UNIT –II: Teaching Technology

b) Micro Teaching: Concept, Procedure, Merits and Limitations, Skills of Micro Teaching (Introduction, Questioning, Explanation, Reinforcement, Stimulus Variation).

MICRO TEACHING AND SKILLS OF MICRO TEACHING

Meaning of Micro Teaching

Micro Teaching is a procedure in which a **student-teacher or trainee teacher practices teaching** with a reduced number of students in a reduced period of time with an emphasis on a narrow and specific teaching skill.

Definition of Micro Teaching

There are many definitions of microteaching given by scholars. Some of the micro-teaching definitions are:

D.W Allen (1996): According to D.W Allen *"Microteaching is a scaled-down teaching encounter in class size and time".*

R.N bush (1968): *"Micro Teaching is a teacher education technique which allows the teachers to apply clearly defined teaching skills to carefully prepared lessons in a planned series of five to ten minutes to encounter with real students, often with an opportunity to observe the result on Video Tape."*

L.C Singh(1977): *Microteaching is a scaled-down teaching encounter in which a teacher, a small unit to a group of 5 students for a small period of 5 to 20 minutes. Such a situation offers a helpful setting for an experienced or unexperienced teacher to acquire new teaching skills and to refine old ones.*

What are the Objectives of Micro Teaching?

Some of the Aims and Objectives of Microteaching are:

- To enable teacher trainees to learn and **assimilate new teaching skills** under controlled conditions.

- The second objective is to enable teacher trainees to **master a number of teaching skills**.
- The last one is to enable teacher trainees to **gain confidence** in teaching.

Characteristics and Features of Micro Teaching

The main characteristics of microteaching are:

1. It is a **highly individualized training device** and an experiment in the field of teacher education which has been incorporated in the practice of teaching schedule.
2. The students are providing **immediate feedback** in terms of peer group feedback, tape recorder, or CCTV.
3. Micro teaching is a student teaching skill training technique and not a teaching technique or method.
4. Practice one skill at a time.
5. Reducing the class size to 5 to 10 pupils or students.
6. **Limiting the content** to a single concept.
7. Microteaching is micro in the sense that it scales down the complexities of real teaching.
8. Micro teaching advocates the choice and practice of one skill at a time.

Steps of Micro Teaching

The microteaching program involves the following 9 Steps:

- Step 1: Orientation
- Step 2: Discussion of Teaching Skill
- Step 3: Selection of a particular teaching skill
- Step 4: The practice of the Skill
- Step 5: Proving the feedback
- Step 6: Re-Planning
- Step 7: Re-teaching
- Step 8: Re-feedback
- Step 9: Repetition of the micro-teaching cycle

Step 1: Orientation

In this step particular skill to be practiced is explained to the teacher trainees in terms of the purpose and components of the skill with suitable examples. At the beginning the student teachers should be given the necessary theoretical background about micro teaching by having a free and fair discussion of aspects like those given below:

- Concept of micro-teaching
- significance of using microteaching
- The procedure of micro teaching
- Requirements and Strategies for Adopting micro-teaching techniques

Step 2: Discussion of Teaching Skill

In this step, the teacher trainee gives the **demonstration** of the skill of micro teaching in simulated conditions to the teacher trainees. In this step, the knowledge and understanding of the following aspects are to be developed.

- Analysis of teaching into component teaching skills.
- The discussion of the rationale and role of these teaching skills in teaching.
- Discussion about the component teaching behaviors comprising various teaching skills.

Step 3: Selection of a particular teaching skill

In this step, the teacher trainee **plans a short lesson plan** on the basis of the demonstrated skill for his or her practice. They are also provided with necessary orientation and processing material for the practice of that skill.

Step 4: The practice of the Skill

In this step, the trainee teachers **teach the lesson to a small group of students**.

His / Her Lesson is supervised by the supervisor and peers where possible. The student-teacher may also have his lesson taped on a video or audiotape.

Step 5: Proving the feedback

On the basis of the observation of a lesson, the supervisor gives feedback to a teacher trainee. The **supervisor reinforces** the instances of effective use of the skill and draws the attention of the teacher trainee to the various points where he could not do well. Whenever possible the help may also be taken from the various gadgets like audiotapes, videotapes, and closed-circuit televisions.

