CHAPTER - I

INTRODUCTION

1.0. The present study

The present work is an attempt of experimental nature to establish a logical correlation between the observed factors in teaching effectiveness obtained through a qualitative programmed instructional material and the corresponding factors in the level of achievement obtained through traditional class teaching method. The sample syllabus undertaken for this study of developing and testing the effectiveness of the programmed learning material (PLM) is the 'Principles of Education' in B.T. course of Guwahati University.

The design of the study deals with the practical problems such as selection of subjects (samples) for control group and experimental group, selection of methods of controlling the variables and of observations, selection of statistical technique to be employed in interpreting variable relationship and so on.

The overall background of this project containing the rationale and scope of the study, objectives, the theme and hypothesis used are discussed in the succeeding sections of this chapter - I.

1.1. Importance of programmed instruction as an instructional strategy

Lumsdaine (1964) defined programmed learning as a vehicle which generates an essentially reproducible sequence of instructional events and accepts responsibility for efficiently accomplishing a specified change from a given range of initial competence of behavioural tendencies to a specified terminal range of competence or behavioural tendencies.
The programmed learning movement has a potentially powerful contribution to teaching learning processes. Empirical studies are being conducted in different sectors of education and training to evolve better strategies of teaching-learning. The technique of programmed instruction has been successfully used in solving various problems of education in the advanced countries of the world, particularly in the USA, the UK, Germany and Russia.

Programmed learning is a way of anticipating student's responses and of designing the learning experiences to a pre-determined set of specific objectives. To the extent we can define specific instructional objectives we can successfully maximise the performance of the learner. Advantageous factors in programmed instruction such as its use of reinforcement theories under control psychological environment, identification of learning objectives and adopting principles of active learning have made programmed learning applicable to numerous instructional strategies. Some universities in the country have made a beginning in the direction of developing programmed instructional materials, but the result of their researches have not yet reached the classroom teachers for practical class-room teaching on a mass scale. The theory and practice of programmed learning have much more influence in the function of class-room teacher both in conceptual and behavioural levels. The theory of programmed learning is concerned with the understanding of the classification of the objectives of learning and its outcomes, the practice is concerned with the classroom function of the teacher.
1.1.1 Importance of Programmed Instruction in Teacher's education

In the context of orientation of teachers through an effective program, M.B. Bueh (1972) opined that programmed learning will enter the educational institutions on a systematic basis only when the colleges of education have incorporated this technique in their training programmes and their training techniques. Orientation through such a programme would certainly help the trainees in the use of programmed learning material in their institutions.

An analysis of teacher education programme points out certain key elements regarding the aim of teacher education. These are -
1. Writing behavioural objectives for units of instruction
2. Arranging information of a unit of instruction in a sequence
3. Developing competence to use a wide variety of question types
4. Evaluating the outcomes of instruction in terms of behavioural changes.

These can be effectively done while the teachers of the training college demonstrates the use of programmed materials in the classroom with trainees observing the process. Generally, the examination reforms programme include (a) writing instructional objectives in behavioural terms, (b) preparing test items, (c) preparing unit tests, (d) improving the quality of question papers etc.

The demand for education cannot be met merely by training teachers unless education concerns about efficiency in learning. According to Schramm (1962) immediate knowledge of results and
consequent reinforcement and a logically ordered sequence of items in content along with a record of constructed response to each item can be attributed only to an efficient programme for training personnel in various systems. If educational technology in general and programmed learning in particular have been found effective in different types of training programmes, the programme of teacher training should necessarily be benefited through the application of this new development.

1.2. Rationale of the study:

Research in programmed learning and system analysis approach to the problem of education promised revolutionary changes in all aspects of education and particularly in teacher education programmes. Educational technology as a means of improving effectiveness of teacher education is an area which requires immediate research. In third survey of research in education it is reported that (p. 783) - there is no single study available on the evaluation of alternative models of teacher education as a whole in terms of their effectiveness reflected in teacher effectiveness in the institutions where they secure teaching positions after the completion of their training. Before 1960, no attempts were made for, imaginative planning and speedy reorganisation for teacher education. Even now the fact remains the same, that the teacher education suffers from "the malady of vacillating efforts at change which are further flattering and slow" (Bush, 1972). Therefore there lies a high demand to investigate the teacher's role in the context of programmed instruction, if they are found to react effectively.
Programmatic research within a viable conceptual frame accompanied by functional design and analysis of research will go a long way in improving research on teacher education in the time to come.

