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1.1 Context of the Study

Application of principles of physical sciences has provided various equipments such as radio, television, films, slides, etc. These can be used in instructional process to make it more effective. Similarly, behavioural sciences have certain principles about human behaviour, application of which has provided various instructional techniques such as programmed learning, lecture, discussion, seminar, team teaching and the like. In instructional process both equipments based on principles of physical sciences, and instructional techniques evolved from principles of behavioural sciences are used. Utilisation of these in the instructional process for the effective and efficient realisation of pre-determined objectives is what may be called instructional technology.

Researches in instructional technology would be mainly concerned with understanding, controlling and predicting certain events in the instructional process. When instructional process is looked into, it becomes evident that it involves, the use of several equipments and techniques, and for understanding and controlling instructional process, it

is not enough to study their use in isolation; they have to be considered in a total situation where each of them appears as a component of a total system aimed at the realisation of instructional objectives.

There are several components that may be used in instructional process for the realisation of objectives. Programmed learning is one of these components used in the instructional process which can contribute to the realisation of certain objectives set for the total system. Each component used in the instructional process may be studied separately for its adequacy and effectiveness. Technique of programmed learning may also be studied for its effectiveness as a component of the instructional system. The objectives that may be achieved through programmed learning are mainly (a) to give some basic information, and (b) to develop independent study habits. One may think of other techniques also such as lecture, discussion, assignments, etc. for realising these objectives. In such situations where two or more techniques can be employed, the question of their relative effectiveness would come in. The effectiveness of the techniques viz. programmed learning and lecture have been studied by different researchers both in India and abroad. The brief survey of researches in India and abroad (Dewal, 1969) have shown that students learning through programmed material show significant improvement in perfor-

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mance as compared to students taught through conventional methods. There is also a significant saving of time. In programmed learning students learn at their own speed; their attention is focussed on a small amount of material at a time; they respond to each sagment of the material, and get immediate knowledge of the result. On the other hand, in conventional teaching all students are forced to move at one uniform speed; a big chunk of learning material is presented which often becomes incomprehensible to the students, and they remain uninvolved for most of the time and sit as passive listeners only. Therefore, it is justified to consider programmed learning as an effective and efficient component of instructional system.

Programmed learning has its root in the 'behaviour orientation' of Thorndike, Lorge and others (Ely, 1970). Thorndike (1912) in his 'Education' has prophesied "If by a miracle of ingenuity a book could be so arranged that only to him, who had done what was directed on page one, would page two become visible, and so on, much that now requires personal instruction could be managed by print....." The contemporary programmed material in book is exactly this, but the movement got off the ground only after the publication of Skinner's (1954) classic article, "The Science of Learning and the Art of Teaching".

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Programmed learning has been perceived and defined by different people in many ways. Markle (Lange, 1967) defines it as a method of designing reproducible sequences of instructional events to produce a measurable and consistent effect on the behaviour of each and every acceptable student. According to Leith (1970) programmed instruction is steered by explicit sets of objectives and in typical examples requires active student participation and provides feedback to students about their on-going performance and their degree of mastery of the subject section of a programme. From these definitions it can be concluded that the instructional material is prearranged in a logical sequence by following which students can learn at their own.

Skinner who has long been concerned with the shaping and conditioning of behaviour is the proponent of linear programming. In linear programming the material is arranged in a single ordered sequence and every student must proceed from the first to the last item. Linear programmes can be of different types, viz., linear overt form, linear covert form, response prompt overt form, and response prompt covert form.

Linear overt form is the one with small steps requiring either construct responses or selection of one, of the two or more alternatives. After writing the response, the student has to compare it with the correct answer given

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in the programme. On the other hand in linear covert form the student just makes response internally (thinking) and then compares it with the correct response. The difference between linear overt form and linear covert form is in terms of response mode.

Response prompt overt form is the linear form in which the response blanks are 'already filled', the student has to copy down the response word. Response prompt covert form is also the linear form in which the response blanks are already filled; the response is internalized which the student presumably makes (reading) but it is not recorded. The difference between linear (overt and covert) and response prompt (overt and covert) forms is that in the former the student has to compare his responses with those given in the programme whereas in the latter there is no need for comparison.

Crowder proposed another method of programming known as branching. There are more than one sequence through which the matter is presented. The sequence followed by a student is determined by his response. For example a correct response to one question may lead to a route that skips several questions while an incorrect reply directs him to a route on which each of the questions must be answered. Since the student's response determines the route to be followed, this type of programming is also called intrinsic.