Step 6: Re-Planning

After getting the feedback given by the supervisor the teacher trainee re-plans the lesson plan in order to use the skill in a more effective manner in the second trail.

Step 7: Re-teaching

In this step, the revised lesson is taught to another comparable group of students. In this session of 6 minutes, the student-teacher re-teaches his micro lesson on the basis of his prepared plan or rearranged setting.

Step 8: Re-feedback

In this, the supervisor observes the re-teach lesson and gives re-feedback to the teacher trainee with convincing arguments and reasons.

Step 9: Repetition of the microteaching cycle

This is the last step of micro-teaching in which the **"teach-re-teach" cycle** may be repeated several times till adequate mastery level is achieved by the trainee.

Micro Teaching Skills

There are a number of microteaching skills. Major types of Micro teaching

skills are:

1. Skill of Introducing a Lesson
2. Skill of Probing Questions
3. Skill of Explanation
4. Skill of Stimulus Variation
5. Skill of Reinforcement
6. Skill of Illustration with Examples
7. Skill of Blackboard writing
8. Skill of Achieving closure

Micro Teaching Skill of Introduction

A good introduction of the lesson is a skill, an art, which will engage students, tell them what to expect from the lesson, and provide a framework with each student can work. During the course of introducing, the teacher must not forget that the introduction of the lesson to the students is a good way to b sure that students understand what the lesson will be about.

The Skill of Introducing a lesson involves the **maximum use of the previous knowledge** of the students, **using the appropriate device** while introducing a lesson, avoiding discontinuity, and **avoiding irrelevant statements**.

The major Components or Elements of Introduction Skill of Microteaching are:

- Maximum Utilization of Previous knowledge of the students.
- Using Appropriate Device
- Maintenance of continuity.
- Relevancy of verbal or non-verbal behavior.

Observation Schedule Cum Rating Scale Of the Skill of Introducing Lesson Plan Format

Name of the Trainee Teacher:	**Date:**
Subject:	**Roll No:**
Concept/Topic:	**Class:**

Session: **Supervisor:**	**Duration:**
Trainee Teacher's Activity	**Students' Activity**

Tallies Showing occurrence of component behavior	
Components	**Rating Scale**
Desirable Behavior	
Using Previous experience of the pupil	0 1 2 3 4 5 6
Proper use of the device; technique	0 1 2 3 4 5 6
The overall impression of introducing a lesson	0 1 2 3 4 5 6
Undesirable Behavior	
Lack of continuity	0 1 2 3 4 5 6
Irrelevant verbal or non-verbal behavior	0 1 2 3 4 5 6

- Lesson Plan Examples for Skill of Introducing a Lesson
- Sample Lesson Plans on Microteaching Skill of Introducing Lesson for B.Ed, DE.L.Ed,BTC and School Teachers

MicroTeaching Skill of Questioning

The success of teaching or art with which we put questions very must depend upon the micro-teaching skill of questioning, so the while fabric of the classroom

teaching-learning process is being weaved around the activities associated with the **use of questioning** skills on the part of teaching.

According to Parker *"Questioning is the key to all educative activity."*

Thring's View: "Teaching means skillful questioning to force the mind to see, to arrange, to act."

So in Simple words, questioning skill can be defined as a teaching skill which is helpful in putting the desired, meaningful, clear, relevant, precise, specific, grammatically correct, simple and straight forward questions to the students in a classroom teaching-learning situation for the purpose of testing their knowledge and understanding.

What is The Purpose and Functions of Questioning Skill of Micro Teaching?

Prof. Frank A. Butter emphasizes the following purpose of questions.

1. To Change Viewpoints
2. To bring out cause and effect
3. To develop new ideas
4. To promote understanding
5. To develop an appreciation
6. To create a mindset
7. To test the objective thoughts
8. To apply information

What are the Types of Questions that should be asked in the teaching-learning process to make it more effective?

- Natural Questions
- Formal Questions
- Introductory or Preliminary Questions
- Re-capitulatory Questions
- Higher-Order Questions

How to Ask Questions?

