Programmed Instruction or

Programmed Learning

By

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Teaching, Instruction and Programmed Instruction (PI)



Teaching: Teaching is the process of attending to people's needs, experiences and feelings, and making specific interventions to help them learn particular things. Teaching is a broader in its scope. Instruction: Is a purposeful,orderly. controlled sequencing of learning experiences to reach a specified goal.

Programmed Instruction: is a sub head under instruction and represents a more rigorous attempt to develop a mastery over specified goals to secure learning Programmed Instruction or Programmed Learning is one of the important Innovation in the teaching-Learning process by using principles of operant conditioning and schedules of reinforcement.

It is a Self Instructional Method

Definitions of Pl

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Acc to R.C. Das(1993)-Programmed Instruction is a method of individualized instruction, where each individual learns by himself at his own rate. Programmed learning consists of elements of new knowledge called Steps, which are arranged in a sequence in such way that a student can easily learn by himself.

G.O.M Leith (1966) -Programme is a sequence of small steps of Instructional material (called frames), most of which requires a response to be made by completing a blank space in a sentence. To ensure that expected response are given, a system of cueing is applied, and each response is verified by the provision of immediate knowledge of results. Such sequence is intended to be worked at the learners own pace as individualized self instruction

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Smith and Moore (1962): Programmed instruction is the process of arranging the material to be learned into a series of sequential steps, usually it moves the students from a familiar background into a complex and new set of concepts, principles and understanding

Gulati and Gulati (1976): Programmed learning, as popularly understood, is a method of giving individualized instruction, in which the student is active and proceeds at his own pace and is provided with immediate knowledge of results. The teacher is not physically present. The programmer, while developing programmed material, has to fallow the laws of behaviour and validate his strategy in terms of student learning.

Meaning of Programmed instruction From the above definition

Programmed instruction / learning is a systematically planned, empirically established and effectively controlled self-instructional technique for providing individualized instruction to the learner through logically sequenced small segments of the subject matter by using the principles of operant conditioning and schedules of reinforcement.

Development or Origin of Programmed Instruction⁷

- Gita is the first example of programmed learning as it has several ingredients of programming.
- The Greek Philosopher Socrates as one of the earliest programmer, who developed a programme in geometry, which was recorded by Plato in the dialogue Menu.
- Programmed instruction emerged in the beginning of the 20th century from the efforts of American psychologists.
- E L Thorndike (!874-!949) was the first Psychologist whose findings were direct relevance to Programming. The law of effect, an outcome of Trial and Error learning theory has a close link with the concept of reinforcement which is being considered for Programme Instruction.

- Sydney L Pressey(1927), Psychologist of Ohio State University developed a teaching machine. This teaching machine contained the format of multiple choice items having provision for immediate feedback. So it is also linked with the origin of Programmed Instruction
- B.F. Skinner (1954), an American Psychologist proposed the Operant Conditioning learning theory, given birth to the concept of reinforcement in the process of learning. Based upon this idea B F Skinner developed Linear Programmed Instruction or Extrinsic Programming.
- Norman A. Crowder (1955) developed another type of programmed instruction known as Branching programming or Intrinsic Programming which provides automatic tutoring.

Contd..

Robert Mager (1958) gave a new concept known as Learner Controlled Instruction, in which learner led the instruction, it is a kind of Socratic dialogue in reverse.

- T F Gilbert (1962) developed a new system of Progammed Instruction known as Mathetics.
- E L Rothkopf (1965) coined another kind of programming called Mathemagenics.

Lawrence Stolurow (1965) revolutionized the concept of programmed instruction in 1965 by bringing the idea of Computer Assisted Instruction (CAI).





Teaching Machines

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Skinner's teaching Machine





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The organization of the content in Bhagavad Gita is an ancient example for programmed material. The Bhagavad Gita contains 700 Shlokas in 18

Chapter	Krishna	Arjun	Sanjay	Dhritrashtra	Total
	0	21	25	1	47
2	63	6	3	0	72
з	40	3	0	0	43
4	41	1	0	0	42
5	28	1	0	0	29
6	42	5	0	0	47
7	30	0	0	0	30
8	26	2	0	0	28
9	34	0	0	0	34
10	35	7	0	0	42
11	14	33	8	0	55
12	19	1	0	0	20
13	34	0	0	0	34
14	26	1	0	0	27
15	20	0	0	0	20
16	24	0	0	0	24
17	27	1	0	0	28
18	71	2	5	0	78
Total	574	84	41	1	700

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Example for Programmed Material

Instruction to Learners

Dear students

- The material which you are finding in this book is not a test material instead it is a SELF LEARNING MATERIAL.
- Read the content given in the Frames and answer the question in the space provided.
- You are expected to be active in the process of learning.
- Most interesting aspect is that you can take your own time to complete learning till the last Frame, but try not to waste the time.
- If you find it difficult to learn and understand at once, you can repeat the learning frames for any number of times.
- Your ultimate goal is to achieve mastery learning by using this opportunity.



Frame 1

Programmed instruction is the process of arranging the material to be learned into a series of sequential steps, usually it moves the students from a familiar background into a complex and new set of concepts, principles and understanding

Frame-2

Answers to Frame-1

1.Material to be Learnt

Programmed learning, as popularly understood, is a method of giving individualized instruction, in which the student is active and proceeds at his own pace and is provided with immediate knowledge of results. The teacher is not physically present. The programmer, while developing programmed material, has to fallow the laws of behaviour and validate his strategy in terms of student learning.

