8.0. Summary:

Programmed instruction plays a pivotal role in educational technology as a standardised interactive instructional system in a teaching-learning strategy.

Although there are some findings about the effectiveness of PIM over traditional and other methods these are all restricted to a limited number of fields, and none deals with the teacher-training curriculum to count PIM as an instructional strategy. Hence the idea of effectiveness cannot be generalised unless it covers the basic cornerstones of educational instruction. It therefore evolves the necessity to attempt some study to contribute to this line and with this in mind the present programmer has undertaken to develop and test a PIM on a teacher-training syllabus. The problem for present study is

' Developing and testing the effectiveness of programme learning material over the traditional method in B.T. syllabus of Gauhati University.

8.1. Objective of the Present Study

The present project consists of three primary objectives

a) To construct and standardize a criterion test in the Principles of education for B.T. students.

b) To construct, develop and validate a programmed material in the 'Principles of education' for the B.T. students.
8.2. TOOL CONSTRUCTION

For the present investigation the investigator has prepared three tools. They are -

1) The achievement test in Principles of education,
2) the programmed learning material, and
3) the three subtests—subtest I, subtest II and the subtest III.

For validating the effect of the programmed material the criterion test was constructed by the investigator herself and also she had developed and validated the test.

Secondly, the investigator had developed and validate the programmed material itself.

The third tool was the subtests which were constructed by the programmer to test the effectiveness of the programmed learning material over the traditional method of class teaching.

8.3. THE STUDY HYPOTHESES

In the present study there were four hypotheses to be tested by the programmer. The hypotheses were related to the general achievement in Principles of Education, the lower level achievement in Principles of Education, the higher level achievement in Principles of Education and the achievement in subtest I, II and III respectively. The hypotheses were as follows:

1. There is no significant difference in the achievement in Principles of Education between the group taught through the PLM and the group taught through the traditional method.

2. There is no significant difference in the lower level achievement in Principles of Education, between the groups taught through the PLM and group taught through traditional method.

3. 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.

4. There is no significant difference in the achievements in subtest I, subtest II, and subtest III of Principles of Education of B.T. students between the groups taught through PLM and the groups taught through traditional method.

8.4. **PROCEDURE**

The present investigation proceeds mainly through three phases. They are -

A) Constructing a criterion test on principles of education

B) developing a programme on principles of Education.

and

C) the testing phase which consists of

i) achievement test in Principles of education

ii) lower level achievement in Principles of education

iii) higher level achievement in Principles of education

iv) achievement in subtest I, II and III.

The objectives of the above phases respectively are-

i) to find out the validity of the programme against

the external criterion of the mastery level of 90/90.
ii) to construct linear style frames in the principles of education for B.T. course

iii) to test the effectiveness of the PIM over the traditional method of class teaching.

To test the validity of the programmed material, the programmer had constructed and validated a criterion test named as the 'Achievement test in Principles of education'. As there was no criterion test readily available for the present study the programmer herself had to do this work as a tool for measuring the validity of the PIM.

Item analysis and establishing of reliability and validity of the criterion test form part of the standardization of the criterion test. Fifty B.T. students of Mangaldoi B.T. College were randomly selected as sample for item analysis of the criterion test. For testing the reliability and validity of the criterion test, 40 B.T. students were randomly selected as sample from Nagaon Teacher Training college, Nagaon.

Mainly three types of try-out were necessary for the development of the programme. These three were (i) individual try-out, (ii) group try-out, and (iii) the field try-out respectively.

To test the effectiveness, the investigator had to construct three subtests, subtest I, II and III. The investigator had administered the subtest I to both the control and the experimental group after finishing the teaching of unit I of the Principles of education and similarly the subtest II after finishing the second and the third units and the subtests III
after finishing the fourth and the fifth units. The sample of 60 students were selected for this testing from Banikanta B.T. College of Guwahati. With the help of entry behaviour test these 60 samples were divided into two equal groups i.e. experimental and control groups. The significance of differences between the means of their achievement on the criterion tests, subtests on the "Principles of education" were tested at different levels.

8.5. FINDINGS OF THE STUDY

The findings of the present experiment may be described as follows:

1. The PLM is found to be effective compared to the traditional method of class teaching in their achievements in 'Principles of Education' in sub test-I. The difference between the two mean scores of the groups (experimental group and control group) are significant at 0.01 level which established the superiority of PLM over the traditional method.