1. Address questions to the whole class.
2. Distribute questions over the whole class.
3. Allow sufficient time to think
4. Do not repeat questions
5. Occasionally ask questions to back-benchers.
6. Aks questions in such a manner as not to suggest the answer
7. Show adaptability in questioning
8. Audible to all.
9. Be cheerful and jovial
10. Avoid elliptical as well as echo and double-barrelled questions

----> The teacher must be sure that he/she may have a clear purpose for their question rather than just determining what knowledge is known. This type of question planning results in designing questions that can expand students the knowledge and encourage them to think creatively.

- Skill of Questioning Examples
- Sample Lesson Plans on Microteaching Skill of Questioning Lesson for B.Ed, DE.L.Ed, BTC and School Teachers

Micro Teaching Skill of Illustration With Examples

The micro-teaching skill of Illustration with example **provides a sense of authority** to the teacher. At a given time, when the teacher inspires that the student in the classroom grasps the content of the lesson quickly, the skill requires that the **teacher uses a personal and specific example to illustrate the content of the topic**.

Illustrate the subject matter with the help of an example is necessary to clarify, verify, or substantiate the concept. Proper use of this teaching skill can enrich the communication skill of the teacher as well as that of the student and make the study memorable.

Significance and Importance of Illustration Skill

- With the help of this skill, the teacher becomes enabled to command and to have the **attention** of the pupils with remarkable effectiveness.
- Besides, this skill can stir up emotion and thus may reach the conscience and the heart of the student. The skill; is also an effective memory aid and thus it must be used by every teacher for **result-oriented** teaching.
- Illustration combined with example usually requires only a few words, yet they can paint vivid mental images and if chosen carefully and used skillfully they can prove out to be very **fruitful**. However, a teacher may reinforce their value by adding a brief explanation.
- This specific skill may include numerous illustrations and examples drawn from **practical experience** by the teacher which can be used in the teaching.
- The Illustration with Example Skill of Micro Teaching is so essential in the context of the topic that sometimes the illustration themselves can explain the content of the topic concerned.
- Illustration along with the example, if they are quite accurate and appropriate to the content of the topic concerned as well as **pleasing to the eyes**, then they would serve the purpose of the teacher in a rewarding manner.
- The picture must support the text. The less the number of words, the more the illustration must convey.
- Understanding how illustration shows visual elements such as line, color, shape, texture, and composition can help to appreciate and understand the artists; intention though the artwork. The student would also be to identify illustration; style such as **realistic**, impressionistic, expressionistic, abstract, primitive, and surrealistic.
- Early exposure to the illustration along with related examples helps to develop the **aesthetic sensitivities** amongst the students.

General Guidelines for the Effective Use of the Micro Skill of Illustrations

The following guidelines may be used by the teacher for effectively using the skill of illustration with example in micro-teaching.

1. Start with the simplest Example
2. Illustration and Example withing a comprehensive level of student

3. Non-Relevant Illustration and Example Also
4. Limited Number of Illustrations
5. The illustration is for Clarification of an idea
6. Asking the students to provide some more example

1. Start with the simplest Example:

The teacher should start teaching with the use of simple illustration along with the example and move on to the complex ones in an ascending manner. A basic principle of concept formation is that an example given to illustrate a concept confronts the learner with a complex sorting task.

Some of the information conveyed by the illustration / Example may be quite relevant whereas it may be somewhat irrelevant also. If the teacher being with complex illustrations, the student may become confused by excess information and miss the point. Therefore, the teacher must be with a simple example and work up to complex ones, emphasizing only the relevant aspect of the subject matter.

2. Illustration and Example within a comprehensive level of student:

If the illustration and the example are not within the range of the student's experience and knowledge i.e. within their comprehensive level, then they are useless as an illustration of the concept. But the question arises as to how to know that an illustration or an example is appropriate for the students.

This information is a function of the teacher's familiarity with the student's background. The more a teacher knows about the students, the more the teacher would be able to select relevant illustrations and examples.

