study is an attempt to develop multimedia based modules for the use of slow learners learning in Standard VIII and to measure their effectiveness with special reference to slow learners and also to assess their advantage over the traditional lecture method.

3.8. Limitations of the Study

The limitations of the study are as follows:

1) This study is confined to the slow learners studying in standard VIII of S.S.H.N. Higher Secondary School, Muhavoor.

2) The sample consists of only 50 slow learners selected on the basis of teachers' observation, their performance in RPM and also on the basis of rate of learning.

3) For all the chosen subjects, only three units each were included for the study.

4) For English subject, only two units of language items and spoken English covering vowels, diphthongs and consonants were included in the experiment.

5) The experiment was conducted for a period of 45 working days @1½ hours per day.
6) Multimedia packages were developed based on the video shooting done in the classroom where the experiment was actually conducted by making use of the technical expertise available in the district HQ. It is to be noted that the institution where the experiment was conducted is located at a remote rural area far from the madding crowd.

7) The achievement test used in the study is a teacher made one and not a standardised one.

The methodology used in this study is presented in the forthcoming chapter.