As from the review of related literature it appears that teaching efficiency and teaching effectiveness of teaching success appears to be governed mainly by the tools used by the investigators and that programmed learning method is more effective than the traditional method. From the study of related literature it is also observed that the teachers were significantly better predisposed to adopt innovations except those who were professionally not satisfied. Gupta, B.C. (1982) established that this method is far better and interesting to make all types of teachers adaptable of educational innovations. When we discuss about effectiveness of different innovative methods in the direction of better learning both for lower level and higher level education programmed learning material is found to be more effective than discussion, symposium supervised study and lecture method at both 1 percent and 5 percent level of significance. So in all contents we should make use of programmed learning material which is a self-instructional material particularly for teaching theories. Kamoski of the Centre of Programmed Instruction says, "The creation of programmes is a remarkably effective teacher-training tool. This constitutes a rigorous training ground in sound pedagogy." He concluded that teachers' colleges might well investigate the possibilities of programming as an effective means of teacher training. The review of above certainly establishes the necessity/measuring the feasibility of introducing programmed learning material as a teaching media in the teacher training institutes.
The relation of training strategy with the social and economic situation in Assam in particular bears many limitations, such as —

(i) The dearth of efficient trained teachers in the colleges of education hampers the teacher training programmes.

(ii) The socio-economic conditions of our state prevent the educational authorities from using sophisticated hardware or software technologies as instructional media.

(iii) Internal conditions and various other factors prevent the majority of our teachers from attending regular training facilities. Efficient self-instructional materials can only help any renovation of these teachers.

(iv) Professionally-reluctant teachers usually do not like to adopt innovation through regular training courses. An effective programmed material is surely a boon for them as well as for their taughts.

(v) The changing concept of curriculum along with the exponential growth of education cannot be materialised through any other hardware technology for instructional media than an effective programmed learning material which can be changed frequently with less labour and less financial implication.

Considering all these justifications a technical attempt to establish the effectiveness of instructions to teachers by methods of programmed instruction over the traditional one is certainly need-based and an essential requirement of our present educational research.
1.3. Characteristics and styles of programming

The system of programmed learning is based upon the principle of operant conditioning. It was developed by B.F. Skinner (1954), under a series of controlled laboratory experiments to formulate the grounds for human behaviour. The objective of operant conditioning procedure is to increase the frequency of the response. In operant conditioning the "response is instrumental in bringing about the reinforcement." Any stimulus whose presentation or removal increases the probability of a response is a reinforcer. This theory is also known as instrumental conditioning where the emphasis is response modification or change. It concerns with the R-S (response - stimulus) association.

Based on the fundamental principle of psychology for the programmed learning we get the following distinct characteristics of a programmed learning material.

They are as follows —

(i) A detailed statement of the specified objectives.
(ii) The subject-matter is broken down into small steps called frames and arranged in a well-ordered sequence.
(iii) The frames will vary according to the level, subject matter and stage of learning.
(iv) Frequent and unambiguous responses from every student are required throughout the whole sequence. Learning will occur only if the learner makes some relevant responses to the learning task.
v) Students are given the feedback of information about the correctness of responses before presenting the next frame or item.

vi) By getting a copy of the programmed Learning material each student can progress at his own pace without any threat. Handicaps for slow learning pupil and also for fast learning pupil are easily overcome.

According to Arthur Lumadame the programme tries to see to it that the student does learn and it takes the blame for the student's failure. A programme is actual instruction itself and the student's success or failure depends on the programme.

Mainly there are three different styles of programming. Namely these are as follows

1) Linear or extrinsic style
2) Branching or intrinsic style
3) Mathetics.

Besides the above three styles there is another style known as Mix or Hybrid programme.

**Linear style** : The linear style of programming was developed by Prof. B.F.Skinner(1954) of Harvard University. This style is based on sound psychological principle. According to this principle the best way of teaching a student is to break the subject-matter into small fragments of meaningful information in a way that only the correct answers are most likely to occur.
**Branching Style:** The branching or intrinsic style of programming was developed by Norman A. Crowder (1960). It is called intrinsic because in this style of programming it is the learner himself who makes the decision to adopt instruction to his needs and according to his previous knowledge of the subject. The branching style is based on the principle that different students need different instructional materials and that students can learn from their own errors. It is also known as crowderian style.