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The difference between the linear form and the branching form is in terms of the route followed.

Branching can be of two types. They are backward branching and forward branching. Backward branching is based on the principle of 'repeating the missed frames'. The student from frame number one of the main stream goes to frame number two of the main stream only if he makes a correct choice. But if he makes a wrong choice he is led to a remedial frame wherein he is given some more help in understanding the concept. He is then directed to the original frame number one so that he reads it again and answer it correctly in the light of remedial material he has received. In the forward branching, whether the student makes a wrong choice or correct choice he always proceeds to new pages, thus physically progressing from page to page. The student who makes a correct choice goes directly to the next frame of the main stream. But if the pupil makes a wrong choice, he goes to a remedial frame wherein his mistake is fully explained, probably followed by another parallel or identical question.

Skip programme form is another type which contains small steps; the sequence starts with a terminal frame and the student who makes a correct response would skip certain frames dealing with further elaboration of the sub-concept.

8 If the student makes an error, he goes through further elaboration of the sub-concept.

1.2 Significance of the Present Study

The use of programmed learning material has become a part of the instructional programmes at all stages of education in several parts of the world. Many of the instructional systems and strategies in current use such as Individually Prescribed Instruction, Personalised System of Instruction (Keller Plan), Instructional Modules, Multimedia Packages of Instruction, Feedback Classrooms and Computer Assisted Instruction invariably include programmed instruction as a major component in them. It is also obvious that most of the instructional systems and strategies, in their development and utilisation adopt such procedures as specification of instructional objectives in behavioural terms, analysis of tasks involved, field testing and revision, arrangement for inbuilt feedback to learners, and criterion referenced testing all of which have been originally prescribed as essential features of the developmental process of any programmed learning material and its basic structure.

In a country like India, where the masses are becoming rapidly conscious of imparting education to the teeming millions, the problem of supplying qualified teachers assumes new dimensions. Not only that the teachers are to be trained

9 initially, but they are also to be refreshed periodically, to keep them acquainted with new developments in different aspects of education. In this situation, programmed learning seems to hold a promise to meet the new challenges of the day.

Of late programmed material is being used as a mode of instruction in the class rooms of at least a few institutions in India. The researches conducted by Govinda (1975) and Sansanwal (1976) involved the use of programmed material in B.Ed. and M.Ed. classes respectively. Seshadri (1976) is currently using the programmed learning material (PLM) in the high school classes for teaching Mathematics. In many other institutions in India, the programmed learning materials are being used for conducting researches to establish their effective utilisation for instructional purpose. Detailed reviews of these studies have been reported in Chapter II. These researches show that PLM has been initiated in Indian classrooms.

A stage has thus been reached in this country when more studies are needed to establish the effective and efficient ways of presenting the instructional material through various techniques including the programmed instruction. Of the several forms of programming, which one is to be used should be decided experimentally. With this in view the investigator has taken up the present investi-

gation to study the relative effectiveness of (a) linear overt, (b) branching, (c) skip, and (d) response prompt forms of programming.

Programmed learning was heralded as the great solution to the growing problem of individual differences. The ideal learning situation is one instructor and one student. Since it is not economically feasible to have one line instructor, it is essential to take the advantage of programmed learning. The promise of programmed learning has been that each student proceeding at his own rate reaches the terminal behaviour as soon as he completes the programme.

Studies of individual differences in achievement carry special significance when the students learn through programmed learning method. Programmed learning being a self-instructional method wherein the student learns without much group influence and teacher influence, allows the researcher to study differences in achievement with greater precision and under better controlled conditions. It is also argued that all students learn equally well through programmed learning irrespective of differences in their characteristics. But every human being is the product of a gentic endowment and an environmental history which is peculiarly of his own. In other words every human being has a unique personality.

11 With this view in mind Fusco (1962) writes that, "a particular programme may not be optimally effective for all members of a typical class. So, the relationship between certain personality variables and performance of the students on the different programme forms can help to understand whether a particular form of programme is better suited for a group of students with particular set of characteristics than others. Thus, the investigation includes the study of the effectiveness of different forms in relation to certain personality variables viz., reading comprehension, academic motivation, adjustment, dependency and attitude towards programmed learning.

The present investigation has been titled as "An Experimental Study in the Use of Programmed Learning Material in the Classroom".

1.3 Objectives of the Study

(1) To study the relative effectiveness of the four forms of programme viz. linear overt, branching, skip and response prompt in terms of

(i) performance of the students on the posttest,

(ii) time taken to complete the programme.

