Programmed Learning
or
Programmed Instruction

K.K. Chauhan

(Assistant Professor)

Department of Education,

C.S.J.M. University, Kanpur

Email: aprof.kkc@gmail.com

Self-Declaration

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K.K. Chauhan

Introduction

- In 1920, **Sydney L. Presse** (Psychologist in Ohio State University, America) developed a **teaching machine** by which a series of **questions is presented in front of students and they got the information whether their answer is right or wrong immediately** after answering the question.
- By getting the knowledge of their **progress, students doubles their effort** to reach their fixed goals by getting inspired with the **effective manner**.
- After 1950**, B.F. Skinner** researched their learning and developed a **self-teaching material**. This material is named as Programmed Learning or Programmed Instruction.
- Its main focus is to bring desirable change in the **cognitive domain** of the learner's behavior.

- Programmed instruction can be delivered through **various media, including printed textbooks, audio recordings, and computer programs.**
- Historically, programmed instruction was often presented in the **form of printed materials with blank spaces or multiple-choice questions** for learners to fill in or choose from.
- With advancements in technology, c**omputer-based programs and software have become common platforms** for delivering programmed instruction.

First Screen

Bobby _____ up the flute and began to _____ into it to make _____.

ran	look	music
picked	jump	picture
tossed	blow	play

Second Screen

Bobby _picked_ up the flute and began to _blow_ into it to make _play_.

ran	look	music
picked	jump	picture
tossed	blow	play

Third Screen

Bobby _picked_ up the flute and began to _blow_ into it to make _play_.

		music
		picture
		play

DEFINITIONS

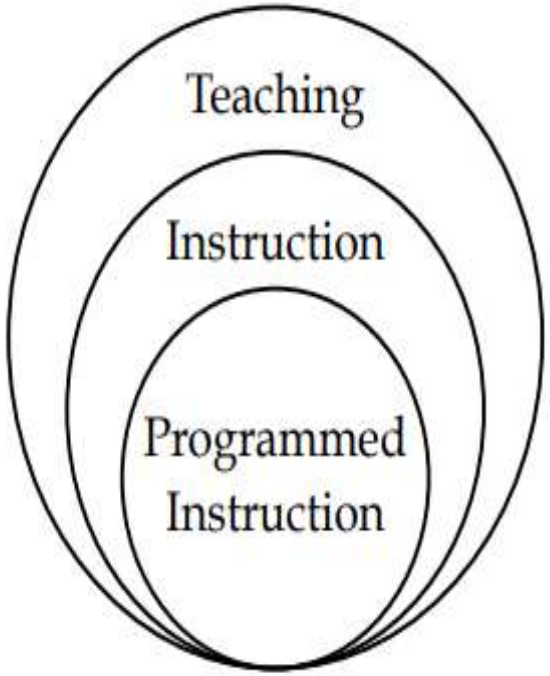
- “Programmed learning refers to the arrangement of instructional material in progressive sequences” -**Harold W.Bernard.**
- “Programmed learning is a systematic, step by step, self-instructional programme aimed to ensure the learning of stated behavior” **-Edger Dale.**
- “Programmed learning is the first application of laboratory technique utilized in the study of the learning process to the practical problems of education” **-Skinner.**

- **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.
- **Leith (1966):** Programmed is a sequence of **small steps of instructional material (called frames)**, most of which require a response to be made by completing a blank space in a sentence. To ensure that expected responses are given, a system of queuing is applied and each response is verified by the provision of immediate knowledge of result.
- **Susan Markle (1969):** It is a method of designing a reproducible sequence of instrumental events to produce a measurable and consistent effect on the behaviour of each and every acceptable student.
- **Espich and Williams (1967):** Programmed instruction is a planned sequence of experiences, leading to proficiency in terms of stimulus responses relationship, that have proven to be effective.

Goal of Programmed Instruction

- The underlying goal of programmed instruction is to facilitate **active engagement**, **self-pacing,** and **individualized learning**.
- It allows learners to progress at their **own pace**, **receive immediate feedback**, and **reinforce their understanding** of the material.
- Programmed instruction can be particularly effective for **teaching factual knowledge**, **procedural skills**, and **step-by-step processes**.

Teaching, Instruction and Programmed Instruction



Teaching, Instruction and Programmed Instruction

Programmed Learning and Programmed Instruction

- ✓ Programmed Instruction and Programmed learning are considered as same of each other in education sector.
- ✓ **British teachers** like to use the **Programmed Learning** Phase while **American teachers** like to use the **Programmed Instruction** phase.

Programmed Instruction and Educational Technology

- ✓ **Educational technology** **b**oth the hardware approach and software approach are learned in this approach.
- ✓ **Programmed Instruction** is a soft approach which tries to bring desired changes in the students behaviour, so it only a part of educational technology.

Principles of Programmed Learning

- ✓ 1. Principle of Behaviour analysis
- ✓ 2. Principle of Small fractions
- ✓ 3. Principle of active participation
- ✓ 4. Principle of immediate feedback
- ✓ 5. Principle of Self pacing
- ✓ 6. Principle of legality of the content
- ✓ 7. Principle of knowledge and progress of students tested
- ✓ 8. Principle of student responses

Characteristics of Programmed Learning Material

- Programmed Instruction is **individual** and **only person learns at a time**.
- The learning material is divided into **small units**.
- Then small units are **sequenced**.
- Programmed material, every phase is **connected logical manner.**
- Learner has to make **active responses**.
- Information is immediately provided to students that is **right or wrong**. Thus they receive the **feedback**.
- Students get the opportunity to learn at their **own pace.**
- Programmed material fully **verified and liable**.

- Specification of student's **entering behaviour are done** in it.
- In these behaviour, **level of language understanding** and **simplification**, **level of achievement**, **feedback and mental level** are taken into account.
- **Stimulus, Responses and Reinforcement** – these element remain **active** in it.
- It has **comparatively low error rate and fault rate**.
- 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**.
- While learning instructional material, **students have more readiness and curiosity** due to which they understand very rapidly.
- Instruction material is **evaluated through the responses** of students and it is improved and modified according to that.
- Programmed Instruction also organizes that **aiding instruction to removing the weakness and difficulties of students**.
- Programmed Instruction system is based on the **principles Psychological learning**.

