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PROGRAMMED INSTRUCTION

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OBJECTIVES

After studying this content, students will be able to:

- Understand the meaning of programmed learning.
- Know the characteristics of programmed instruction.
- Familiarize with the fundamentals of programmed instruction.

INTRODUCTION

The first teaching machine was invented by Sydney L. Pressey in the 1920s, Skinner in the 1950's introduced a concept of "teaching machine" that differed from Pressey's in some ways. "The teaching machine is composed of mainly a program, which is a system of combined teaching and test items that carries the student gradually through the material to be learned. The "machine" is composed by a fill-in-the-blank method on either a workbook or in a computer. If the subject is correct, he/she gets reinforcement and moves on to the next

question. If the answer is incorrect, the subject studies the correct answer to increase the chance of getting reinforced next time.”

Meaning and definition of programmed instruction

B.F. Skinner has defined this concept as the science of learning and art of learning. "It is termed as instructional technology". which is based on psychological principles of learning.

Definition of programmed instruction

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

(Smith and Moore,1962)

" Programmed instruction is a method of designing a reproducible sequence of instructional events to produce a measurable and consistent effect on the behaviours of every acceptable student."

(Susan Markle,1969)

That means Programmed learning has been defined as a method of giving individualized instructions in which the student is active and proceeds at his own pace and is provided with immediate knowledge of the result.

FUNDAMENTALS OF PROGRAMMED INSTRUCTIONS

Fundamentals of programmed instruction are given below:

1. Stimulus and Reaction
2. Behaviour and Behaviour Repertoire
3. Reinforcement
4. The Transfer of Stimulus Control
5. Feedback
6. Confirmation
7. Prompting
8. Generalisation and Discrimination
9. Gradual Progression
10. Successive Approximation
11. Diagnosis and remediation
12. Retrogressive Chain
13. Learner Controlled Instruction.

These elements are being explained individually as follows—

(1) Stimulus and Response

Such situations, event or person or change in the environment which bring changes to the student's behaviour are called as Stimulus. Stimulus creates a situation for a specific response. In programmed instruction course contents are presented into small fractions in a logical order. Every fraction acts as a stimulus and these fraction prepares students to responses (by creating appropriate situation). Right stimulus instructs students for the proper and right response and provides new knowledge. Since stimulus and response are useful for change in students behaviour and in some way behaviour.

(2) Behaviour and Behaviour Repertoire

By behaviour, we meant to such activities which are performed by students to attain teaching goals. "Behaviour is the total response of the organism to situations of life. It considers inner and overt behaviour and also combines the study of inner mental processes and other outer behaviour." In the context of programmed instruction, a group of stimulus-responses is called as behaviour. response is a unit of behaviour. Stimulus-response collectively develop behaviours. Behaviour Repertoire is that series in which many responses are managed in a group by the logical method.

(3) Reinforcement

Reinforcement is that event which occurs after completion of a process and reinforces that process. In order words, the possibility of the occurrence of that gets increased. "Reinforcement is related to such events of the environment which increase the possibility of a response. New behaviour or change is based on such responses which are powered by the stimulus. Such events or situation of stimulus which create responses are called as reinforcement (*Sharma, 1966*)

(4) The Transfer of Stimulus Control

In the beginning of programmed instruction material, when student responses with Stimulator, he is already familiar to them. As he moves forward, responses help in reaching from the entering behaviour to ending behaviour and stimulus control keeps moving in learning order. This is called as the transfer of Stimulus Control.

(5) Feedback

Feedback is that process in which students are made aware to their weaknesses, faults and errors so that students can improve, also student's good features, good work, their quality and strengths are explained in this process so that they can display them even further into their behaviour. Reinforcement increases the possibility of response while feedback is a powerful tool for change in behaviour. Feedback methods improves the students behaviour, develop them and make desired changes in them.

(6) Confirmation

Confirmation is also called as the third principle of programmed instruction. The feedback is immediately provided that students' response is correct due to which students move forward. Confirmation is a form of feedback due to which students attain new knowledge and also reinforcement is provided to them. Student gets the completeness of teaching material by moving forward through ordered fractions based on confirmation of his response.

