# UNIT 11 : PROGRAMMED INSTRUCTION

## UNIT STRUCTURE


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## 11.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- Know the meaning and definitions of programmed instruction;
- Discuss the nature of programmed instruction;
- Enumerate the principles of programmed instruction;
- Explain the objectives of programmed instruction;
- Identify the stages of programmed instruction;
- Describe the types of programmed instruction;
- Analyze the merits and demerits of programmed instruction.

## 11.2 INTRODUCTION

Programmed instruction is one of the approaches that has gained great acceptance in recent years in education. It is a distinct strategy of

instruction based on the principles of learning defined by the behavioristic school of psychology as expounded by Skinner. These principles emphasize the need to specify the terminal behavior to be developed in the learner and then design the instructional process so as to maximize the rate of acquisition and maintenance of terminal behavior. This is achieved by the application of the principles of active responding, reinforcement, gradual and successive progression and empirical validation. The programmed instruction is based on the theory of operant conditioning.

The term Programmed Instruction has been coined from principles of operant learning or conditioning developed at the psychological laboratories on the basis of experimental studies conducted on animals by B. F. Skinner of Harvard University. This concept was used to development of self-learning material or programmed learning and teaching machines. B. F. Skinner and his companions had first started 'programmed learning' in 1943.

## 11.3 MEANING OF PROGRAMMED INSTRUCTION

Programmed instruction or programmed learning is one of the important innovations in the teaching learning process. It is a carefully specified, systematically planned, empirically established, skillfully arranged and effectively controlled self-instructional technique to provide individualized instruction or learning experiences to the learner. The subject matter or learning experience is logically sequenced into small segments. The learning experience is self-corrected. It is an application of the principles of behavioral sciences and technology in the field of education.

## 11.4 DEFINITIONS OF PROGRAMMED INSTRUCTION

Some definitions of programmed instruction are as follows -

- "Programmed learning is a step by step, self-instructional programme, systematic, aimed to ensure the learning of stated behavior" ------- Edgar Dale.
- "A Programmed instruction is a method of self-instruction that enlists

machines or specially prepared books to teach information" ------- Chris Jordan.

- "Programmed instruction is the process of arranging the material to be learned into a series of sequential steps that is from known to unknown" ------- Smith and Moore
- "Programmed learning is a method of designing a reproducible sequence of instructional events to produce a measurable and consistent effect on behavior of each and every acceptable students" ------- Susan Markle.
- "Programmed learning refers to the arrangement of instructional material in progressive sequences" -------- Harold W. Bernard.
- "Programmed instruction is a planned sequence of experiences, leading to proficiency, in terms of stimulus - response relationship that have proven to be effective" ------- J. E. Espich and Bill Williams.
- "An instructional programme is 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 competencies or behavioral tendencies" ------- Arthur A. Luonsdaine.

From the above definitions, it can be summed up that programmed instruction is a method of presenting new subject matter to students through a graded sequence of controlled steps with corresponding activities. Students work through the programmed material at their own speed independently and assess their own comprehension after each step through exam questions or filling in a diagram. This method consists of a network of tests and statements which direct the student accordingly depending on their pattern of errors.

Programmed instruction refers to two main methods of learning. The first was developed by Norman Crowder, where the instructor includes multiple choice test questions within the text and provides feedback for each of the non-correct alternative options when a student chooses them. The second was developed by B.F. Skinner and includes a schedule of reinforcement for activities placed in a specific, continuous order.