**Mathetios:** Mathetios comes from the Greek root Mathein which means "to learn". Thomas F. Gilbert is the originator of the concept of mathetios and he described the systematic procedures of mathetios in 1962. In mathetios style, an "exercise" is the technical unit of learning instead of a frame as in the linear type. Gilbert defined it as "the systematic application of reinforcement theory to the analysis and reconstruction of those complex behaviour repertoires usually known as "subject matter mastery", "knowledge" and "skill". Mathetios is first of all a procedure for analysis of the behaviour to be taught. Secondly, it is a technique of programme construction that gives the programmer

1) a guide for determining what to teach

2) a basis for making teaching strategy decision and

3) a detail procedure for constructing a programme.

**Mixed or Hybrid programme style:**

In this style of programming the programmer gets more freedom to use both the linear and branching style in mixed whenever he/she feels it necessary. The utility and procedure of Hybrid style of programming is described fully by V.Krishnamurthy (1972)
1.3.1 METHODS OF PROGRAMMING

In the present project the programmer follows the linear style of programming because of the fact that all the fundamental principles of operant conditioning have been incorporated in this style of programming. Some other advantageous factors incorporated in this style are active participation, self-pacing and self-constructed response with immediate feedback on the part of the learner. In this style of programming a small-step size unit can be measured with less percentage (5%) of error rate.

14 STATEMENT OF THE PROBLEM

The problem of investigation is stated as follows -

"Developing and Testing the effectiveness of the Programmed Learning Material in the syllabus of Principles of Education in B.T. course of Gauhati University".

1.5 OBJECTIVE OF THE PRESENT STUDY:

The primary objective of the present study is to test the effectiveness of the Programmed learning materials upon the achievement in the education of B.T. students over the traditional method. To meet this objective the programmer had to develop and validate the programmed learning material keeping in mind the following objectives -

(i) to clarify and mobilize the idea of the new concept of principles of education.

(ii) to realise, appreciate and interpret the course content by the learner so that it can stimulate, organise and liberate their thoughts.
iii) to develop skill, intellectual power and ability of the learner to transfer knowledge.

iv) to justify the new method of programmed learning for an individualised instruction.

v) to make use of the material as a reference for methodical teaching learning process.

1.6. TESTS OF SIGNIFICANCE:

The Hypotheses of the present study:

For the present study the following hypotheses were formulated.

i) there is no significant difference in the achievement in 'Principles of Education' paper between the group taught through the programmed learning material and the group taught through the traditional method.

ii) There is no significant difference in the lower level achievement in principle of education paper between the group taught through programmed learning method and the group taught through traditional method.

iii) There is no significant difference in the higher level achievement in principles of education between the group taught through PLM and the group taught through traditional method.

iv) There is no significant difference in the achievement in subtest I, sub-test II and sub-test III on principles of education between the group taught through the PLM and group taught through the traditional method.
After realising the need for an investigation the future results are assumed on the basis of the work being done so far in the field. The above are the basic assumption underlying the present study which are arrived at from the past researchers, related literature and general knowledge about the learners.

1.7. TERMINOLOGY

For the present study the following terminology are used which are defined as follows:

i) **PIM**: This is the abbreviation used for Programmed learning material. It has already been mentioned that the styled of the programmed learning material used here is the Linear style. It also includes selection type responses also.

ii) **Traditional teaching method**: The traditional teaching method is used in this study to mean the usual classroom teaching method conducted in teaching-learning process.

iii) **reinforcement**: In this present study the term reinforcement is used to imply the reward given to the students at the moment he responses the correct answers. This reinforcement may be in the form of 'Thanks', 'very good', 'good' etc.

iv) **Achievement of pupils on PIM**: This is judged in terms of the scores obtained on the criterion test of the programme - giving immediately after completing the programme and after an interval of a few weeks after completing the programme.
v) Operant conditioning: Operant conditioning is a more complicated type of learning. The necessary entering behavior is the availability to the organism of particular responses. When a pigeon pecks a disc, or a dog scratches its head, it has changed the state of environment by its responses. These responses are called operant because they operant on the environment.

vi) C.T. - This is the abbreviation used for 'Criterion test'.

vii) APR: is the abbreviation used for 'Achievement test in principles of Education'.

viii) Observed score is the score that a student actually obtains.

viiii) true score is the score one would make if there were no errors in measurement.

1.8. CHAPTERISATION

The report of the project will be presented according to the following sequence:

Chapter I: Introduction
   II: A survey of Related literature
   III: Method and Procedure
   IV: Construction of the criterion test
   V: Development of the Programme
   VI: Collection of data and analysis.
   VII: Results and Discussion
   VIII: Summary and conclusion.