Application of Programmed Instruction in Education

It is used not only in education but also in other fields. In the field of education, it is used in the following areas-

- ✓ For the education of special types of children.
- ✓ In the field of distance and adult education.
- ✓ In the field of mass education and self-education.
- ✓ In the field of teaching-training.
- ✓ In the field of guidance and remedial training.
- ✓ In the field of correspondence education.
- ✓ In preparing radio industrial lessons.
- ✓ In the field of non-formal and continuing education.

Steps in Programming:

1. Topic Selection:

The programmes should select the **most familiar topic;** otherwise he has to take the **help of a subject expert.**

2. Content Outline:

After topic selection, its **outline may be prepared which cover all the materials**, one plans, to teach. For this programme one has to refer to examine relevant books and materials.

3. Instructional Objectives:

Instructional **Objectives must be formulated** which involve both task description and task analysis. The former is the **description of terminal behaviours** which the learner is **expected to achieve** and the latter is the series of component behaviours that he is required to acquire in the process of achieving terminal behaviour.

4. Entry Skill/Behavior:

The learner should have some **pre-reqisite ability and skill** to understand properly the new programme. This background experience is called the entry skill and a **suitable programme cannot ne prepared without proper assessment** of the entry skill.

5. Presentation of the Material:

Suitable format is to be decided for **presenting the material from the educational point of view**. Then the programmed material should be presented in a sequence of frames arranged as steps **towards terminal behaviour.**

6. Student Participation:

On analysis of the terminal behaviour one will find the **critical responses of the students.**

Using Prompts • Prompts are provided in the programme frame to guide the student to the correct response. Prompts are supplementary stimuli; they are added to a frame to make the frame easier but are not sufficient in themselves to produce the responses.

7. Terminal Behaviour Test:

The effect of programme can be ascertained by administering the terminal behaviour test. It is also known as **performance assessment**. This provides **feedback to the programme and shows the effectiveness of the instructional materials**.

8. Revision:

Lastly the **programme may be revised** on the basis of feedback. The instructional materials **may be edited and modified** according to the needs and requirements of the target audience.

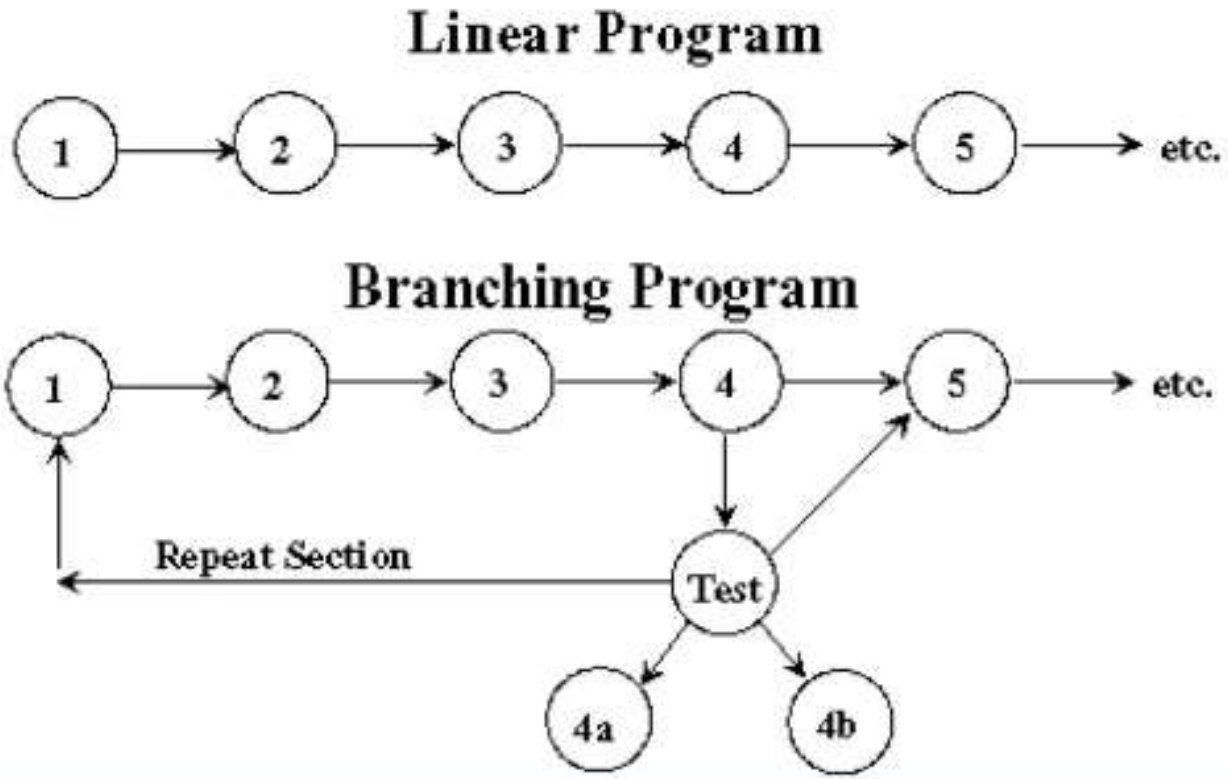
Programmed Instruction and Traditional Method of Teaching

Programmed Instruction	Traditional Method of Teaching
1. This instruction is individual.	1. Generally it is a group technology.
2. In this method, material is presented one by one (in a logical manner).	2. In this, complete material is presented in a collective manner.
3. Immediate feedback is provided to students.	3. Immediate feedback is not provided to students.
4. Objectives are defined clearly. In other words educational objectives are written in behavioural dictionary.	4. Since education objective have wide format so neither they are clearly defined nor can be used properly in communication.
5. Teacher prepares instructional material with complete attention, purity and precautions.	5. Very less preparation occurs.
6. Students have active collaboration in learning.	6. Mostly, students remain inactive.
7. Efforts are made to improve programmed instruction on the basis of the evaluation of students responses.	7. It is difficult to improve or change traditional teaching method on the basis of students responses.
8. Psychological learning and teaching principles are used.	8. It is not possible to use teaching principles completely.
9. It is student-centred.	9. It can be student-centred or subject-centred.
10. Special attention is given to individual diversity.	10. It is not possible to give attention to individual diversity.