3. Non-Relevant Illustration and Example Also:

After presenting some illustration and example, the teacher should use one irrelevant or not so relevant illustration along with the example in order to sharpen the student's understanding. That would mean once the student has acquired a basic understanding of the concept, then the sue of one such irrelevant or not so relevant to the concept illustration/example would help the student to discriminate between the concept actually being taught than that of some other concept. However, care should be taken not to include irrelevant illustrations or examples too early in the presentation; otherwise, the student may get confused unless they have fully

grasped the content of the topic concerned.

4. Limited Number of Illustrations:

The teacher should keep into consideration that giving a number of illustrations would not prived the student with a better chance of comprehending the contents. Therefore, unless the additional example illustrates a new aspect of the concept, or provides more information about it, they are not going to add anything extra to the students' understanding; rather they may confuse the students.

5. The illustration is for Clarification of an idea:

The teacher must always take into consideration that the actual purpose of using an example is to illustrate, clarify, or substantiate and idea. Therefore the teacher must relate the example to the idea should not assume that the student would automatically connect the example they are given with an idea.

6. Asking the students to provide some more example:

There is one way through the use of which the class teacher and the aid way is to ask the student to provide some additional examples pertaining to the subject taught. If their example is good, then that ensures that the student has grasped the concept properly. If their example is faulty, they have probably misunderstood, and then the teacher can pinpoint their misconception about the lesson.

How can the Microteaching Skill of Illustration prove out to be fruitful for the class teacher in the classroom?

The specific skill of illustrating with an example can prove out to be fruitful for the class teacher in the following ways:

1. Attracting Attention
2. Aiding Retention
3. Aiding Retention
4. Boosting Comprehension
5. Creating Context

1. Attracting Attention: Showing a photograph of a dramatically beautiful rainbow at the opening of a presentation on the topic of light proves out more

helpful in attracting the attention of the student than explaining the contents.

2. Aiding Retention: Providing a chart showing the color of VIBGYOR organized according to the color classification would naturally prove out to be fruitful to the teacher and might be viewed as primarily aiding retention.

3. Boosting Comprehension: Drawing a diagram illustrating the seven colors of the rainbow in their natural order will naturally help the teachers in explaining the process for boosting up the comprehension level of the students.

4. Creating Context: When the student is given the opportunity to visualize the photograph, chart of VIBGYOR, diagram of seven colors, and draw their own conclusion in terms of their understanding, which may lead to the creation of the context.

Conclusion: In a nutshell, it can be said that the appropriate use of the micro teaching skill of illustration with example is such a fruitful teaching aid that can enrich the communication skills of the teacher, touch the heart of the student, and make the topic taught quite memorable. On the other hand, if this skill or methodology is handled improperly. it may divert the attention of the student from the valuable instruction. Nonetheless, it is quite a useful, helpful, and rich dividend-paying skill.

Micro Teaching Skill of Explanation

We have been using explanation as an intellectual activity. Concepts, ideas, or phenomena are communicated to make them understandable to others by giving examples showing relationships, etc. Explaining is an activity which shows the relationship among various concept, ideas, event, or phenomenon.

The attempt is made to relate a set of facts with another set of facts to promote understanding. A teacher has to learn the skill of explaining in order to make the students understand clearly many ideas, concepts, and principles that need explanation. At teacher who can explain things well will go a long way in making his lesson effective.

Meaning of Explanation in Behavioural Terms:

A teacher is said to be explaining when he is describing how, why, and sometimes what of a concept, principle, phenomenon, event, action, or condition.

The micro teaching skill of explaining is defined as an act of bringing about an understanding in someone about a concept, a principle, or a phenomenon.

It has been regarded as a set of **interrelated statements** made by the teacher in order to increase the understanding of the students about ideas, concepts, and phenomena. While explaining, cause for the phenomenon; reason behind the action, and various logical steps involved in arriving at inferences are given in interrelated selected logical steps involved in arriving at inferences are given in the interrelated selected statement.

The Two Main Aspects of Explanaing Are:

1. Selection of Appropriate Statement
2. Interrelating and Using the Selected Statements

1. Selection of Appropriate Statement: According to the level of the students i.e age, maturity, previous knowledge, and content of the concept, principle, or phenomenon.

2. Interrelating and Using the Selected Statements: For the proper understanding of the concept, principle, or phenomenon.

