WELCOME

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2. Programmed instruction
Programmed Learning – Main Features of Programmed Learning. Its Basic principles
Programmed Learning

• The origin of modern programmed instruction is from the psychology of learning and not from technology.
• It is an application of 'operant conditioning' learning theory to teaching-learning situations.
• It got historical momentum only after the publication of "the science of learning and art of teaching" articles by B.F. Skinner in 1954.
Meaning and Definition

• highly individualized instructional strategy for the modification of behaviour.
• Used for instructional purpose it can also be employed as a mechanism of feedback device for improving teaching efficiency.
• student is active, proceeds at his own pace and is provided with immediate knowledge of result.
• The physical presence of teacher is not essential in this strategy.
• Susan Markle defines

• "It is a method of designing a reproducible sequence of instructional events to produce a measurable and consistent effect on behaviour of each and every acceptable student."
Principles of Programmed Instruction

• 1. Principle of Small Step
• 2. Principle of Active Responding
• 3. Principle of Immediate Confirmation
• 4. Principle of Self-Pacing
• 5. Principle of Student-Testing
Objectives of Programmed Instruction

- (a) To help the student to learn by doing.
- (b) To provide the situation to learn at his own pace.
- (c) To help student to learn without the presence of a teacher.
- (d) To present the content in a controlled manner and in logically related steps.
- (e) To study by himself and assess his own performance by comparing with it the given answer.
Steps in Development of Programmed Instruction

1. Selection of the topic to be programmed.
2. Identification of the objectives.
3. Content analysis for developing the instructional procedure.
4. Writing objectives (Entering and Terminal) in a behavioural terms.
5. Constituting criterion test.
6. Deciding appropriate paradigm and strategy of a programme.
7. Writing programme frames and individual try out.
8. Group try out, editing the programme and preparing final draft.
9. Master validation or evolution of programmed instruction in terms of internal and external criteria.
Types of programmed learning – Linear Programming, features, Limitations
Linear Programme

- The application of operant conditioning model of teaching
- 'Linear Programming' or 'Skinnerian Programming' or Extrinsic Programming.
- B. F. Skinner (1954) prof, of psychology developed 'Operant Conditioning' theory of learning
- Programmed learning grew out of the model of operant conditioning.
- Associates and co-workers of Skinner gave momentum to programmed instruction.
- It is being used for solving the following problems of education
• 1. Individual Differences
• 2. Learning by Doing
• 3. Remedial Learning
• 4. Reinforcement
• 5. Knowledge of Success
Characteristics of Linear Programmed Instruction Material

- 1. Programmed Instruction is individualized.
- 2. Programming device presents material to be learnt in minimal increments. It operates the principle that we learn better in small steps.
- 3. Teaching material is carefully ordered.
- 4. Students' progress at their own pace. His rate of working is establishing by the performance alone.
- 5. The student's answer is checked simultaneously against the correct response, which appears before the next question is asked.
Types of Linear Programme Frames

1. Introductory Frames — The main function of introductory frame is to relate entering behaviours of learners to terminal behaviours.

2. Teaching Frames — The main purpose of teaching frames is to impart new knowledge. The responses of teaching frames are related to terminal behaviours.

3. Practice Frames — The purpose of practice frames is to practice the acquired new behaviours through teaching frames.

4. Testing Frames — The main focus of testing frames is to assess as to how much have the students learnt. These frames are related to terminal behaviours.
Characteristics of a Good Linear Programme

- 1. It is precisely written in transparently communication media and optimum size.
- 2. Its printing is neat and clean and it is free from mistakes.
- 3. It is accompanied with a self-explained set of instructions
- 4. Its items are arranged in a logical sequence in order of increasing difficulty and complexity of concept.
5. It controls the individual difference of the learners.
6. It provides reinforcement to the learners.
7. It is designed in logical sequence of content structure.
8. It provides the learning by doing situation.
9. In it difficult concepts can be taught effectively.
Limitations of linear Programming

1. Every learner has to follow the same linear path.
2. It may used only to achieve the lower cognitive objectives.
3. It may be used to teach the conceptual and explanatory content but factual content cannot be taught.
4. It generates controlled learning situation.
5. It does not suit the creative and bright students. Norman A. Crowder says that Linear programming is an insult to intelligent students.
6. It is a difficult and time consuming process to develop and prepare good programmed instruction material.
7. It does not provide social motivation to learner which is important in human learning.
Branching programme – features, Backward branching and Forward Branching, Advantages & Limitations.
Branching programme

• Objection Against Linear Programming
• Linear programming is based on the learning principles formulated by conducting experiments on animals
• Linear programme is an insult to the intelligent or bright students
• The development of an effective linear programme is a far more difficult task
• Linear programming provides psychological reinforcement; to the learner, there is no place for social motivation.
• In linear programming every learner has to follow the same linear path
Origin of Branching Programming

• In 1954 Norman Crowder, psychologist with United State Air force.
• He was asked to investigate the training of aircraft maintenance men.
• These technicians were being taught to 'trouble shoot' or repair faults, in a bomber navigation system;
• Branching programming started by way of an ordinary practical training problem.
Branching programming makes no assumption about the nature of learning process.