## 11.5 NATURE OF PROGRAMMED INSTRUCTION

The nature of programmed instruction can be explained below -

- Programmed instruction is a method of individualized instruction.
- In this technique instructional materials are logically sequenced and broken into suitable small steps of the subject matter called 'frames'.
- In actual operation the beginning is made by presenting a form. The learner is required to read or listen to then respond actively.
- Programmed instruction system has an adequate provision for feedback.
- In a programmed learning situation, the learner progresses at his own pace.
- Here, the interaction between the learner and the learning material or programme is very important.
- Programmed instruction provides self-spacing to the learners.
- Programmed instruction is based on the behavioristic principles of psychology.
- It calls for the overt responses of the learner which can be readily be observed, measured and effectively controlled.
- In programmed instruction objectives are defined clearly in operational terms.
- Frequent response is required of the student.
- In a programmed material continuous evaluation is possible by the record of student's response.
- The assumption about the learner is clearly stated in the programmed learning materials.
- The content and sequence of the frames are subjected to actual try out with students and are revised on the basis of data gathered by the programmer i.e. "diagnostic feature".
- The objectives underlying programming are defined explicitly and in operational terms so that the terminal behavior is made observable and measurable.

- The strategy provides sufficient situation for teaching the student to make discriminations among range of possibilities and to reduce generalizations.
- There is immediate confirmation of right answer or correction of wrong answers given by the learner's i. e. "self-correcting feature".
- Programmed instruction enhances the capacity of the learner to discriminate or to generalize by frequent application and thus offers the learner an interesting challenging project.
- In programmed instruction a learner moves in every specific way as opposed to traditional procedures of teaching where the learner moves in very general way.
- Programmed instruction takes care of the fact that there are even differences in the rate at which an individual learner learns various kinds of subject matter.

## 11.6 PRINCIPLES OF PROGRAMMED INSTRUCTION

Programmed instruction is a relatively new strategy in teaching learning process, which has outweighed the traditional teaching techniques that have become obsolete in the technologically developed societies. Five basic principles of programming have basically emerged from the experimental studies conducted by Prof. Skinner. They are given below -

- **Principle of small steps:** This principle is based on the basic assumptions that one learns better, if the content matter is presented to him/her in suitable small steps. According to this principle a programmer while preparing a program should try to arrange the subjects matter properly into a sequence, meaningful segments of reformation called 'Frames'. These segments should be presented one at a time before the learner for responding.
- **Principle of active responding:** This principle rests on the assumption that a learner learns better by being active. In programmed instruction the learner may remain active. A good program should actively involve the learner in the learning process.

It should be formed that the learner may not get difficulty in moving from one frame to another and to remain meaningfully busy and active by responding to the frames and then acquiring the knowledge in a properly sequenced way.

- **Principle of immediate reinforcement:** The psychological phenomenon of reinforcement is the basis of this principle. One learns better when one is motivated to learn by receiving information of the result just immediately after responding. Therefore, in a good program, appropriate consideration is always made on immediate reinforcement is always made on him/her by informing immediately about the correctness of his/her response.
- **Principle of self-pacing:** The programmed instruction is a technique of individualized instruction. It is based on basic assumption that learning can take place better if an individual is allowed to learn at his own pace. The programming of the material should be done on the view of the principle of individual differences and the learner should be able to respond and move from one frame to another according to his/her own speed of learning.
- **Principle of student evaluation:** The continuous evaluation of the student to the learning process leads to better teaching and learning. In the programmed instruction the learner has to leave the record of his responses because he is required to write the response for each frame on a response sheet. This detailed record helps in receiving the program.

## 11.7 OBJECTIVES OF PROGRAMMED INSTRUCTION

Following are the objectives of programmed instruction -

- To help the students for learning by doing.
- To provide the situation to learn at his/her own speed.
- To help the student to learn without the presence of teacher.
- To present the mater in a logical manner.
- To study himself.

- To evaluate himself.
- To compare his/her answer with the key.

## 11.8 STAGES OF PROGRAMMED INSTRUCTION

The stages of programmed instruction are -

- **Preparation:** This is the first stage in the development of program. It includes selection of the topic, writing assumptions about learners, defining objectives in behavioral terms, writing the entry behavior of the learner, developing specific outline of the content, preparing a criteria test.
- **Construction or writing of the programme:** (a) It includes writing drafts, frames in a sequence i.e. from simple to complex, (b) editing the drafts frames by a team of experts usually comprising a subject matter expert, a skilled writer to a programmer.
- **Try out revision:** (a) It includes a trying out the programme on a few individual learners and finding out their reactions and making necessary changes in the light of reactions, (b) trying out the problem on a group of learners and making necessary changes on the basis of their reactions, (c) trying out the problem in the field.
- **Evaluation:** This implies findings the success or the failure after implementing a problem.