Types of Programmed Instruction:

- **Linear Programming**. It is being used for teaching all subjects. In programed teaching strategy progressive **chain elements are presented**. **Last step is at the mastery level**. It is based on five fundamental principles.
    I. Small steps
    II. Active responding
    III. Immediate confirmation/feedback
    IV. Self-pace
    V. Student testing
- **Branching Programming.** It is generally used in mechanical fields.
- **Mathematics**. Retrogressive chain of elements is presented. **First step is the master level while the last step is the simplest element.**

TYPES OF PI


Linear Program
1
2
3
4
5
etc.
Branching Program
1
2
3
4
5
etc.
Repeat Section
Test
4a
4b

Programmed Instruction:
Linear Programing

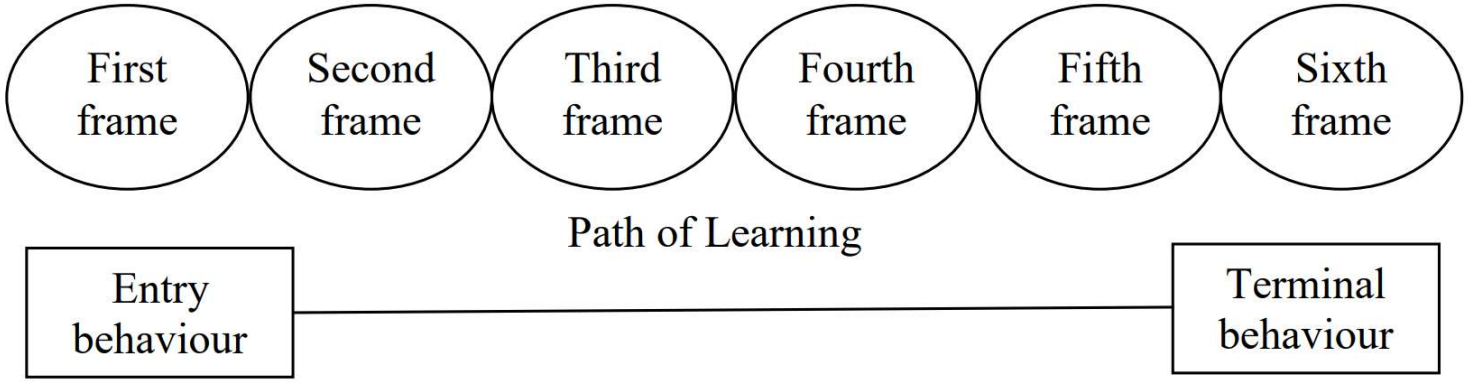
Introduction

- **B. F. Skinner (1955)** was the exponent. It is based on **operant conditioning on programming** which explains that **human behavior can be given a certain direction and the desired behavior can be taught**. The actions of this pathway in the human small - small to analyse the meaningful parts. By resorting to these parts at each position by enforcing the desired behavior can be taught human.
- In fact, the linear programming linear programming in which **each student is in order, crossing certain positions.**
- **B. F. Skinner –(**Burrhus Frederic Skinner)

It includes the following things—

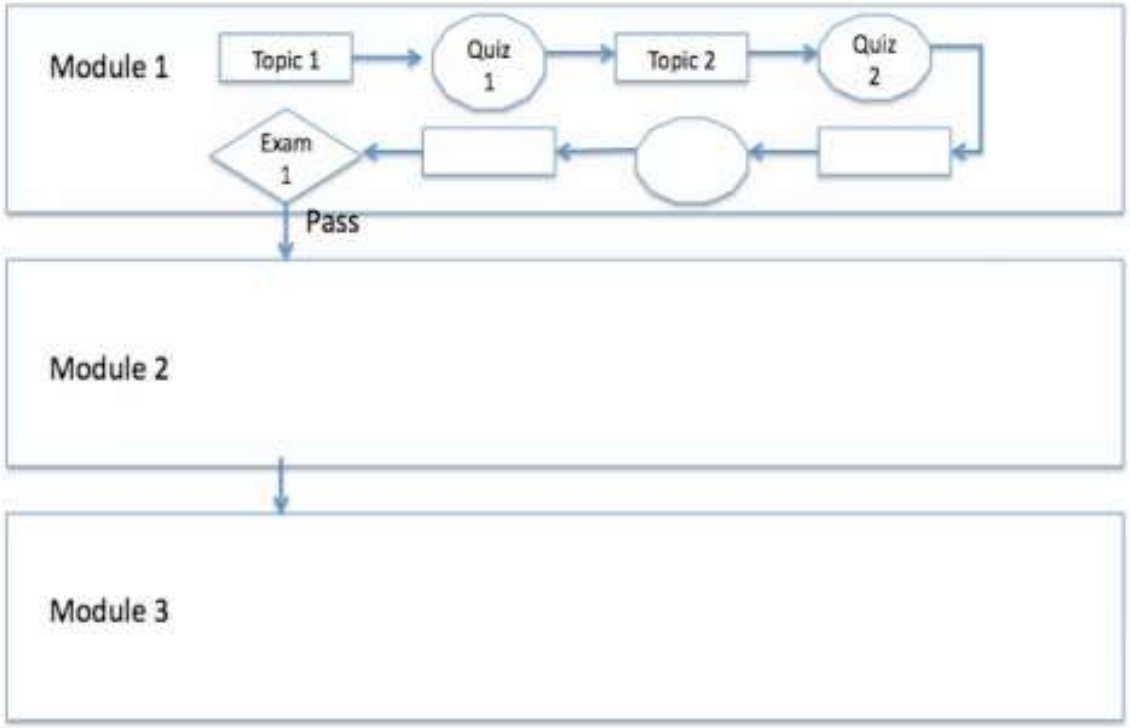
- ✓ (a) At one time, subject to the small - fraction is presented to the students.
- ✓ (b) By responding to student answers.
- ✓ (c) By matching your answer enforcing student receives the correct answer.
- ✓ (d) He received the command what to do next.

