CHAPTER 1

INTRODUCTION

1.0 Background of the Study

2.0 Mastery Learning -
   A potent Instructional Strategy

3.0 Need and Significance of the Study

4.0 The Statement of the Problem

5.0 Definition of Key Terms

6.0 Objectives of the Study

7.0 Hypotheses

8.0 Scope and Limitations of the Study

9.0 Organisation of the Report
INTRODUCTION

1.0 Background of the Study

A developing country, India is trying its best to cope with other nations in every field of development. As a nation we have moved from the agricultural age to the information age in less than 100 years. Changes are taking place rapidly in the economic arena due to advances in technology. However, similar changes have yet to be made in education. Since education is the most potent instrument for the progress of a nation, the quality of education has to be improved. It is universally acknowledged that any attempt at the improvement in the quality of education is ultimately dependent on the quality of instruction imparted in the classroom.

Due to knowledge and population explosion, students coming from different areas, having different socio economic status, aptitude, interest, attitude etc sit in the same classroom. Among them some are slow learners and some are fast learners. Most of the time teachers teach for the average neglecting the above average and below average, in their hurry to finish the syllabus. According to secondary education commission (1953),
"The present practice of mechanically applying the same methods to dull, average, as well as bright children is responsible for much of the ineffectiveness of the instructions given in schools". In the classroom, the above average feel bored and the slow learners remain passive and day-by-day they become poor in the subject.

It is believed that students are normally distributed with respect to their attributes like intelligence, aptitude and other personality traits. Similarly, it is also believed that students are normally distributed with respect to their achievement in any field of learning. We expect about 10 percent to achieve top ranks and are quite prepared for an equal proportion to fail. Despite great advances in knowledge about student learning and the investment of tremendous amount of time, effort and money, our schools still have not moved very far toward the goal of increased learning for all students. Present policies and practices continue to reproduce the same normal achievement distribution in the learning of students.

The normal curve is not sacred. Bloom (1971) stressed that since education is a purposeful activity and student achievement is not the outcome of a random process, student achievement distribution should be very different from normal. But even though we think in terms of normal distribution, it is clear that at least 65
to 70 percent of students should be capable of passing examinations. But when the percentage of pass at any of the Board or University examinations is reported in the newspapers, it is observed that the figure does not cross fifty percent. This shows that we are branding 50 percent of students as failures, which is by no means educationally acceptable. It can only be concluded that educational institutions are not functioning as efficiently as expected to.

According to Bloom (1971) “Each teacher begins a new term or course with the expectation that about a third of his students will adequately learn what he has to teach. He expects a third of his students to fail or to just get by. Finally he expects another third to learn a good deal of what he has to teach, but not enough to be regarded as good students. This set of expectations, which fixes the academic goals of teachers and students, is the most wasteful and destructive aspect of the present educational system. It reduces the aspirations of both the teachers and the students”.

If school learning is regarded as frustrating and unattainable by a large proportion of students, then little can be done at later levels to create a genuine interest in further learning. Research evidences indicate a strong, causal link between the pupil’s history of school learning success or failure and his personality
development. A student's learning requirements tend to cause the development of a negative self concept at least in the academic arena. Further, for about 20 percent of all students' repeated frustration, humiliation and despair engendered by their inability to meet these requirements may cause mental health problems (Bloom, 1971).

Research evidences show that failures of large magnitude, high dropout and stagnation rate etc may occur because of accumulated learning deficits brought about by one important factor - a non-insistence on mastery of materials learnt at each of the earlier stages. What is imperative, then, is an innovative proposal for change, a significant departure from current practice, a re-direction of education for the 21st century.

