CHAPTER-III

STATEMENT OF THE PROBLEM

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3.1. Introduction

It is often stated that a well defined problem is a half solved problem. This chapter titled “Statement of the problem” defines the problem undertaken by the investigator in concrete terms. It enumerates the objectives and the assumptions. Not only that, but also it provides the research hypotheses which give the researcher the required direction for his investigation. The hypotheses are highly indispensable in any research process to achieve defendable knowledge. It very much helps the researcher to relate theory to observation and observation to theory. Also, the hypotheses in combination with the specific objectives go a long way in enabling the investigator to identify the variables involved in the study and suggest the systematic methodological procedures that are to be employed to arrive at decisive conclusions. This chapter also deals with the scope, need and importance and delimitations of the study.
3.2. Title of the Problem

"EFFECTIVENESS OF THREE MODES OF INSTRUCTION IN INCLUSIVE EDUCATION IN ENHANCING THE ACADEMIC ACHIEVEMENT OF VARIOUS CATEGORIES OF STUDENTS IN BOTANY AT PLUS ONE LEVEL"

3.3. Operational Definition of the Terms Used in the Study

**Effectiveness**

Oxford Dictionary (1975) defines effectiveness as “being able, to bring about the result intended”. The Chambers 21st Century Dictionary (1999) defines effectiveness as “having the power to produce or provide a desired result”. According to Cambridge International Dictionary of English (1996) effectiveness is a "method of achieving something or something that produces the result intended to". Tang (1999) gives a new dimension of meaning to the term effectiveness. He defines effectiveness as “the difference between the treated and the control groups in proportion of the events of complete or almost complete overall recovery”. Chambers Twentieth Century Dictionary (1975) defines effectiveness as “being successful in producing a result or effect”.

In this study effectiveness refers to the impressive results in the learning of Botany by the plus one students consequent to the treatment of three modes of instruction. Effectiveness refers to the degree of realisation of educational objectives. It also refers to the degree of realisation of higher level attainment.

**Video Instruction**

Ramar (1996) defines video instruction as a multimedia mode of presentation intended for instant acquisition and longer retention.
R.C. Das (1993) defines video instruction as an instruction presented through video cassettes which provide for aural and visual effects.

According to Slavin (1986) video instruction is a kind of multimedia presentation which reaches from the point of origin to the point of reception with an immediate effect.

As for as this study is concerned video instruction refers to learning by students by viewing the instructional video programmes based on the units selected for the study.

**Modular Instruction**

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) defines modules as “the correlated units or packages of instructional materials which play prominent roles in individualised learning and independent study”.

According to Ramar (1996), module is a self contained, suitably tested auto-instructional material. It is a learning package, which contains everything needed by the student for self – learning.

In this study, modular instruction refers to learning by students using the modules developed by the investigator for the units selected for the study.

**Computer Assisted Instruction**

Stella (1993) defines computer assisted instruction as an instruction provided with the help of computer.
Slavin (1986) states that computer assisted instruction is an instruction provided by the computer in tutorial or drill and practice form.

Reddy & Ramar (1996) define computer assisted instruction as well planned and systematically devised instructional programme scrupulously presented by the computer on proper command by the user.

Computer Assisted Instruction in this study refers to learning of students by interacting with computer using the software specially developed for the purpose covering the units included in the study.

**Inclusive Education**

Mel Ainsco (1998) defines inclusive education as the process of increasing the participation of students in the culture, curricular and communities of local mainstream schools. It means developing the school in response to pupils’ diversity.

According to proponents of inclusive education, inclusive education means welcoming all children, without discrimination, into regular or ordinary schools. Indeed, it is a focus on creating environments responsive to the differing developmental capacities, needs, and potentials of all children. Inclusion means a shift in services from simply trying to fit the child into 'normal settings'; it is a supplemental support for their disabilities on special needs and promoting the child's overall development in an optimal setting.