Frames Arrangement in Linear Programming



Arrangement of frames in liner programming

Linear Design



- In linear programming the learner has to go through the same frames and the same order. Overall control is complete assignments and control program is making.
- Linear programming is also called the **external programming.**
- Under linear programming students are **given the knowledge of being right or wrong answer.** If the answer is correct, then it is enforcing. Then he goes on ahead to the next step. Such a position after question after question answers—Reinforcement and then the second term, questions, enforcing goes on, until he reaches the last practice.

Characteristics of Linear Programming

- Sort the student as various short—short positions through a linear path of movement behavior reaches the other end.
- Checking the student's response is correct for response home-nutrition system.
- All students have the same path, which eventually reach the fi nal goal.
- To simplify the learning initially used prompts or signals, later gradually removed.
- Response and the order of placed is control.
- The creation of teaching materials and presentations in programming is thus likely that the student's error is almost over

- It is based on principles of learning psychology. Notes
- The self - study the path - paved so that students of different mental levels—may have a chance to learn at their own pace.
- It’s hard Conceptions programming able to clear easily and cheaply.
- Active student learning time, and ready to become operational.
- Students without teacher easily receive new knowledge.
- Each correct response is enforced by the student, the learning process becomes more effective.
- This method is more effective than traditional teaching.

Limitations of Linear Programming

- In this order is the same for all students. Students' individual needs are not taken into account.
- Creative and higher objectives are not possible.
- The factual text - is less useful in learning objects. The explanatory text - is only to objects.
- This learning occurs in controlled conditions, so students do not have the freedom to responses.
- It's not easy to do. Many times after training it is difficult to make good programming.
- It is not possible remedial teaching.
- Talented students take little interest in it.

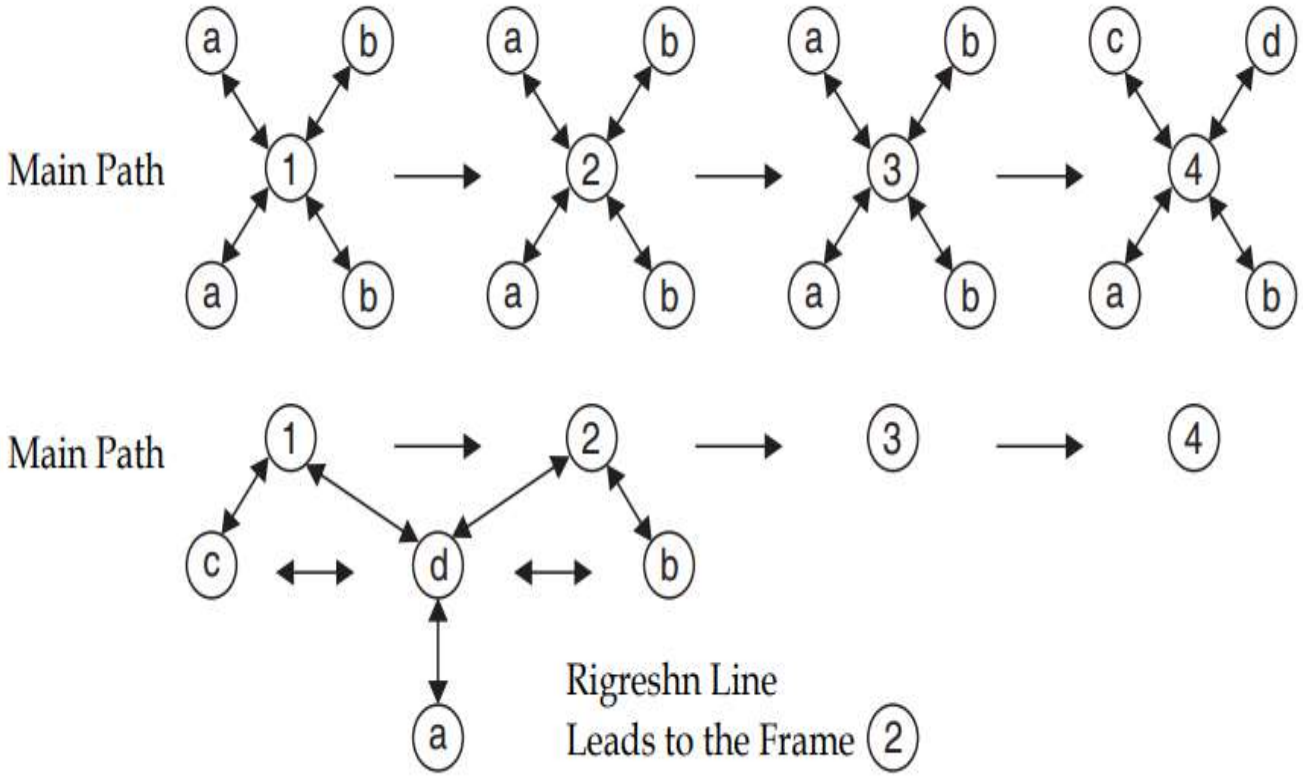
Programmed Instruction: Branching Programming

Introduction

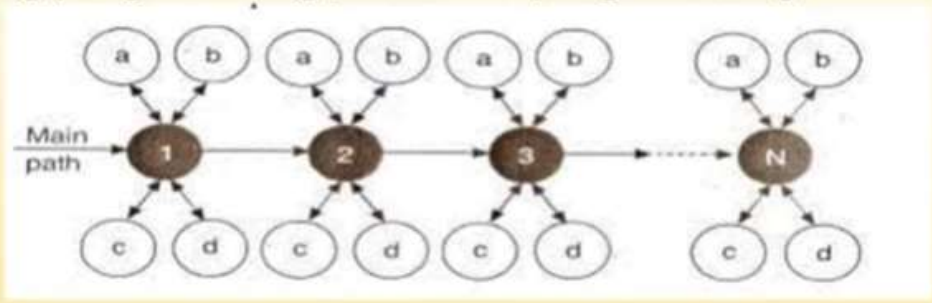
- Mr. Naurman was the exponent of disciplinary programming. Crowder said, “The programming content is a technical submission. There are several principles of effective teaching is used. All schduled activities are controlled by the student so it is also called **internal programming**.