2.0 Mastery Learning – A potent Instructional Strategy

Mastery learning is an alternative method of teaching and learning that involves the student reaching a predetermined mastery on units of instruction before being allowed to progress to the next unit. The concept of “Mastery Learning” is not new; it was introduced into western education over 70 years ago. Washburne (1922), Morrison (1926), Carroll (1963), Bloom (1971) are the major
proponents of this. The concept of mastery is explained theoretically by Carroll (1963) and transformed into a learning strategy by Bloom (1971). It is a process whereby students achieve the same level of content mastery but at different time intervals. Students are given specific feedback about their learning progress at regular intervals throughout the instructional period. This feedback helps students identify what they have learned well and what they have not learned well. Areas that were not learned well are allotted more time to achieve mastery. Conventional instruction holds time constant and allows mastery to vary while mastery learning holds mastery constant and allows time to vary.

The mastery learning starts with the assumption that almost all students can and will master a great deal of what is taught if instruction is given systematically, their learning difficulties are diagnosed at the right time, the students are helped when and where they have learning difficulties, they are given sufficient time to achieve mastery and there is some clear criterion of what constitutes mastery. Studies conducted by Block (1971, 1974) indicate that in many subject areas, all students can achieve some defined level of mastery.
2.1 Approaches to Mastery Learning Strategy

Two genotype approaches to the use of mastery learning strategy currently exist. The first is a group based, teacher-paced approach. Students learn co-operatively with their classmates and the teacher controls the delivery and flow of instruction. The prototype for this approach is Bloom's learning for mastery. This approach has evolved from within the field of education. Group based mastery learning (Block and Anderson, 1975) has had a major impact at the elementary and secondary levels of schooling.

The second approach is individual based and learner paced. Students learn independently of their classmates and each student controls the delivery and flow of instruction. Ideas and practices related to this approach lie at the heart of Keller's personalised system of instruction (Keller, 1968). This approach evolved from the field of psychology and biology and had its impact at the college and university levels.

In the present study, group based mastery learning has been followed. A detailed description of mastery learning strategy is given in chapter II.
3.0 Need and Significance of the Study

Today, qualitative improvement of education is of great importance and it can be achieved only by improving the quality of instruction. Even though great advancements in science as well as educational technology are made in our country, the methods of teaching prevalent are not significant to meet the requirements of students at all levels. Several studies on classroom practices reveal that even though the student characteristics and societal expectations have changed, our educators still employ those traditional methods and modes of instruction. The tragic irony is that we know how to make learning more effective for more students, we have powerful, new learning tools to assist us, and we have ample research paradigms that suggest effective new learning techniques. Yet, to a large degree, we continue to teach as our grandparents were taught. To train reflective and totally active world citizens many of our traditional educational practices must be seriously questioned and novel approaches based on sound objectives must be implemented. Hence, it is necessary to refine and improve the teaching methods and instructional techniques to realize the fullest potentialities of individual learner.

Education, for all its remarkable achievements in this country, still is largely unable to accommodate individual student
learning needs and to achieve acceptable levels of individual student mastery, proficiency and expertise.

Article 45 of our constitution envisages free and compulsory education for all the children up to the age 14. But wastage and stagnation remains as a powerful hindrance in the way of universalisation of elementary education. In our country where there is high incidence of failure in schools, a strategy of learning which involves diagnosis and remediation as its integral parts, can be suited most to raise student’s level of learning. We have provided educational opportunities for all students but have failed yet to adequately secure the education of each. In order to attack these problems, majority of educators feel that learning and teaching strategies, which have dual advantages of group and individualized learning, should be employed.

Mastery learning strategies provide an efficient and effective means for teachers to transform their original group instruction into instruction of optimal quality per learner. By using mastery approaches administrators can greatly shift their school’s entire achievement distribution upwards. Also, curriculum makers and researchers will find mastery learning rich in opportunities for future development and research efforts. This strategy can provide almost all students with the successful and rewarding learning
experiences and enable them to master what they are taught in the classroom (Bloom, 1971). Studies made in this area Block (1970), Yildiran (1977), Clark (1983) and Anderson (1992) suggest that mastery learning strategy results in cognitive achievement to a greater extent and also development of personality variables such as self concept, attitude (Vaidya, 1990 and Budhev, 1991) achievement motivation (Koul, 1986) etc.