(7) Prompting

In programmed instruction student have to response for every fraction for which an extra stimulus is used. This is called a Prompt. Any information contained in a frame to help the learner to respond correctly is known as prompt or cue. This will prevent students from making the wrong response.

(8) Generalisation and Discrimination

The ability to acquire the skills, aptitude and knowledge etc. In a situation and to response them in a similar situation for the same elements is called generalisation.

(9) Gradual Progression

In programmed instruction, students are slowly moved from a chain of entering behaviour to ending behaviour through gradual progression. In gradual progression, this matter is taken care of. Student develops complex behaviour through slow response. Each fraction of the content has an arrangement that which students will gradually move up on the path of progress by relating the student's prior responses to his further responses.

(10) Successive Approximation

In programmed instruction material the prior response of learner are reinforced. The processes required to reach the ending behaviour are divided into small fraction in according to the logical sequenced method. Learner's responses reach near the ending behaviour by reinforcing at every fraction on the basis of successive approximation.

(11) Diagnosis to provide remedial instruction

Diagnosis and Remediation refers to provide remedial instruction on students according to their needs, weaknesses and difficulties by diagnosis their difficulties and weaknesses. Student's remediation should be done on the basis of their diversity. When student makes incorrect response then his difficulty, fault or weakness gets noticed for which he get remedial instruction on wrong-page and he receives instruction from material to improve his fault.

(12) Retrogressive Chain

To reach the level of mastery, a progressive chain is followed in the linear programmed instruction but T.F. Gilbert has used retrogressive chain in his instruction. Opposite to progressive chain, this chain is started from the endpoint and is ended at the starting of the chain such as reverse counting or to learn reverse multiplication table (from 100 to 1). This chain is more useful in math.

(13) Learner Controlled Instruction

This concept is the contribution of Robert Mager. The importance is given to students in this instruction. For preparing programmed instruction material, student-centered instruction sequence is more effective than any other instruction sequence. So it should be used at the beginning of preparing instructional material, then we should move further by establishing relationships with the objectives. It helps making instruction student- centered.

MAJOR FUNDAMENTAL PRINCIPLES OF PROGRAMMED LEARNING OR INSTRUCTION ARE THE FOLLOWING:

1. Principles of small steps
2. Principal of active responding
3. Principal of immediate reinforcement
4. Principal of self- pacing
5. Principal of knowledge and progress of student testing

CHARACTERISTICS OF PROGRAMMED LEARNING MATERIAL

Following are the main characteristics of Programmed Learning Material—

1. Programmed Instruction is individual and only person learns at a time.
2. The learning material is divided into small units.
3. Then small units are sequenced.
4. In programmed material, every phase is practically logically connected to its next phase.
5. Learner has to make active responses.
6. Information is immediately provided to students that their effort is right or wrong. Thus they receive the feedback.
7. Students get the opportunity to learn at their own pace. (Principle of Self Pacing)
8. Programmed material fully verified and liable.
9. Specification of student's entering behaviour and feelings are done in it. In this behaviour, level of language understanding and simplification, level of achievement, feedback and mental level are taken into account.
10. Stimulus, Responses and Reinforcement – these elements remain active in it.

11. It has a comparatively low error rate and fault rate.
12. As feedback is provided immediately, so true responses are enforced to students which helps in effective teaching. Every response of student provides him a new knowledge.
13. While learning instructional material, students have more readiness and curiosity due to which they understand very rapidly.
14. Instruction material is evaluated through the responses of students and it is improved and modified according to that.
15. Programmed Instruction also organizes that aiding instruction to remove the weakness and difficulties of students.
16. Programmed Instruction system is based on the principles of Psychological learning.

TYPES OF PROGRAMMED INSTRUCTION

1. Linear Programming
2. Branching Programming

KEYWORDS

- Instruction - Guidance
- Readiness - Ready, Prepared

SELF-CHECK QUESTIONS

1. Write the definition of programmed instruction.
2. Explain the fundamental principles of PI.
3. Write the characteristics of programmed learning material.
4. Write the limitations of Programmed Instructions.

SUGGESTED READING

1. *Educational Technology - S.K. Mangal,*
2. *Educational Technology - R.A. Sharma*

TOPIC(S) FOR NEXT CLASS

1. Linear Programming

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