It has no theoretical basis about how education should be conducted.

The student is given a short discussion of the material to be learnt, followed by a multiple choice question designed to test the point just discussed.

Each answer alternative has a page number beside it. The student chooses what he believes is a correct answer to the question.

He turns to the page number given for that answer.

If he has chosen correctly, he is led to next item.

If he has chosen incorrect answer, he is directed to a page wherein the reason for incorrectness is dismissed.

Crowder's approach is based on the psychology of individual differences.
Basic Theory of **Branching** Programming

- Branching provides more information per frame.
- It employs multiple choice response pattern.
- A student is required to discriminate and choose the one right answer which is presented along with a number of other plausible but incorrect answers.
- The assumption in branching programming is that a wrong response does not necessarily hinder in learning of a correct response.
- In a branching programme, the response takes the form of a choice of various answers.
- Branching programme is arranged in a logical sequence of information.
Branching programming is also termed as *intrinsic programming.*

- Learning process is pure internal or intrinsic.
- After exposure to the programme material the student has to discriminate a correct answer from the given multiple-choice questions. This process is within the learner.
- The major rationale for the word *intrinsic* is that the student's response is controlled by himself internally.
Fundamental Principles of Branching Programme

• 1. Principle of Exposition
  – The learner should perceive the whole phenomena exposed to him.

• 2. Principle of Diagnosis
  – It refers to identifying the weakness of learner.

• 3. Principle of Remediation
  – Diagnosis provides the basis for remediation. Remedial instructions are provided on Wrong page.
Characteristics of Good Branching Programming

1. Individualized Instruction
2. Freedom to respond
3. Remedial
4. Tutorial.
5. Compared to—Linear programme is easier to develop branching programme frames or instructional material.
6. Branching—Programme has its roots in human training and techniques whereas linear programming is based on psychological experiments conducted on animals rats and pigeons.
7. Cognitive

8. Multisided—Branching programming is effectively use for teaching as well as remedial purpose.

9. Motivation

10. Content—It can be used for conceptual as well as descriptive content of teaching.

11. Teaching—The branching is mainly concerned with teaching and instruction rather than learning.
Structure of Branching Programme Frame

• In this strategy content is not presented in small steps but whole unit or concept is presented.
• The size of step may be a paragraph or two or whole page.
• The learner perceives the whole concept and tries to comprehend.
• He has not to follow the sequence pages.
• Therefore, branching programming text is known as 'Scrambled text'.
• It consists of two types of pages.
  - 1. Home page
  - 2. WrongPage
<table>
<thead>
<tr>
<th></th>
<th>Page-1 Information</th>
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<tbody>
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<td>(a)</td>
<td>.................................. .. See Page X</td>
</tr>
<tr>
<td>(b)</td>
<td>. . . .. See Page Y</td>
</tr>
<tr>
<td>(c)</td>
<td>....... ........ ........ ........ ..... .. See Page Z</td>
</tr>
</tbody>
</table>
The home page involves four activities

- Teaching
- Response
- Diagnosis
- Reinforcement
Wrong page

- Page 9 from page 1

- Confirmation
  - Your response is not correct

- Remediation
  - Because ................................

- Guidance
  - Now you go back to page (1), and try to choose the correct response
Backward branching and Forward Branching

- Frame 1 – choosing the answer– if it wrong – go to wrong page – diagnosis – coming back to the frame 1 – again next attempt.
- Thus coming back and going forward

- Frame 1 – choosing the answer– if it wrong – go to wrong page – diagnosis – remedial – going to the second frame.
- Thus not coming back and going forward
Advantages

• serves four functions—(a) Teaching, (b) Diagnosis (c) Remediation, and (d) Reinforcement.
• based on the principles of problem solving. It generates appropriate situation of learning.
• Based on individual difference the scrambled text-book operates as tutorial strategy
• Home pages consists of presentation and diagnosis with the help of multiple-choice question.
• The focus of scrambled text is to provide remedial instruction and teaching.
Limitations

- The learner has to select a response from given multiple-choice alternatives. He may select his response by guessing without comprehending the concepts.
- The scrambled text-book cannot he used effectively for primary students.
- It has no sound theoretical formulation or theory.
- It cannot be used for preparing instruction material in every school subject.