Some advocates of inclusive education state that inclusive education does not mean that we should cease to identify and refer to the disabilities of the learners or to provide particular kinds of support when and where needed. It does mean that we should cease perceiving learners as all being similar because they are referred to by the same name.
In the opinion of some scholars inclusive education implies that education is about learning to live and learn together with each other. Inclusive education is a move away from labeling the student and towards creating special educational environment; concentrating or understanding better how people learn so that they can be better helped to learn; and see people with disabilities and/or learning difficulties first and foremost as learners.

Reddy, Ramar and Kusuma (2000) state that inclusive education is a process of accepting, accommodating and catering to diversities in addition to devising instruction so as to reach out to all the learners.

In this study inclusive education refers to providing instruction to the diverse categories found in the mainstream schools so as to reach them all alike. Inclusive education is accepting differences among students and accommodating instruction to individual differences found in the mainstream classrooms.

**Enhancing**

In this study enhancing means increasing the quantum of output, it also refers to the increased performance on the part of the students.

**Academic Achievement**

Oxford English Dictionary (1975) defines achievement ‘as bringing to a successful stage or accomplishing a task in a successful way’. Likewise, Webster’s College Dictionary (1995) defines achievement ‘as a thing accomplished especially by skill in a significant way’. Similarly, Slavin (1986) defines achievement ‘as a higher order of accomplishment at a significant level’.
According to Hallagan and Kauffman (1996) achievement means 'successfully doing or accomplishing a task'. They define achievement as successfully bringing about a desired result."

As for as this study is concerned academic achievement is an attainment of expected level of mastery in Botany. It means, a higher level of mastery learning made by the students and an impressive output performance evinced by them in the form of better score in botany in the achievement tests conducted at the time of experimentation.

**Botany**

According to Advanced Learner’s Dictionary of Current English (1985), Botany is the science of the structure, forms and distribution of plants.

In this study Botany refers to the selected units in plus one Botany syllabus earmarked for this experiment.

**Plus One Level**

In a 10 + 2 + 3 system of education, plus two refers to the two years course after the high school or secondary level study and before the collegiate study. It is the doorway to collegiate education in Indian system of education. Further, it is the course, which decides the students eligibility for admission to professional courses like medical, engineering, veterinary, agriculture, law etc. The first year of this higher secondary course is called plus one level. Since the plus two students i.e. the second year students of the higher secondary course would be very much preoccupied with their focussed preparation for the highly competitive public examination, the investigator had to choose his samples from the plus one classes.
3.4. Objectives of the Study

General Objectives
1. To develop modules, video packages and computer software for selected units of plus one Botany subject.
2. To find out the efficacy of these three modes of instruction in teaching Botany at plus one level.
3. To assess the advantage of these three modes of instruction in an inclusive setting over the traditional lecture method.

Specific Objectives
1. To know whether there is any significant difference in the pre-test performance of the students among the control group, experimental video group, experimental modular group and experimental CAI group.
2. To assess whether there is any significant difference in the pre-test performance among any same category of students i.e., normal students, under achievers and the low achievers in all the four groups.
3. To know whether there is any significant difference in the post-test performance among the control group, the experimental video group, experimental modular group and experimental CAI group.
4. To assess whether there is any significant difference in the post-test performance of the normal students among the control group, experimental video group, experimental modular group and experimental CAI group.
5. To find out whether there is any significant difference in the post-test performance of the under achievers among the
control group, experimental video group, experimental modular group and experimental CAI group.

6. To test whether there is any significant difference in the post-test performance of the low achievers among the control group, experimental video group, experimental modular group and experimental CAI group.

7. To find out whether there is any significant difference between the pre-test and post-test performances in respect of the control group taught through traditional lecture method, experimental video group, experimental modular group and experimental CAI group.

8. To test whether there is any significant difference between the pre-test and post-test performances in respect of each category of students i.e. normal students, under achievers and low achievers in all the four groups.

9. To know whether there exists any significant difference in the retention-test performance of the students among the control group, experimental video group, experimental modular group and experimental CAI group.

10. To assess whether there is any significant difference in the retention-test performance of the normal students among the control group, experimental video group, experimental modular group and experimental CAI group.