Frames Arrangement in Branching Programming

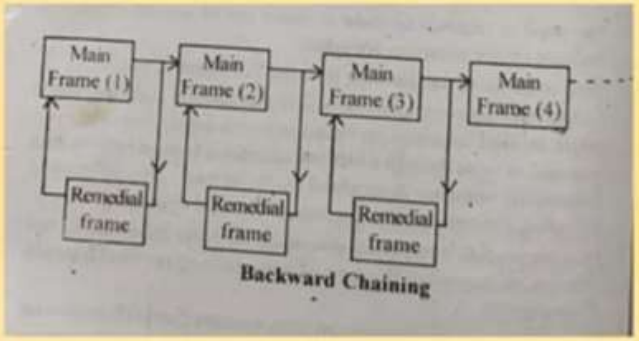
- Disciplinary programming or in one or two paragraphs on the page is a frame.
- It is much larger than the linear programming. Students seriatim go through all the frames. After the frame, the corresponding multi-objective is to answer questions. One of the responses has to choose the correct answer. If the answer is correct, then it proceeds but the answer is not correct, then it is given remedial instruction. The specifically designed for therapeutic or her original part series is directed towards and later again come to the office and are asked to answer. This action, which lasts as long as the student does not give the right answer. The only correct answer to moving on to the next step only to get called.


Main Path
a
b
1
a
b
2
a
b
3
c
d
4
Main Path
1
2
3
4
c
d
b
a
Rigreshn Line
Leads to the Frame
2

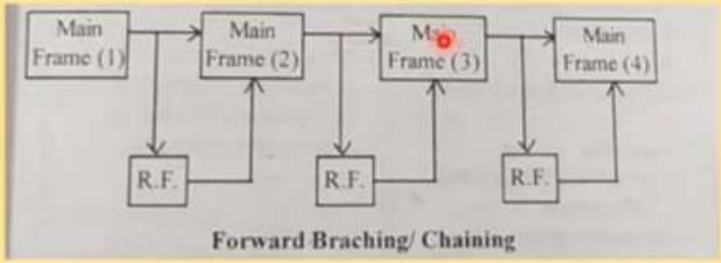
2. Branching programming / Intrinsic programming



Backward Chaining



Forward Chaining



- This type of programming is called branched programming because the linear programming like the student to proceed to a second term in offi ce following the same path, but they—based on their answers individually adopting paths to reach the fi nal position. It does not happen all the posts to present a certain order

Characteristics of Branching Programming

- Branching programming than linear programming compared to each text frame comes more teaching materials.
- Needs of students at various positions have the freedom to reach the fi nal position.
- Programming it is controlled by the students.
- It serves to give home nutrition instantly.
- The share of students in programming multi-choice questions are given.
- This programming based on student's potential errors that emphasizes teaching materials.
- Incorrect response, the student is given the opportunity to correct it. He then reaches to the next step until he could not answer his fi rst major post.
- Each frame has to make it very clear and big.

- The agency plays an important role in the development of student's reasoning power.
- The student - centered agency.
- The agency is based on traditional tutorial method.
- This initiative remains equal interest in learning the subject.
- These mistakes could not impede the learning process because it assumes that the initiatives it has learned from the mistakes and the mistakes to fi x the system is organized.
- By initiatives such materials, books and teaching - machines both are useful.
- The differentiation potential of initiative, creativity and problem - solution is helpful in the development of qualifications.

Limitations of Branching Programming

- 1. An annual or amendments require certain intervals.
- 2. It is more useful for higher classes.
- 3. The whole subject matter is difficult to contain.
- 4. It is relatively expensive initiatives.
- 5. The initiative for the creation of skilled and trained and qualified teachers are required.
- 6. This multi-choice questions several times to the student without the subject matter or read without understanding, estimated on the basis of the answers they give.

Programmed Instruction: Mathetics Programming

Kuldeep Chauhan

Introduction

- **Thomas. F. Gilbert** is credited with developing mathetics programming. Mathetics of the Greek word '**Mathyn**' derives from the word meaning– **learn.**
- **"Mathetics is defined as a systematic application of reinforcement theory to the analysis and construction of complex repertoires which represent the mastery in subject matter".**

- Although it is a bit complicated nature programming skills difficult to achieve, bring about the desired behavior and the subject matter is considered viable in the absolute right to earn.

- Mathetics programming unit of the initiatives 'post' and not 'practice' is. The text-as a link object is placed in the last position is presented as the first post. **Retrogressive Chaining**

- **Conditions of Mathetics**
- Mathetics was initially used in mathematics but also in other disciplines can be used. This initiative has three positions

- **1. Demonstration**
- **2. Prompting**
- **3. Release**

Learning performance of students-behavior is displayed. Prompt the state to generate learning behavior are provided. Immunity learning curve behavior, which are designed for learning, their practice opportunities are provided. Prompt are not used in the third stage. Mathetics building is difficult, for it must be merit in successive advance. Learned the subject starting from the last post, the fi rst post is a little diffi cult to reach normal student.