Q1. Programmed instruction is developed based on _____

(Hint: Programmed Instruction is derived from Behavioural Sciences)

Frame-3

Answer to frame 2

- 1. Laws of Behaviour or Laws of learning
- ► Good .. Keep learning

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Q1. Programmed instruction allows individual to proceed in the learning_____

Frame-n (Last frame)

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- Answer to previous frame
- ► 1.Own pace

Congratulations... You are completed learning of one Unit content on your Own.

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Programmed Instruction in the Present

Establishment of first open university in 1969 in UK, establishment of many other open university including Indira Gandhi National Open University (1985) in India and the employment of "Consortium" gave new and modern shape to programmed Instruction with a new name Self Instructional Material (SIM)

This is how the Programmed Instruction is becoming more and more technical by using the systematic and objective principles of Mathematics, Applied Sciences and Engineering. Basically Programmed Instruction originated from psychology of learning and instruction and now it has been developed as one of the important aspect of instructional technology.

Characteristics of Programmed Instruction

- 1. Programmed Instruction provides individualized Instruction, i e one person learns at a time.
- 2. The learning material is logically sequenced and divided into small steps called FRAMES.
- 3. In programmed material, every frame is practically, logically connected to its next frames. Only one frame is presented to student at a time .
- 4. These small steps stress the gradual nature of increasing the complexity and smoothens of the transition from one item to the next. Information grows in depth, changes occur in quality and quantity.
- 5. Learner has to remain active in the process of learning by providing responses. Because the programmed instruction emphasizes the interaction between the learner and the programme, this inturn establishes a pattern off Stimulus -Response interaction.

Characteristics of PI contd..

- 6. Students get to know either the given response is right or wrong. Thus this acts as a immediate feedback.
- 7. Students have the opportunity to learn at their own pace.

8. Specification of student's entering behaviour, level of language, understanding and simplification ability, level of achievement, feedback and mental level are taken into account.

9. Stimulus, Responses and Reinforcement – these elements remain active in it.

10. As feedback is provided immediately, so correct responses are reinforced by providing feedback it helps in effective learning. Every response of a student provides him a new knowledge. 11. While learning instructional material, students have more readiness and curiosity due to which they understand very rapidly.

12. Instruction material is evaluated through the responses of students and it is improved and modified according to that.

13. Programmed Instruction also organizes that aiding instruction to remove the weakness and difficulties of students.

15.Programmed Instruction system is based on the principles of Psychological learning.

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Disadvantages of Programmed learning

- It demands specific skills to develop a good programmed material
- Only cognitive objectives can be achieved
- 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 program is not economical in terms of cost and time
- In absence of a teacher, student 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 level of education

Principles of Programmed Instruction

- 1. Principle of Small Steps
- 2. Principle of Active Responding
- 3. Principle of Immediate Feedback
- 4. Principle of Self Pacing
- 5. Principle of Self Testing or Student Testing

1.Principle of Small Steps

It is a well known fact that a learner learns better if the content matter is presented to him in meaningful small steps. Therefore, in programmed instruction the subject matter is divided into sequenced and meaningful very small steps called Frames, which are presented to the learner one at a time for responding.

2.Principle of Active Responding

In Programmed Instruction a learner is provided information in frames and he is supposed to be very active in responding to the individual frames as the learner is provided only one frame at a time and is allowed to proceed further only on completing learning of the previous frame, thereby keeping him active and meaningfully busy throughout completion of the programme.

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3.Principle of Immediate Reinforcement

The learner understands better when he is motivated to learn by receiving the information of the result just immediately after responding, which is also in accordance with the psychological phenomenon of reinforcement in learning. In programmed instruction it is important to provide immediate results of individual frames so that the learner will get appropriate reinforcement in time

4.Principle of Self-pacing:

The concept of programmed Instruction has actually emerged on the concept of providing learners an opportunity to learn at their own pace i.e by taking there own time for learning.

The programme should be prepared keeping in view the principle of self-pacing, so that the learner can respond and move from one frame to another according to his own speed of learning.

5. Principle of Self Testing or Student – testing

- In programmed learning as the learner gets the results of his learning while the process of learning which provides him continuous evaluation of his own learning.
- In this process the learner has to leave the record of his own response because he is required to write a response for each frame on a response sheet.
- This detailed record helps in revising the programme and acts as a source for studying and improving the complex phenomenon of human learning.

Development of Programmed Instruction

- Application of programmed instruction is illustrated through the step by step construction of short programmes.
- Starting with the analysis of the curriculum and course content, the author take the reader through each phase of the programming process, gathering and organizing the content material, construction of the programme matrix and flow diagram and finally the writing of frames.
- In innovative classroom environment, programmed instruction can be made use to enhance the effectiveness of Self learning among Learners.

Development of Programmed Instruction

Preparatory phase (preparation of the programme)
 Development phase (writing of the programme)
 Evaluative phase (testing or evaluation)

General Format of the Frames

Frame-1

- 1. Stimulus
 - i. Content
 - ii. Question
- 2. Space for Response
- 3. Clue/ Hint(if any)

Frame-2

- 1. **Response to Frame -1**
- 2. Reinforcement/ Feedback
- 3. Stimulus
 - Content
 - ii. Question
- 4. Space for Response
- 5. Clue/ Hint (if any)

Frame 3,4, 5 -----n

Thank You

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