Mastery Learning Strategy (MLS) can be implemented in Indian conditions without much extra efforts and expenditure (Chand, 1984). This strategy requires no elaborated and expensive technology, except the technology of developing instructional material. In this approach the prescribed curriculum can be transacted with fixed period of time and by giving a little extra time for correctives and homework. This approach relies primarily on human beings for their success, rather than on any mechanical technological device, which a developing country like India can hardly afford. Here the teacher is free to use his own instructional techniques and materials, which suit the needs of the students. The mastery learning strategy can be implemented with minor structural changes throughout the school system (Vaidya, 1991).

Guskey (1980, 1986) through the synthesis of researches on mastery learning has concluded that mastery approach has
allowed many teachers to dramatically increase the number of students in their classrooms who learn and learn very well what they as teachers have set out to teach. Therefore, if systematically practiced, mastery learning strategy could be of immense help to the teachers and administrators in arresting the rising rate of dropouts by raising achievement, self concept and attitude towards schooling of the learners (Anderson and Block, 1985).

The investigator felt that mastery learning strategy would be of great help in awakening the curiosity, the love of learning and the capacity to think and judge for one self. This approach may also lead to replacement of monotonous classroom teaching with interesting and active teaching-learning process. But while reviewing the studies conducted in India, it is found that this area of mastery learning is almost neglected. So the researcher decided to study how far this approach would be applicable in the real classroom situation.

4.0 The Statement of the Problem

Recent researches conducted in advanced countries show that mastery learning is one of the most effective strategies for teaching various school subjects. The literature indicates positive effects of mastery learning on students, especially in the areas of
achievement, attitude towards learning and the retention of content. School systems that have implemented mastery learning have found it to be a very effective teaching and learning method. Efforts to undertake studies in this line were attempted recently in India also. However, study of abstracts in the 'Survey of Research in Education' edited by Buch (1974, '79, '86, '91) reveals that very few studies have been conducted on mastery learning strategy in India. Studies on relative effectiveness of mastery learning strategy and conventional method on cognitive and personality variables may provide guidance to teachers to improve their teaching competence. Keeping this in mind the following problem was chosen for the present study.

"Effect of Mastery Learning Strategy on Certain Cognitive and Personality Variables of Secondary School Students in Kerala"

5.0 Definition of Key Terms

Effect:

Effect has the meaning of a change, reaction or result that is caused by something. It is a condition resulting, when the influence of one factor or condition is dependent on the presence or absence of another factor or condition.
**Mastery Learning Strategy:**

This is an instructional strategy that is designed to attain mastery of a learning task through variation of time and learning resources (Bloom, 1971).

**Mastery Learning:**

Each pupil attains mastery when he is able to give at least 80% correct response on a formative/summative test that has been constructed on the basis of instructional objectives with respect to that unit which each pupil is expected to achieve.

**Cognitive Variable:**

The term designates mental traits or characteristics that relate to knowledge acquired by reasoning and perception such as academic achievement and retention.

**Personality Variables:**

A representative set of affective variables, accepted as belonging to the domain of personality in modern psychological dimensions. Four personality variables such as science interest, scientific attitude, achievement motivation and self concept have been used in the study.
Secondary School level:

Any one of the standards VIII, IX or X in a school which is recognized by the government of Kerala state for providing instruction and following the state curriculum now in force.

6.0 Objectives of the Study

(i) To prepare learning materials based on mastery learning strategy in physics for standard IX.

(ii) To compare the effect of Mastery Learning Strategy (MLS) with Conventional Textbook Approach (CTA) on achievement in physics of IX standard pupils.

(iii) To compare the effect of mastery learning strategy with conventional textbook approach on the retention power of IX standard pupils.

(iv) To compare the effect of mastery learning strategy with conventional textbook approach on the science interest of IX standard pupils.