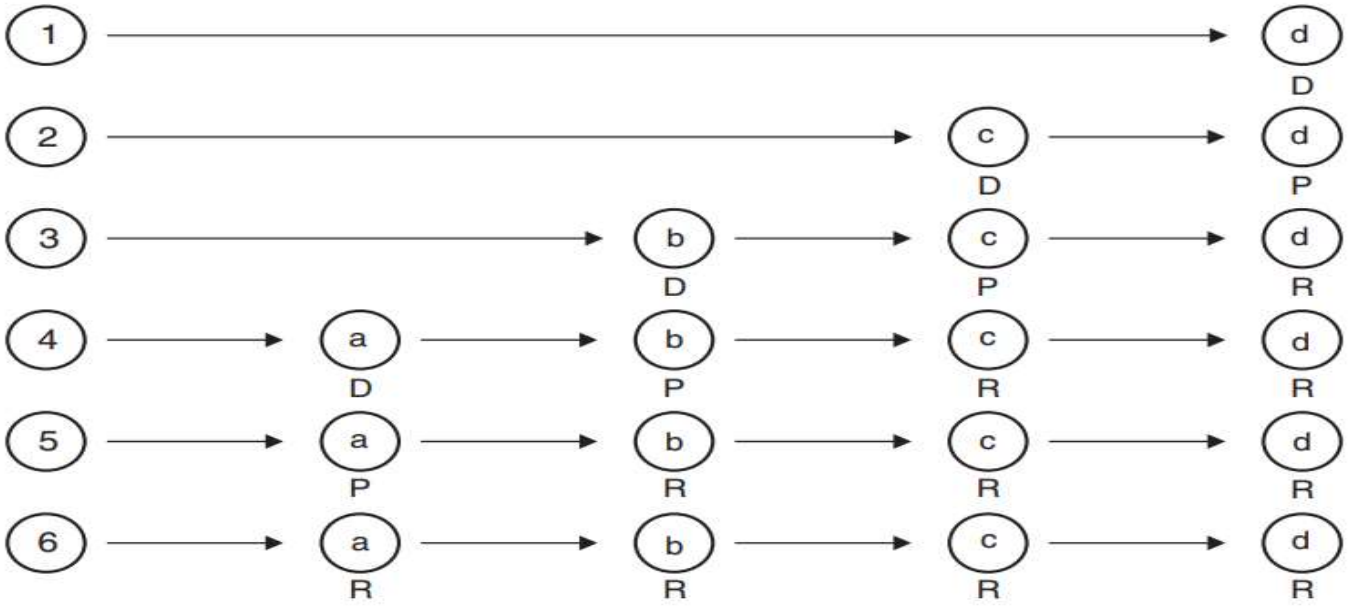
Characteristics of Mathetics and Related Work-System

- (1) Like other instructional format Mathetics programming teaching-learning is derived from a detailed analysis of the material.
- (2) The unit frame rather than the practice or learning diffi culties.
- (3) Practice or to fi nd a solution to this problem provides students Reinforcement.
- (4) The descending chain theory is used.

Work of Mathetics Programme

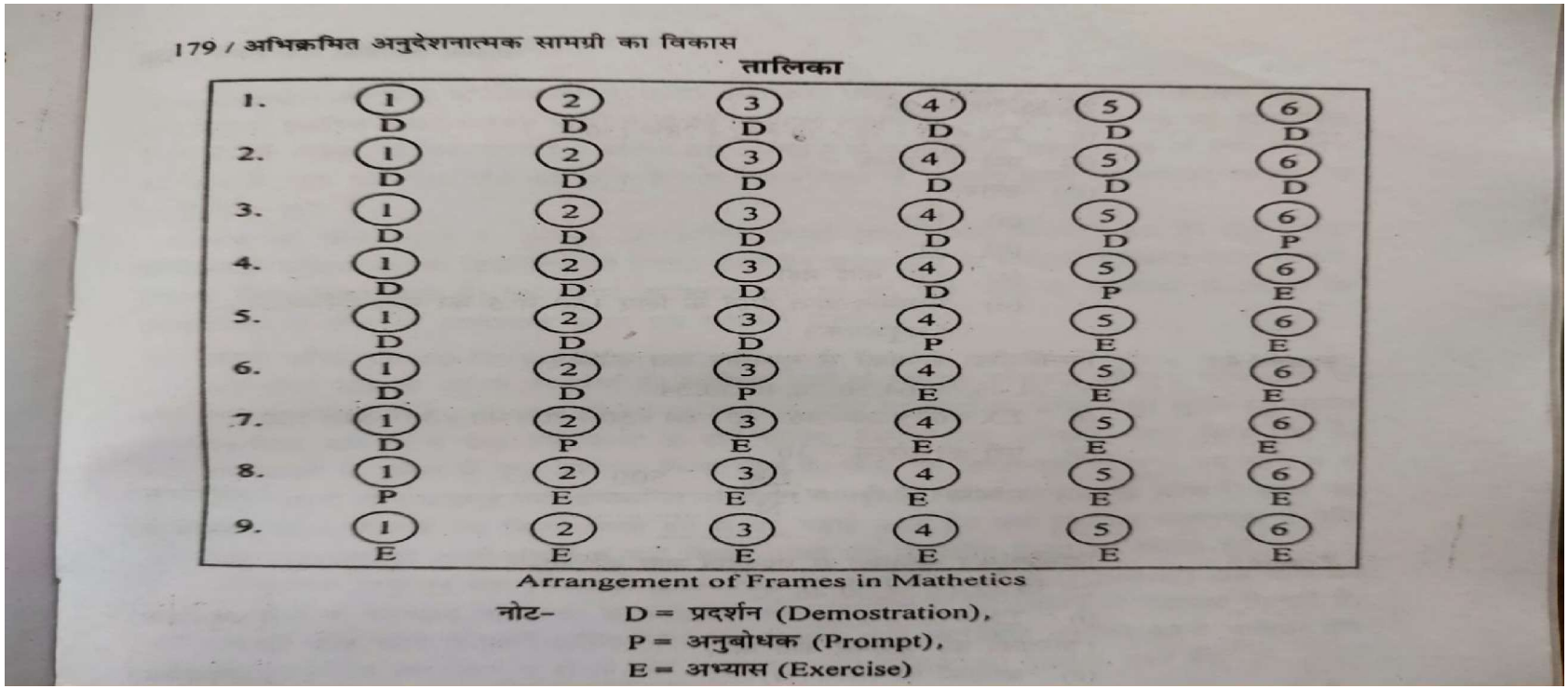
- Mathetics programme on the basis of the above process can be expressed as follows—
- (1) The fi rst is to seek the post of expertise. The post office as often happens in the lastes series.
- (2) Then the programmer to master all the job offers to the students and students expertise required to
- post with your prompt response provides skills so that they can reach the final stage.
- (3) Before reaching the final rank of expertise, all other positions are placed in front of students. Students
- are given prompt, they are responding to them are called to practice dexterity post.