11. To find out whether there exists any significant difference in the retention – test performance of the under achievers among the control group, experimental video group, experimental modular group and experimental CAI group.

12. To test whether there exists any significant difference in the retention-test performance of the low achievers among
the control group, experimental video group, experimental modular group and experimental CAI group.

13. To know whether there is any significant difference in the performance of the students of all the groups between the post-test and the retention-test.

14. To examine whether there exists any significant difference in the performance of all the categories of students in all the groups, between the post-test and the retention-test.

3.5. Assumptions of the Study

1. It is possible to develop video package, learning modules and computer assisted instruction software for Botany subject prescribed for plus one level.

2. It is feasible to promote the achievement of students in Botany at plus one level by using video instruction.

3. Modular instruction may be more effective than the traditional lecture method in enhancing the achievement of students in Botany at plus one level.

4. Computer assisted instruction as a mode of instructional strategy will enhance the achievement of students in Botany at plus one level to a considerable extent.

5. Though the three modes of instruction are likely to enhance the achievement of students in Botany at plus one level, the degree of effectiveness may vary from one mode of instruction to another.
3.6. Hypotheses of the Study

1. There exists no significant difference in the pre-test performance of the students among the control group, experimental video group, experimental modular group and experimental CAI group.

2. There is no significant difference in the pre-test performance among any same category of students i.e., normal students, under achievers and low achievers in all the groups.

3. There is significant difference in the post-test performance of the students among the control group, experimental video group, experimental modular group and experimental CAI group.

4. There exists significant difference in the post-test performance of normal students, among the control group, experimental video group, experimental modular group and experimental CAI group.

5. There exists significant difference in the post-test performance of under achievers among the control group, experimental video group, experimental modular group and experimental CAI group.

6. There exists significant difference in the post-test performance of low achievers among control group, experimental video group, experimental modular group and experimental CAI group.

7. There exists significant difference between the pre-test and post-test performances in respect of control group,
experimental video group, experimental modular group and experimental CAI group.

8. There exists significant difference between the pre-test and the post-test performances in respect of each category of students i.e. normal students, under achievers and low achievers in all the four groups

9. There exists significant difference in the retention-test performance of the students among the control group, experimental video group, experimental modular group and experimental CAI group.

10. There exists significant difference in the retention-test performance of the normal students among the control group, experimental video group, experimental modular group and experimental CAI group.

11. There exists significant difference in the retention-test performance of the under achievers among control group, experimental video group, experimental modular group and experimental CAI group.

12. There is significant difference in the retention-test performance of the low achievers among control group, experimental video group, experimental modular group and experimental CAI group.

13. There is no significant difference in the performance of the students of all the groups between the post-test and the retention-test.

14. There is no significant difference in the performance of all the categories of students in all the groups between the post-test and retention-test.
3.7. **Scope of the Study**

An effective instructional strategy should cater to pupil diversities and it should reach out to all learners. The existing mode of instruction i.e., the traditional lecture does not rise to the occasion. It does not cater to individual differences and pupil diversities to a great extent. Also, the current trend is learner centred mode of instruction. With these views in mind, the video instruction, modular instruction and computer assisted instruction are earmarked for the study to verify the effectiveness of these modes with reference to different categories of pupils in an inclusive setting.

These modes cater to pupil diversities i.e. low achievers, under achievers and normal students. Low achievers in the rural area include mostly socially disadvantaged students, culturally affected, socio-economically backward, slow learners, students with mild learning disability and students with manageable handicaps. The proposed modes of instruction can accommodate the above pupil diversities. Moreover, these proposed modes of instruction are mostly learner centred and they cater to auto instruction to a great extent. They ensure student participation in a better way and provide for overcoming barriers to learning.