## 11.9 TYPES OF PROGRAMMED INSTRUCTION

Following are the types/styles of programming -

- Linear Programming.
- Branching Programming.
- Mathetics.
- Computer Assisted Instruction

**They are explained below -**

- **Linear or Extrinsic Programming:** B.F. Skinner is the originator of linear programming. It is also called a single track program or extrinsic programming. According to Skinner, a creature, a bird, or

a human being can be lead to a desired behavior by means of a carefully constructed program consisting of small steps leading logically through the subject matter from topic to topic, provide each step is reinforced by some kind of favorable experience and rewards. In the linear program the learner's responses are controlled externally by the programmer sitting at a distance place. Hence, linear programming is also termed as Extrinsic Programming. Here, all the learners have to proceed through the same frames or in the same order. It is based on theory of operant conditioning. It tells that "A Certain direction can be given to human behavior", for this purpose activities is needed to divide in small parts and make their analysis.

**Characteristics of Linear Programming**

Following are the characteristics of linear programming -

- **Linear arrangement:** Linear programming represents a linear arrangement. Here, all the learners have to proceed through the same frames in the same order.
- **Responses are controlled:** In linear programming the whole instructional process is well controlled by the programmer. Constructed response is an important characteristic of linear programming. There is no freedom of choice to answer in their own way.
- **Small step:** In this programme the learning material is presented into a series of small steps called frames. Each frame carries a single idea, example or rule.
- **Response is emphasized:** Here, emphasis is laid on the response and the learner must respond to each and every frame for learning.
- **Immediate feedback:** In this programme, feedback or reinforcement is quite immediate. Knowledge of result acts as reinforcement and maintains motivation.
- **Prompting:** Prompts or clues are given in the earlier frames in order to minimize probability errors and are generally withdrawn towards the end of the programme.

- **Active participation:** This programme requires active participation from the part of the learner so that it can move smoothly.
- **Self-pacing:** The learner can learn according to his own speed so that the programme moves differently but steadily and that leads the learner from initial to terminal behaviour.
- **Record student's response:** It provides not only stimulus but also the record of the student's response.
- **Proceeds step by step:** In this programme all the small units are presented in a logical order, so that the learner proceeds step by step without missing anything and without committing any mistake.

**Principles of Linear Programming**

Linear programming is based on five fundamental principles -

- Principles of small step.
- Principle of active responding.
- Principle of immediate confirmation.
- Principle of self pacing.
- Principle of student testing.

**Advantages of Linear Programming**

Following are the advantages of linear programming -

- Linear programming highlights the bottleneck in the production process.
- It provides better tools for meeting the changing conditions.
- It improves the quality of the decisions.
- It helps in attaining optimum use of productive factors.

**Limitations of Linear Programming**

Following are the limitations of linear programming -

- **Teacher-pupil contact:** In this programme, the teacher-pupil contact for the development of human personality and relationship was completely lost.
- **Limited topics:** Linear programming is confined to the limited topics and subjects. It is difficult to convert all topics and subjects to programmed materials.

- **Convergent thinking:** Linear programming does not permit differentiation amongst answers; therefore it is unable to develop discriminating power of the learners.
- **Time-consuming:** Programming is an enervating and time-consuming process. To follow the basic procedures of organizing and then writing a programme is a tedious work.
- **Branching or Intrinsic Programming:** The second most popular and conventional style of developing programming is branching programming. Branching or intrinsic program was developed by Norman, and hence this is known as the Crowderian style. It is also known as branching or intrinsic style of programming. It has been defined as "a programme, which adapts to the needs of the students without the medium of extrinsic device such as computer". This style of programming is called intrinsic because here the learner himself makes the decision to adapt the instruction to his needs according to his background of the subject. The underlying principle of branching is that different students need different instructional materials and that the student can learn from his own errors. This principle is quite different from linear programming in which all the students uniformly follow the same sequence of frames irrespective of their background in the subject.