- (4) The ultimate dexterity in front of students from the post offi ce before the term pre to leading positions Notes is presented.
- (5) Keep the student response. At the end of the fi rst term response is required. Thus gradually master is walking on the wrong side. It can be displayed as follows:



Here–D = Performed and display by students, P = Prompter, R = Immunity for response.

- (4) The ultimate dexterity in front of students from the post offi ce before the term pre to leading positions Notes is presented.
- (5) Keep the student response. At the end of the fi rst term response is required. Thus gradually master is walking on the wrong side. It can be displayed as follows:



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तालिका

1.	1 D	2 D	3 D	4 D	5 D	6 D
2.	1 D	2 D	3 D	4 D	5 D	6 D
3.	1 D	2 D	3 D	4 D	5 D	6 P
4.	1 D	2 D	3 D	4 D	5 P	6 E
5.	1 D	2 D	3 D	4 P	5 E	6 E
6.	1 D	2 D	3 P	4 E	5 E	6 E
7.	1 D	2 P	3 E	4 E	5 E	6 E
8.	1 P	2 E	3 E	4 E	5 E	6 E
9.	1 E	2 E	3 E	4 E	5 E	6 E

Arrangement of Frames in Mathetics

नोट– D = प्रदर्शन (Demostration),
P = अनुबोधक (Prompt),
E = अभ्यास (Exercise)

प्रकार के अनुदेशन के रूप को एक उदाहरण से अधिक स्पष्ट रूप में समझा जा सकता है

उदाहरण—मैथेटिक्स का पैकेज

(1) अंक 5 समाप्त होने वाली दो अंकों की संख्या का वर्ग ज्ञात करना—
(अ) संख्या के पहले अंक को उससे अगले अंक से गुणा कीजिए।
(ब) इस गुणनफल के दाहिनी ओर 25 दीजिए।
(स) किसी अनुक्रिया की आवश्यकता नहीं है।

(2) संख्या 25 का वर्ग ज्ञात करना—
(अ) संख्या के पहले अंक (2) को इससे अगले अंक (3) से गुणा कीजिए।
(ब) गुणनफल 6 के दाहिनी ओर 25 लिख दीजिए।
(स) संख्या 25 का वर्ग 625 है।
किसी अनुक्रिया की आवश्यकता नहीं है।

(3) संख्या 35 का वर्ग ज्ञात करना—
(अ) संख्या के पहले अंक (3) को उससे अगले अंक (4) से गुणा कीजिए।
(ब) गुणनफल 12 के दाहिनी ओर 25 लिख दीजिए।
(स) संख्या 35 का वर्ग ..... है।
अनुक्रिया : (स) वर्ग 1235

(4) 65 का वर्ग ज्ञात करना है—
(अ) संख्या के पहले अंक (6) को उससे अगले अंक (7) से गुणा कीजिए।
(ब) गुणनफल ..... के दाहिनी ओर ..... लिख दीजिए।
(स) संख्या 65 का वर्ग ..... है।

अनुक्रिया : (ब) $6 \times 7 = 42$ दाहिनी ओर 25 को लिख दीजिए।
(स) संख्या 65 का वर्ग 4225 है।

(5) संख्या 45 का वर्ग ज्ञात करना है—
(अ) संख्या के पहले अंक को इससे अगले अंक से गुणा कीजिए।
(ब) गुणनफल ..... के दाहिनी ओर ..... लिख दीजिए।
(स) संख्या 45 का वर्ग ..... है।

अनुक्रिया : (अ) संख्या 4 का 5 से गुणा।
(ब) गुणनफल 20 के दाहिनी ओर 25।
(स) संख्या 45 का वर्ग 2025 है।

(6) निम्नांकित संख्याओं का वर्ग क्या है?
(अ) संख्या 75 = ...।
(ब) संख्या 86 = ...।

अनुक्रियाएँ : (अ) 5625 (ब) 7225।

Limitations of Mathetics Programming

Mathetics boundaries of initiatives is being given below—

- (1) Mathetics initiatives to build **complex and difficult**. Adequate skills and **specific training is required** for this.
- (2) **All kinds of topics** related to the subject matter is **not useful** in this area. Its usefulness, **mathematics, physics and psychology skills** have been found to achieve more impressive.
- (4) **Normal or slow intelligence** for students than it has not proved viable.
- (5) Built in the style of these initiatives are more costly because illustrations, paintings and drawings, etc. are used more.
- (6) It is suitable for all types of style is not the achievement of learning objectives.

A Comparison of Different Types of Programming

Material	Linear	Branching	Mathetics
1. Exponent	B.F. Skinner 1954	Normen A. Kroder 1954	Thomas F. Gilbert 1962
2. The original source of	Psychological laboratory analysis or use in pigeons.	Semi-industrial position work instructions to improve performance. It is caused by human training.	This field is generated from Mathetics. Complex math problems are solved through retrogressive series.
3. Learning theory	Oprent conditioning is based on the theory of learning. (R. S.)	The configuration is based on the principle of learning. This is a problem-solving approach. The motivation of the learner-centered approach.	It is based on the principle of learning conectionnist. This chaining-changing approach.
4. Theory	It is based on five basic principles: 1. Small-steps theory. 2. Active-response theory. 3. Immediately-confirmation of theories. 4. Self-**pacing** principle. 5. Students test theories. In addition, optional or mandatory theory may be, too. Three essential principles: 1. Purpose specification principle. 2. Empirical theory. 3. Self-**pacing** principle.	It is based on three basic principles: 1. The principle of the exhibition. 2. The principle of diagnosis. 3. Remidiasn principle.	It is based on three basic principles: 1. Chaining principle. 2. The principle of discrimination. 3. The principle of normalization.