Keeping this efficacy in mind, required, video cassettes were procured from District Science Centre, Tirunelveli and International Educational Research Centre, New Delhi. These Video cassettes in addition to the video cassettes developed by the investigator were used for instructional presentation to experimental video group. Modules were developed and validated for the units selected for the study. Modules of all the units were given to the experimental modular group students in the form of a handbook, so as to facilitate auto learning by the students. Teacher support system was limited to the extent of clarifying doubts and guiding the project works. As for computer assisted instruction, commercial softwares were procured from Bangalore covering the units selected for the study. These
software along with the ones developed by the investigator were made available for experimental CAI group students for learning selected subject units.

Hundred students from South Street Hindu Nadar Higher Secondary School Muhavur in Virudhunagar District, Tamilnadu, were selected for the study. They were classified into four matching groups. The first group was experimental group-I, which was taught through video instruction. The experimental group-II was taught through modular instruction. The experimental group-III was taught through computer assisted instruction and the last group was control group and it was taught through traditional lecture method.

3.8. 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 under achievers and low achievers. 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 new 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. The students are able to understand the concept, principles and content in an effective manner when the innovative newer methods are incorporated in the teaching learning process.
The immense knowledge explosion taking place in the world warrants newer methods of teaching. Students need unique experience, which is provided in the three modes of instruction selected for the study.

Destiny of a nation is being shaped in her classrooms. The growing number of under achievers and low achievers 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 under achievers and low achievers 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, video instruction, modular instruction and computer assisted instruction are some new strategies which can be applied to various categories of students.

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 method 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 information 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 proposed three modes of instruction exactly fit in.

Video instruction represents a natural way for learning to take place involving maximum number of senses. It can accelerate learning. Sensory experience forms the foundation of intellectual activity within any formal school situation and learners differ in the effectiveness of their sense reception. Video instruction has the advantage of appealing to the learners by arousing 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 experience be accurate, dependable and understandable. Unless the learners' 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. This is what is precisely ensured by the proposed three modes of instruction.

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, the proposed three modes of instruction support Paivio's (1991) dual code theory of memory which suggests that information coded both visually and verbally is remembered better than information coded in only 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.

Computer Assisted Instruction has come in to stay for ever to wield greater influence in the teaching-learning process. There is very urgent need to experiment the efficacy of computer-assisted instruction and to assess its advantage over the traditional lecture method. No doubt, computer-assisted instruction has a motivating quality of its own.


Though the efficacy of the above modes have been established with reference to some category or other, the relative effectiveness of these modes of instruction with reference to various categories of pupils in an inclusive setting is yet to tried and tested. As catering to pupil diversity as well as reaching out to all learners is the vital principal of inclusive education, a beginning in this regard is to be made immediately on top priority basis.
Systematic researches, are therefore, necessary to assess the efficacy of different modes of instruction so that educational technology can be brought into actual inclusive classroom practice. The present study is an attempt to assess the efficacy of video instruction, modular instruction and computer assisted instruction in teaching Botany at plus one level, and also to measure their relative effectiveness in inclusive classroom and their advantage over the traditional lecture method.

3.9. Delimitations of the Study

The limitations of the study are as follows:

i) The study is confined to the plus one students studying in South Street Hindu Nadar Higher Secondary School, Muhavur Virudhunagar district of Tamil Nadu state.

ii) The sample consists of 100 students at the rate of 25 for each group selected on the basis of systematic purposive random sampling.

iii) Only two units in plus one Botany syllabus i.e. Biodiversity and Cell biology have been included for this study.

iv) The experiment was conducted for a period of 45 days at the rate of one hour per day.

v) The video cassettes were procured from District Science Centre, Tirunelveli and International Educational Research Centre, New Delhi. For the units not covered by the commercial video cassettes, the investigator developed his own video cassettes using the expertise and technology locally available.

vi) For the computer assisted instruction, commercially available computer assisted instruction software and the
CAI software developed by the researcher were used for the experiment. They were used in the Botany Laboratory where the experiment was actually carried out. The experimental CAI group students were not permitted to take them home to avoid the students in other groups using the said software which would distort the result.

vii) As for the modules, they were developed and validated by the investigator himself covering the selected units.

viii) The achievement test used in the study is a teacher made one with its own validity and reliability.