(v) To compare the effect of mastery learning strategy with conventional textbook approach on the scientific attitude of IX standard pupils.
To compare the effect of mastery learning strategy with conventional textbook approach on the achievement motivation of IX standard pupils.

To compare the effect of mastery learning strategy with conventional textbook approach on the self concept of IX standard pupils.

7.0 Hypotheses

Keeping in view the objectives of the study following hypotheses were formulated.

(i) The achievement of pupils in physics taught by mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.

(ii) The retention power of pupils taught by mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.

(iii) The science interest of pupils taught by mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.
(iv) The scientific attitude of pupils taught by mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.

(v) The achievement motivation of pupils taught by mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.

(vi) The self concept of pupils taught by the mastery learning strategy will be significantly higher than that of pupils taught by the conventional textbook approach.

8.0 Scope and Limitations of the Study

The major scope of the study is to evolve a new instructional strategy to teach physics. 'Mastery Learning Strategy' is considered as the new strategy. This strategy has been adopted in many countries to teach different subjects, but it is not widely used in our schools where rate of failure is very high. Investigator assumed that the conventional textbook approach in teaching is passive and uninteresting to the pupils, resulting in low achievement. So the investigator decided to design an alternative.

The present study has been designed with the objective to compare the effectiveness of Mastery Learning Strategy (MLS) in
the teaching of physics at the secondary level. The methods of instruction were treated as independent variables. Achievement in physics, retention power, science interest, scientific attitude, achievement motivation and self concept of the pupils were treated as dependent variables. Two major chapters of standard IX physics curriculum, Heat and Sound were divided into five sequentially arranged learning units. Many alternate learning routes were adopted after formative testing in each learning unit for corrective and enrichment purpose. The investigator herself taught both the control and the experimental groups. The sample consisted of 156 pupils of four divisions of standard IX from two schools of Ernakulam district. It is presumed on the basis of theories of psychology, that standard IX as a true representative of secondary classes for this study. The statistical techniques adopted for the analysis of data were sufficiently comprehensive to obtain the results. In the light of the conclusions arrived at, relevant suggestions are put forward. It is hoped that they may serve as guidelines for teachers and students to make teaching and learning a more easy and enjoyable task.

Despite making every attempt to make the study precise and objective as possible, certain minor limitations have crept into the study. Considering the constraints on resources it had to be limited to the following:
(i) The study was confined to the effect of mastery learning strategy on achievement, retention power, science interest, scientific attitude, achievement motivation and self concept of pupils of IX standard in two schools of Ernakulam district.

(ii) Mastery of the cognitive objectives such as knowledge, comprehension and application only were considered.

(iii) Out of the two approaches of mastery learning strategy the group based, teacher paced type was only followed.

(iv) Only some topics of a single subject such as physics is considered.

(v) An irresistible limitation of the study was the shortage of experimental duration. The investigator had to engage regular class periods in the four divisions to teach the selected topics adopting MLS and CTA.

Yet, with time and facilities available, possible precautions have been taken to evolve a study, which is to a greater extent generalisable.

9.0 Organisation of the Report

The study was culminated in the presentation of a consolidated report, which is organized into six chapters.
Chapter 1 is an introduction to the study and it centers on the aspects of background of the study, need and significance of the study, the objectives, hypotheses and finally the scope and limitations of the study.

Chapter II offers a detailed description of the theoretical background of the mastery learning strategy.

A review of the related studies that led to the emergence of the present study and that provided the investigator an opportunity to justify her endeavor is presented in chapter III.

Chapter IV, titled 'Methodology of the Study' presents a description of the design of the study stating the variables, objectives, hypotheses and the procedure followed.

A detailed analysis of data with the interpretation of results is represented in chapter V.

In the concluding chapter along with a brief summary of the study, the findings are briefly summarized and suggestions as to how best these findings may be utilized for effective classroom practices are offered. It also offers suggestions for further research.