According to Norman, an American technician, branching or intrinsic programming is one which adapts to the needs of the learner without any extrinsic device such as computer. It is not controlled extrinsically by the programmer. This type of program involves multiple choice response patterns. The learner is required to select the right answer out of several responses prevented to him/her. It is based on configuration theory of learning. It is a problem solving approach. It is stimulus centered approach of learning.

**Principles of Branching Programming**

Branching programming is based on three basic principles -

- Principle of exposition

- Principle of diagnosis
- Principle of remediation.

**Assumption of Branching Programming**

Assumptions behind this programming are -

- Student learns better if he/she is exposed to whole situation or content.
- Student errors help in diagnosis.
- Student learns better if remediation is provided side by side.
- Student learns better in democratic environment.

**Limitations of Branching or Intrinsic Style**

Limitations of branching programming are -

- There is every possibility that the learner may guess the correct response without understanding the subject matter of the frame.
- Infinite branching cannot be provided. It cannot cater to the needs of all individuals because it is very difficult to find out the total number of branches to every individual.
- The cost of preparation is very high. Audio-visual equipment is very costly. Programmes are the products of a programmer's imagination and it is he who decides diagnostic questions and level of content. The diagnostic questions may or may not suit the needs of individual learners.
- It is very difficult to ask questions on the whole matter of a frame because frames are too large. Sometimes important subject matter may be left out.
- In a branching programme, through the process of elimination, all students may eventually get through the material. There is no way of knowing, by merely looking at the programme, whether the student has comprehended the material; the fact that he has learned everything the programme is intended to teach.
- This technique does not shape the behaviour of the student as to the way a programme should.
- It does not consider learning process whether learning is taking place or not. Main emphasis is on diagnosing the weakness of

learners and providing remedy to them.

- There is no sequencing of pages. Student finds it difficult to follow the steps. He does not find it exciting or motivating, therefore he does not want to go through these pages.
- More emphasis on remediation rather than teaching. Hence, it is only a tutorial approach.
- **Mathetics Programming:** Mathetics originally comes from the Greek word 'Mathein' which means to learn. Thomas A. Gilbert is the originator of the concept mathetics. According to him, mathetics is the systematic application of reinforcement theory to the analysis and construction of complex behaviour usually known as subject matter mastery, knowledge and skills. Mathetics if applied diligently produces materials that exit the efficiency of lessons produced by any known methods. It is based on connectivist theory of learning. It is a reverse chaining approach. It is based on Principle of Chaining, Discrimination and Generalization.

There are two distinctive types of programming techniques. One technique is the programming of subject material and the other is the programming of behaviour. Both techniques are distinct from each other in their areas of emphasis. Mathetics come under the second type of programming technique, which emphasizes the realization of objectives through performance.

**Advantages of Mathetics Programming**

Following are the advantages of mathetics programming -

- Mathetics programming is a task oriented programme.
- Results can be linked to concrete goals which we intend to achieve through a mathetics programme.
- Its stress on learner success at 90/90 criterion level of mastery motivates the learner.
- It utilizes the principal of backward chaining.
- It is relevant, significant, meaningful and valid in the eyes of the learner and programmer.

**Limitations of Mathetics Programming**

Following are the limitations of mathetics programming -

- Main emphasis is on mastery of the content rather than changes in behaviour of the learner.
- Retrogressive chaining of stimuli if not effective for terminal behaviour.
- It is very difficult to develop retrogressive learning package.
- It is very technical in nature and such as demands a lot of skill, training and labour on the part of the programmer.
- It is not suitable for learning the material of all subjects.
- Mathetics cannot be used for factual content.
- Mathetics is not based on any sound learning theory.

**Assumptions of Mathetics Programming**

Mathetics programming is based on following assumptions -

- Chaining of responses helps in learning to reach up to mastery level.
- Reverse chaining of stimuli helps in learning, i.e. from whole to part, from complex to simple.
- Completion of task provides motivation to students.

