



Dept. of Education, Patna University
EDUCATIONAL TECHNOLOGY & ICT

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E-Content by: Asst. Prof. Bibha Kumari

LINEAR PROGRAMMING

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OBJECTIVES

After studying this topic, students will be able to:

- Understand Structure of Linear programming.
- Be aware of the characteristics of linear programming.
- Know the limitations of Linear programming.

INTRODUCTION

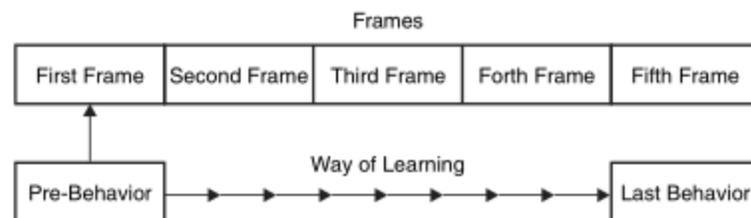
The credit of linear programming style goes to B. F. Skinner. Linear programming style is related to “operant conditioning”. Operant conditioning states that human behavior is shaped through suitable reinforcement to the responses. It tells that “A Certain direction can be given to human behavior”, for this purpose activities is needed to divide in small parts and make their analysis. It is a gradual process and the responses are conditioned in a step by step manner.

In a linear programming, learner’s responses are controlled externally by the programmer sitting at a distant place. A linear programming is called a straight line programming as the learner starts from his initial behaviour to the terminal behaviour following a straight line. The student proceeds from one frame to the next until he completes the programming.

The goal of early developers of programmed instruction was to design the instructional activities to minimize the probability of an incorrect response (Beck, 1959). However, much has been made of the distinction between what some have called Crowder's (1960) multiple-choice branching versus Skinner's linear-type program. Crowder, like Skinner (1954, 1958a) likens his intrinsic system to a private tutor. Although Crowder himself claimed no theoretical roots, his method of intrinsic or linear programming or "branching," was developed out of his experience as a wartime instructor for the Air Force. In a sense they were talking about two very different things. Skinner was writing about education and Crowder was writing from his experience in the teaching complex skills to adults with widely varying backgrounds and abilities. The issue is informative, however. Neither man wanted errors per se

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Frames Arrangement in Linear Programming



In this strategy subject matter is presentational in small steps in sequence. Every step provides a new knowledge or new information. The learner has to emit right response on each step, the response is integral part of the terminal behavior. The learner takes a time is known as 'frame'. The steps are arranged in a gradual progression.

The response of above the first frame functions as stimulus to the second frame. The second response functions as stimulus to the third step frame. The learner has follow the sequence of the frame which is based on learners performance.

Every frame of the linear programming has three aspects:

1. Stimulus
2. Response and
3. Reinforcement

Stimulus

The Linear programming is based on operant conditioning theory of learning, therefore the process of learning in this strategy is based stimulus-response (S-R) connections. The main emphasis is given to environment or situation. The stimulus is presented in content form. It functions as independent variables. The contextual stimulus provide the situations for the response. It is not sufficient enough to emit the desired response, therefore, additional stimulus or prompts are used to help the learner for emitting desired responses. Thus, the prompts are essential aspect of stimulus.

Response

The learner has to emit the desired response for the stimulus. The response function as dependent variable. The nature of response depend on the form of stimulus. The learner acquires new knowledge by emitting correct response. Every response provides new knowledge and it is the integral part of desired behavioral change.

Thus, in Linear programming a response serves three fold functions.

- a) The correct response provides new knowledge or acquires new behavior.
- b) The responses from behavior repertoire to lead to the terminal behaviors.
- c) The confirmation of response provide the reinforcement to the learner.

Reinforcement

The learner has to confirm his response by comparing with correct response. The correctness of the response provides pleasure to the learner, thus he is reinforced to go to the next frame. The correct response provides knowledge of result or desired change in the behavior. It establishes new connection between stimulus and response. This process is termed as 'confirmation'.

CHARACTERISTICS OF LINEAR PROGRAMMING

Its major features are given below—

1. A linear programming is accompanied with a self explained set of instructions to use it, a precisely written statements of entering and terminal behavior an assessment test.
2. The linear programming are arranged in a logical sequence in order of increasing difficulty and complexity of concept and skill. The programming advance in minimal in assessments leading from entering behavior step by step.
3. All students have the same path, which eventually reach the final goal.
4. To simplify the learning initially used prompts or signals, later gradually removed.
5. Response and the order of placed is control.
6. The creation of teaching materials and presentations in programming is thus likely that the student's.
7. It is based on principles of learning psychology.
8. The self - study the path - paved so that students of different mental levels—may have a chance to learn at their own pace.
9. Printing of the program is neat and clean and it is free from mistakes.
10. Active student learning time, and ready to become operational.
11. Students without teacher easily receive new knowledge.
12. Each correct response is enforced by the student, the learning process becomes more effective.
13. This method is more effective than traditional teaching.

LIMITATIONS OF LINEAR PROGRAMMING

1. In this order is the same for all learner. The needs of the learners are not considered properly. Creative and higher objectives are not possible. It can be used only to achieve the lower cognitive objectives.
2. The factual text - is less useful in learning objects. The explanatory text - is only to objects.
3. This learning occurs in controlled conditions, so students do not have the freedom to responses.
4. It's not easy to do. Many times after training it is difficult and time consuming process to make good programming material.
5. It is not possible remedial teaching.
6. The linear programming does not suit the creative or bright students. Crowder says that linear programming is an insult to talented students.
7. It does not provide social motivation to learner which is important for human learning.

KEYWORDS

1. Gradually - slowly
2. Factual - actual
3. Programming - a way of expressing human behavior
4. Presential - immediate / relating to present.

SELF CHECK QUESTIONS

1. Explain the frames of linear programming.
2. Write the characteristics of linear programming
3. Write the limitations of linear programming.

SUGGESTED READING

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

TOPIC(S) FOR NEXT CLASS

1. Branching Programming

Contact :

Email id. - hrntbibha@gmail.com

Mobile no. - 9905623081