(2) To study the difference in mean achievement of the students when adjusted for their reading comprehension.

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(3) To study the relationship between performance of the students on posttest and

(i) reading comprehension

(ii) academic motivation

(iii) dependency

(iv) total adjustment

on each form separately.

(4) To study the relationship between performance of the students on posttest and

(i) home score

(ii) school score

(iii) peers score

(iv) teachers score

(v) general score

on each form separately.

(5) To study the relationship between performance of the students on posttest and

(i) pretest

(ii) programme time

(iii) attitude

on each form separately.

(6) To study the relationship between pretest and

(i) programme time

(ii) attitude

on each form separately.

13 (7) To study the relationship between attitude and programme time on each form separately.

(8) To test the significance of the means of

(i) posttest score

(ii) programme time score

(iii) reading comprehension score

of the boys and girls in each form separately.

(9) To test the significance of the means of

(i) posttest score

(ii) programme time

(iii) reading comprehension

of the high and low academic motivation students in each form separately.

(10) To study whether there is any significant difference in the

(i) mean posttest score

(ii) mean programme time

for different levels of dependency of all the forms together.

(11) To study whether there is any significant difference in the

(i) mean posttest score

(ii) mean programme time

for different types of attitude of all the forms together.

14 (12) To study the attitude of the students towards programmed learning.

1.4 Hypotheses of the Study

It has been hypothesized as follows :

(1) There is no significant difference in the mean performance of the students on the posttest of the four forms of the programme.

(2) There is no significant difference in the mean time taken on the four forms of the programme.

(3) There is no significant difference in the mean performance of the students on the posttest of the four forms of the programme, when adjusted for their reading comprehension.

(4) There is no significant relationship between performance of the students on the posttest and
   (i) reading comprehension
   (ii) academic motivation
   (iii) dependency
   (iv) total adjustment
   on each form separately.

(5) There is no significant relationship between performance of students on posttest and
   (i) home score

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(ii) school score

(iii) peers score

(iv) teachers score

(v) general score

on each form separately.

(6) There is no significant relationship between performance of the students on posttest and

(i) pretest

(ii) programme time

(iii) attitude

on each form separately.

(7) There is no significant relationship between pretest and

(i) programme time

(ii) attitude

on each form separately.

(8) There is no significant relationship between attitude and programme time on each form separately.

(9) There is no significant difference in the means of

(i) posttest score

(ii) programme time score

(iii) reading comprehension score

of the boys and girls in each form separately.

(10) There is no significant difference in the means of

(i) posttest score

(ii) programme time score

16 (iii) reading comprehension score

of the high and low academic motivation students in each form separately.

(11) There is no significant difference in the

(i) mean posttest score

(ii) mean programme time

for the different levels of dependency of all the forms together.

(12) There is no significant difference in the

(i) mean posttest score

(ii) mean programme time

for the different types of attitude of all the forms together.

REFERENCES

Dewal, O.S. Work done in the field of programmed learning in India (Mimio). Paper presented at the zonal seminar on programmed learning, Vallabh Vidyanagar : Sardar Patel University, 1969.

Ely, Donald, P. 'Toward a philosophy of instructional technology'. Journal of educational technology. Vol.1, No.2, May 1970.

Fusco, G.C. 'Programmed self-instruction : possibilities and limitations'. In Smith, W.I. and Moore, J.W. (eds.) Programmed Learning. Toronto : D. Van Nostrand Company, Inc., 1962.

Govinda, R. 'Development of a programmed text on educational evaluation and experimentally studying its effectiveness as instructional material for B.Ed. students'. Unpublished Ph.D. thesis, Baroda : M.S. University of Baroda, 1975.

Leith, G.O.M. Quoted in Richmond, W. The concepts of educational technology. London : Weidenfeld and Nicolson, 1970.

Markle, S.M. 'Empirical testing of programs'. In Lange, Phil, C. (ed.) N.S.S.E. Yearbook. Chicago : University of Chicago Press, 1967.

Sansanwal, D.N. 'An experimental study in P.L. for teaching research methodology course at M.Ed. level'. Ph.D. thesis, Baroda : M.S. University of Baroda, 1976 (in progress).

Seshadri, M. 'Evolving instructional strategy for teaching mathematics in high school'. Ph.D. thesis, Baroda : M.S. University of Baroda, 1976. (in progress)

Skinner, B.F. 'The science of learning and the art of teaching' Hardward educational review. Vol.24, No.2, 1954.

Thorndike, E.L. Education. New York : Macmillan, 1912.