Frames size is organized in small step but in a reverse chain i.e. from complex content to its small, simple units to attain mastery level; Frame structure is based on Demonstration-prompts-release. There are two types of frames- 1. Demonstration frames 2. Prescription frames.

Responses are structured responses and responses determined by the programmer. Completion of task provides reinforcement. Wrong responses are ignored. Error helps in discrimination but not in learning. Its main purpose is to develop mastery of the content. Main focus is on mathematics and grammar.

It used for higher classes useful for complex and difficult task. It is useful for developing concepts of mathematics and grammar. It can be used in Distance Education.

- **Computer Assisted Instruction or Learner Controlled Instruction:** Computer is the most important gift of science and technology. It has done miracles in almost all works of life. Today

there is no aspect of our life which has remains untouched with the use and application of computers. Computer is also used in the field of education. Instructional works carried out with the help of computers is generally known as Computer Assisted Instruction or CAI in brief.

Computer-assisted instruction is a natural outgrowth of the application of the principles of programmed learning. The main objective of programmed learning is to provide individualized instruction to meet the special needs of certain individual learners. To accomplish this objective, it needs an efficient and flexible device that can store a massive amount of organized information and use a selected portion to meet the needs of individual learners. The computer is such a device, which can cater to the needs of individual learners by storing heaps of information. It can process the information suited to the needs of individual learners. It can meet a large variety of educational needs, which range widely with respect to educational levels, subject matter, style of instruction and level of learning from simple drill to problem solving.

In short, we can say that computer assisted instruction can be used as an important and effective tool in the teaching of various subjects. The basic principle to all forms of programming is to create a coherent body of knowledge based on careful analysis of the objectives for a particular set of students and gives the student a chance to participate actively in the process of learning, allowing him to test himself without any aid from anyone and to know where he stands.

**Importance of Computer Assisted Instruction (CAI) in the Field of Education**

- CAI can be used in providing sufficient drill and practice.
- CAI can develop problem solving ability of the learners.
- It can also develop creativity of the students.
- It can supplement laboratory and other practical work.
- CAI can provide opportunity for improving self-learning.

- It can provide valuable help in improving language skills.
- It can provide valuable teaching aid for instruction.
- CAI can help in the various areas and issues related to the teaching-learning and school management.
- It can be used for educational research purposes.
- It can be used in evaluation purposes.
- It can act as the best tutor.
- It also helps in the video conferencing classes.
- It helps in power point presentation.

**Difficulties of Computer Assisted Instruction (CAI)**

- CAI is very expensive in the field of education.
- It has no self-thinking capacity.
- Computer is an electronic device; there is a potential danger either to damage machine or damaged by the children.
- The children are dependent only on computers.
- CAI is a sort of mechanical approach to education.

These are actually the ways and means of providing instructions or not the basic format of the programming.



**CHECK YOUR PROGRESS**

**Q 1:** What is programmed instruction?

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**Q 2:** Give one definition of programmed instruction?

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**Q 3:** Write one characteristic of programmed instruction?

.....

**Q 4:** Write one principle of programmed instruction?

.....

**Q 5:** Write one objective of programmed instruction?

.....

**Q 6:** Why linear programming is called extrinsic programming?

.....

**Q 7:** Mention one advantage of programmed instruction?

.....

**Q8:** Mention one disadvantage of programmed instruction?

.....

## 11.10 MERITS OF PROGRAMMED INSTRUCTION

Following are the merits of this teaching strategy -

- A well programmed instruction is a great trust in the direction of individualized instruction.
- It permits individual learner to progress at his own speed.
- Programmed instruction is more successful in critical sagacity (discernment) of the logic of various subjects and inspiring the students to creative thinking and judgment.
- Good teachers are freed from the humdrum of routine class-roomactivity and they are in a position to devote their time to morecreative activities.
- Some educationists fear that the programmed instruction will deteriorate the quality of instruction. On the other hand, the use of it has improved the quality of education in general.
- The use of programmed instruction has bought a revolution in the social setting of the class-room. Many emotional and social problems have been eliminated and problems of discipline have been automatically solved.
- Programmed instruction is a great thrust in the direction of individualized instruction. A well organized programmed instructional device is tailored to cater to the needs of individual students of the class.
- It helps the teacher to diagnose the problems of the individual learner.
- By presenting the material in small segments of information i. e. frame it makes the learning as an interesting game in which the

learner is challenged by his own capabilities.