5. Forecast	1. Students can learn better if the material is presented in small units. 2. If the response is immediately improved learning outcomes for students are good. 3. Errors hinder student learning. 4. In Laisej ferric environment students learn better.	1. All conditions/material to be exposed to the students could learn better. 2. Students help diagnose errors. 3. Students learn better if Remidiasn is provided together. 4. Students learn better in a democratic environment.	1. Changing chaining, helps to learn how to reach mastery. 2. As part of the reverse chaining of stimuli for example, the simple complicated. 3. Provides motivation to students upon completion of work.
6. Frame Size	1. Small steps. 2. Element contains only one subject at a time. Each step is complete in itself. It can be taught independently and can be measured.	1. Large frame or steps. 2. Paragraph or page to be in the frame.	1. Small steps but in reverse chaining, complex materials, for example, small, simple units to achieve mastery level.
7. Frame structure	Stimulus-response reinforcement.	Remidiasen exhibition diagnosis.	Performance issues quickly.
8. Types of frame	Three types of frames: 1. Introductory frame 2. Teaching frame or full frame soon. 3. Test frame or enclosed/ unprompted frame.	Two types of frame: 1. Home for teaching and diagnosis. 2. Remidiasn the wrong page.	Two types of frame: 1. Display frame. 2. Fixed frame

9. Reaction	1. Recall or recognition of structured feedback.. 2. These reactions are controlled by the programmer and not by learners.	1. Response is not rigidly structured. 2. Responses are selected by learners, not by programmers.	1. Structured responses. 2. Responses determined by the programmer.
10. Strengthening	1. Strengthening and provides immediate confirmation of correct responses. 2. Incorrect responses are ignored.	1. Strengthening responses confirm the offer. 2. Incorrect responses that help learners in the diagnosis of osteoporosis. 3. Diagnosis is based on the measure of weakness.	1. Strengthening of completion of work provides. 2. Incorrect responses are ignored.
11. Mistakes	Hinder in learning.	Learning helps in the diagnosis of osteoporosis.	No discrimination but also helps in learning.
12. Error rate	Less than ten percent of the benchmark program is acceptable, but it is not far.	More than twenty percent error rate can be accepted.	Low error rate is acceptable.
13. Individual Differences	Only to work at their own pace. For example, the time factor for individual differences.	Choose their own path according to their needs and expectations.	Learners to work at their own pace, but not requirements.

	differences.		
14. As Programme	1. Traditional manual. 2. Contains instructions regarding the use of the programme. 3. Introduction of the subject material. 4. Presentation of smaller material units.	1. Skremveld manual. 2. Initially insert instructions. 3. Back Content was submitted or pages. 4. This is not a back sequence.	1. Traditional manual. 2. Is inserted at the beginning. 3. Material is presented in small units. 4. The units are arranged in series linear retrogressive.
15. Teaching Machine	Machine Teaching Model is very simple and cheap.	Teaching is hard to use the machine. Requires a complex model of the machine.	Linear model of teaching machine.
16. Purpose	1. Modification of the behavior of learners. 2. To encourage self-learning requires a teacher. 3. Students in the program flow induced continuous encouragement.	1. Out the weak points of learners. 2. Provide measures to correct weaknesses.	1. Development of content. Main focus on math and grammar.
17. Use	1. Are used for secondary level students. 2. Learning objectives to achieve lower recall and recognition exclusively for use. 3. Average and below average intelligence useful for students. 4. Remote-can be used in education programs.	1. As useful for secondary and higher classes. 2. Higher objectives can be achieved in various discrimination. 3. Useful for students with average and high intelligence. 4. The remote-can be used in education programs.	1. Useful for higher classes. 2. Useful for complex and difficult task. 3. Useful for the development of math and grammar concepts. 4. The remote-can be used in education

18. Limitations	1. There is no freedom for the student to respond. 2. Which is based on the principle of learning by experiments conducted on animals have been prepared. Animal is more intelligent than humans. Animals than he found an intelligent brain..	1. The learning process does not consider whether or not to place learning. The main weaknesses of learners to diagnose and remedy focuses on providing. 2. There is no indexing pages. Student finds it difficult to follow the steps. 3. Each learner follows the same path, so students-to deceive each other.	1. The main emphasis on content rather than changes in the behavior of the learner. 2. Main emphasis on learning rather than mastery of material changes in behavior. 3. Retrogressive development of learning packages is very difficult to upgrade. She finds it exciting or motivating, so he does not want to go through these pages. 4. Remidiasn rather more emphasis on teaching. So it is only a tutorial approach.

Blended learning

- **Blended learning** in educational research refers to a **mixing of different learning environments.**
- Blended learning is a type of learning that **combines traditional classroom instruction with online or digital learning.**
- It combines traditional face-to-face classroom methods with more modern **computer-mediated activities**.
- Blended Learning is a form of instruction that incorporates both traditional face-to-face instructions with web-based **multimedia** instruction.
- Blended learning can take many different forms, and can be tailored to meet the specific needs of individual students and teachers.

- Here are some examples of how blended learning can be implemented:

1. **Flipped classroom:** In a flipped classroom, students **are assigned online lessons or videos to watch before coming to class**, allowing the teacher to spend more time on interactive activities and discussions during class time.
2. **Rotation model:** In a rotation model, students rotate between different stations, including in-person instruction **with the teacher, independent work, and online learning.**
3. **Flex model:** In a flex model, students have **more control over the pace and timing** of their learning, and **can choose to complete some or all of their learning online**.
4. **Enriched virtual model:** In an enriched virtual model, **students attend class in-person a few times a week,** and complete the rest of their learning online.

- Blended learning can offer several benefits, including:

1. **Flexibility:** Blended learning allows students to learn at their own pace and on their own schedule, which can be particularly helpful for students who may have other commitments or challenges that make traditional classroom learning difficult.
2. **Personalized learning:** Blended learning allows for personalized instruction and tailored learning experiences, as teachers can use online tools and data to track student progress and provide targeted feedback and support.
3. **Enhanced engagement:** Blended learning can make learning more engaging and interactive, as students can participate in online discussions and collaborative activities, and use multimedia resources to explore complex concepts.
4. **Improved outcomes:** Research has shown that blended learning can lead to improved learning outcomes, including higher test scores and better retention of material.

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Thank you…