2. The treatment of PLM in Principles of Education of B.T. students produces significant positive effect upon the achievement in subtest II when compared with the traditional method.

3. The effect of treatment of the PLM was found to be effective when compared with the traditional method in their achievement in post-test in 'Principles of Education'. The difference between the two mean scores in the post tests was found to be significant of 0.01
level which shows the superiority of the PLM over the traditional method.

5. There is significant difference when compared to pre-test, post-test scores of the experimental group with those of the control group. This difference is due to the treatment with the PLM to the experimental group.

6. PLM is found to be effective at the lower level achievement (Bloom's) when compared with the traditional method.

7. PLM produces significant effect at higher level achievement (Bloom’s) when compared with the class teaching method.

8. The PLM is particularly suitable for lower level intelligence students as compared to the traditional method.

9. The PLM is found to be suitable for higher level intelligence students when compared with the class teaching method.

10. The attitude of the learner towards PLM was positive. The students express their opinion that through PLM they can learn better as compared with the traditional method.

11. The opinion of the learner about the PLM is favourable. They opine that PLM is useful for any educational institution and for revision of the course.

8.6. CONCLUSION

The investigator of the present attempt finds the PLM effective over the traditional method. From the survey of related literature also it is found that there is a significant difference between the achievement through PLM and the achievement through traditional method of class teaching.
The PLM is superior to the traditional method of teaching in so far as the learning effect is measured either in terms of the students' lower level achievement or in terms of their higher level achievement.

The PLM is an effective means of instruction for students such as students with below average, average and above average level of intelligence.

Students of every category can proceed at their own pace. All types of students can be equally benefited by this way of learning.

The learner showed positive attitude towards the PLM. The present result is similar to the results reported by Joshi (1966), Mullick (1967), Desai (1966) and other researchers.

Students showed favourable attitude towards PLM than the lecture method. The cause of this popularity is due to the fact that the PLM provides the advantage of individualized instruction which is not available in the traditional class teaching method.
Again there are some advantageous factors in PLM such as, principle of small steps, principle of immediate reinforcement, self-paced which stimulate learner to appreciate this type of instruction more than the traditional method.

In the present investigation also the investigator finds that 90% of students taught through the PLM scored 90% marks; therefore the conclusion is that the programmed instruction is comparatively more effective than the traditional method of teaching.
8.7. IMPLICATION

The present study after establishing the effectiveness of a PIM over a B.T. syllabus implies that PLMs are effective in producing high academic achievements for a teacher. Some of the academic implications suggested by the present investigation are:

1) Programmed instruction produces a standardised sequence of instructional events to produce a measurable effect on a teacher's students.

2) Although a self-instructional model does not substitute a good teacher, it can be used as a master guidance saving their time, labour and other relevant problems.

3) PIM may be an only effective model to be used in any teacher's orientation programme.

4) Programmed Instruction may be used for the stagnant teachers incapable of attending regular lectures or for the dropouts irrespective of their level of intelligence.

5) Programmed instruction can keep the practising teachers abreast with new developments in content of course and technology of teaching. Correspondence course in this line through PIM will do immense help to the teachers.

6) Programmed materials prepared by experts for students and teachers can be of good use to make up the deficiency of good teachers felt in science and mathematics particularly at the secondary level.
8.8. SUGGESTION FOR FURTHER RESEARCH

In the course of involvement in different dimensions of the works done here and in the related fields, the present investigator has come across a number of points that suggests the scope of further research and extension of the present work. These are placed in brief in the following -

1. The investigator of the present study confined her area in a limited course content in 'Principles of Education'. But there are ample scope to make attempt in diverse areas in teacher training curriculum programmes.

2. The sample of the present investigation confined only to a limited number of samples. The same study can be replicated with large samples also with varied grade level.

3. Another important area for investigation is that the attitude of the teachers towards programmed instruction and measures of its feedback.

4. Further investigator can study the relative effectiveness of the programmed instructional material developed with the present curriculum and with an innovative curriculum.

5. Further advanced type of instructional strategy may be probed for our training system which can be better used in prevailing socio-economic conditions.