- The main emphasis is on individual differences and students' involvement.
- There is not fixed time interval for learning. Students may learn at their own pace.
- Learning by doing maxim of teaching is followed to involve learners in the learning process.
- Students are exposed only to correct responses, therefore, possibility to commit errors in reduced.
- Immediate confirmation of the results provides reinforcement to the learners and encourages the learners to proceed further. Feedback is provided to wrong answers, so that learner is able to develop mastery over the content.
- It may be less complicated to keep materials in current programmed instruction unit than it is to update in a textbook.
- Material can be exchanged from country to country and from state to state, giving flexibility and variety to extension offering.
- Programmed Materials can be prepared for and adapted to fit almost any local situation related to nationality, economic or cultural variations in a community.
- The main emphasis is on individual differences and students' involvement. Learners will work individually.
- There is not fixed time interval for learning. Students may learn at their own pace. Students can proceed at their own pace and at time convenient to them. A slow learner is not embarrassed.
- Those who setup programmed instruction units may be motivated to plan their efforts more deliberately and more thoroughly than with traditional teaching.

## 11.11 DEMERITS OF PROGRAMMED INSTRUCTION

Programmed instruction has demerits too, among them are -

- The programmed instructional materials are very costly only rich

nations can afford it.

- Programmed materials have been severely criticized as a threat for the replacement of teachers.
- Programmed instruction does not eliminate competition or grades as often claimed.
- Mere manipulation of machine is not rewarding to children as Skinner seems to think. Once the novelty wears and if, at the start, too many errors appear the pupils loses interest and motivation. Later reinforcements often do not accelerate learning.
- Programmed instruction restricts the learner's freedom of choice resulting in cramping of his imagination and initiative.
- Operant conditioning is found successful only with some pupils, in some cases and not in all. Programmed instruction ignores or makes inadequate provisions for variables like cognitive variables, personality variables and motivational variables.
- The teacher- pupil contact which is so vital for development of human personality and relationship is completely lost.
- In language learning, speech is equally important as development of reading and comprehension skills. But there is no scope for providing this experience.
- It is very difficult to develop an instructional programme.
- Due to tight schedule of time table, students cannot be left to learn at their own pace. It would be very difficult to learn the content the subject matter in a limited period of time.
- There is no chance for students' creativity, their responses are highly structured.
- Development of programme is not economical in terms of cost and time.
- In absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises.
- It cannot be applied at primary level of education or at higher education.

- In absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises.
- Motivation is necessary for students, whether they are staff members or layman, to complete units of programmed instruction. It may be that job promotion in their own organization would be sufficient enticement. Possibly an item in the individual personnel record would motivate him to complete a unit.
- Only cognitive objectives can be achieved. There is no chance for students' creativity, their responses are highly structured.
- Programmed Instruction done on an individual basis at student's home or offices would likely have to be limited to the linear type. While this could be effective, it may not have the potential that more sophisticated computers would have.
- The extension teacher must keep in touch with their students working on units and let them know he is interested in progress and keeping in touch. This may be difficult to do in some cases, like in case of high rate of competition.
- The preparation of programmed instruction material is time demanding, many hours are usually required to produce a unit. Due to tight schedule of time table, students cannot be left to learn at their own pace. It would be very difficult to learn the content the subject matter in a limited period of time.
- The problem of teacher motivation, one of the human factors in programmed learning, must be given attention if this method is to succeed.
- The technique may be new to the particular students and they may not complete units satisfactorily because they don't adequately understand programmed instruction.



**ACTIVITY 11.1**

Give some suggestions for programmed instruction.



## 11.12 LET US SUM UP

- Programmed instruction or programmed learning is one of the important innovations in the teaching learning process. It is an application of the principles of behavioural sciences and technology in the field of education.
- Nature of programmed instruction - it is a method of individualized instruction, here, materials are logically sequenced and broken into suitable small steps of the subject matter called 'frames', it has an adequate provision for feedback, the learner progresses at his own pace, the interaction between the learner and the learning material, based on the behaviouristic principles of psychology, continuous evaluation is possible by the record of student's response, etc.
- Principles of programmed instruction are - principle of small steps, principle of active responding, principle of immediate reinforcement, principle of self pacing, principle of student evaluation.
- Objectives of programmed instruction are - to help the students for learning by doing, to provide the situation to learn at his/her own speed, to help the student to learn without the presence of teacher, to present the mater in a logical manner, to study himself, to evaluate himself, to compare his/her answer with the key.
- The stages of programmed instruction are - preparation, construction or writing of the programme, try out revision and evaluation.
- The types/styles of programming are - Linear Programming, Branching Programming Mathetics and Computer Assisted Instruction.
- Merits of programmed instruction are - a well programmed instruction is a great trust in the direction of individualized instruction, it permits individual learner to progress at his own speed, the use of programmed instruction has bought a revolution in the social setting of the class-room, programmed instruction is a great thrust in the direction of individualized instruction, it helps the teacher to diagnose the problems of the individual learner, the main emphasis is on

individual differences and students' involvement, there is not fixed time interval for learning, learning by doing maxim of teaching is followed to involve learners in the learning process, feedback is provided to wrong answers, so that learner is able to develop mastery over the content, material can be exchanged from country to country and from state to state, giving flexibility and variety to extension offering, etc.

- Programmed instruction has demerits too, among them are - programmed instructional materials are very costly only rich nations can afford it, materials have been severely criticized as a threat for the replacement of teachers, restricts the learner's freedom of choice resulting in cramping of his imagination and initiative, the teacher-pupil contact which is so vital for development of human personality and relationship is completely lost, in language learning, speech is equally important as development of reading and comprehension skills, but there is no scope for providing this experience, it is very difficult to develop an instructional programme, due to tight schedule of time table, students cannot be left to learn at their own pace, it would be very difficult to learn the content the subject matter in a limited period of time, there is no chance for students' creativity, their responses are highly structured, development of programme is not economical in terms of cost and time, in absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises, it cannot be applied at primary level of education or at higher education, only cognitive objectives can be achieved, the technique may be new to the particular students and they may not complete units satisfactorily because they don't adequately understand programmed instruction.



## 11.13 FURTHER READING

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## 11.14 ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** Programmed instruction is an application of the principles of behavioral sciences and technology in the field of education.

**Ans to Q No 2:** According to Edgar Dale, "Programmed learning is a step by step, self-instructional programme, systematic, aimed to ensure the learning of stated behavior".

**Ans to Q No 3:** Programmed instruction is a method of individualized instruction.

**Ans to Q No 4:** Principle of Immediate reinforcement.

**Ans to Q No 5:** To help the students for learning by doing.

**Ans to Q No 6:** In the linear program the learner's responses are controlled externally by the programmer sitting at a distance place. Hence, linear programming is also termed as extrinsic programming.

**Ans to Q No 7:** Programmed instruction permits individual learner to progress at his own speed.

**Ans to Q No 8:** Development of programme is not economical in terms of cost and time.

## 11.15 POSSIBLE QUESTIONS

**Short Questions** (Answer each question in around 150 words)

**Q 1:** What are the characteristics of programmed instruction?

**Q 2:** What are the objectives of programmed instruction?

**Q 3:** What are the styles of programmed instruction?

**Q 4:** Differentiate between linear and branching programming.

**Long Questions.** (Answer each question in around 300-500 words)

**Q 1:** Write briefly about the stages of programmed instruction.

**Q 2:** Discuss the importance of computer assisted instruction in the field of education.

**Q 3:** Discuss the merits and demerits of programmed instruction.

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