Generally, there are 3 types of statements:

1. Descriptive Statements
2. Interpretive Statement
3. Reason giving Statements

A good explanation is one that is understood by the students. To make an explanation effective, the teacher has to increase the occurrence of desirable behavior and avoid the use of undesirable behavior.

Components of Explanation Skill of MicroTeaching

Explanation skill has **12 Behavioural components** which can be **divided into desirable and undesirable categories.**

A. Desirable Behaviour

1. Explaining Links
2. Introductory Statement
3. Concluding Statement
4. Use of VIsual TEchniwque
5. Technical Words defined
6. Interesting of Students
7. Covering Essential points
8. Testing students understanding

B. Undesirable Behaviour

1. Irrelevant Statement
2. Lacking continuity in Statement
3. Lacking in frequency
4. Vague words or phrases

Programmed Instruction Method

Basic Concepts of Programmed -Learning:

Programmed learning is based on certain basic concepts which have been derived from experimental work of Operant Conditioning.

These are as follows:

1. Stimuli & Responses:

A stimulus is that aspect of an environment which guides or controls the behaviour of an individual. It is any condition, event, or change in environment of an individual which produces a changing behaviour. For example, a question is asked by a teacher, is a very familiar stimulus in the class-room teaching.

A response is a part of, or a change in a part of behaviour. The example of a response is the' answer' given by students when faced with a question.

2. The Transfer of Stimulus Control:

When the learner's responses from the stimuli of initial behaviour, get transferred to the appropriate stimuli, this is called transfer of stimulus control.

3. Prompting:

A prompt is a supplementary stimulus added to the another stimulus for facilitating an errorless response.

4. Gradual Progression:

It means step presentation of material in a logical sequence.

5. Reinforcement:

Generalisation means responding to similar elements in different leaning situations. Discrimination is differentiating between two or more stimuli and making an appropriate response.

7. Extinction:

Extinction means weakening of a response. When a response occurs and remains unreinforced, the response does not become firmly connected to the stimuli present

8. Concept Formation:

It is a process of generalization within certain specific limits and discrimination of one stimulus from another within that limit

9. Successive Approximation:

It means approaching the terminal behaviour in a step by step sequence by a cumulative effort on the part of the learner.

10. A frame or a Didule:

It is a unit of subject matter which the learner handles at one time. It has three parts: stimulus (stimule), response (respule) and feed-back (corrule).

11. Operant Span:

It is the number of responses that a student can handle in one frame or didule.

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12. Terminal behaviour:

The behaviour that the student is expected to have acquired at the end of a programme sequence is called terminal behaviour.

Principles of programme- Learning:

The principles of programming imply the rules and systems by which a programme is constructed.

The following principles are considered to be the basic ones for programmed learning:

1. Objective specification:

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Which means identifying the terminal behaviours that the learner will be able to perform when he has completed the programme.

2. Small Step Size:

Which involves dividing the information to be communicated into small units.

3. Overt Responding:

It means that pupils must act on each unit of information by means of exercises provided to assimilate it.

4. Success or Minimal Error:

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This means that error and failure must be avoided at all costs because they are construed as obstacles to learning.

5. Immediate feedback:

In order to ensure success and satisfaction, the pupil must know that his action is correct.

6. Logical, graded progress:

It implies two things-relevance of content and its graded presentation.

7. Self Pacing:

It is used for programme development and validation.

The term educational technology has a wide range of application at present. The examples of educational technology include both hardware and software learning sequences. In the hardware, we find the teaching machines, the computer-assisted instruction, the learner- controlled instruction and the CCTV. The examples of software instructional sequences are programmed learning material either in the book form or in a teaching machine form and various types of self- instructional materials.

Programmed learning is the most appropriate example of the latest concept of instructional technology. It is educational innovation and auto-instructional device. It is not only a technique for effective learning but also a successful mechanism of feedback device for the modification of teacher-behaviour.

Programmed learning has arrived on the educational scene mainly due to the laboratory experiments of Prof B.F Skinner. Prior to Skinner the concept of "Conditioning" as presented by pavlov and Watson and the 'Law of effect' as formulated by Thorndike are the main historical links in the developing chain of important events.

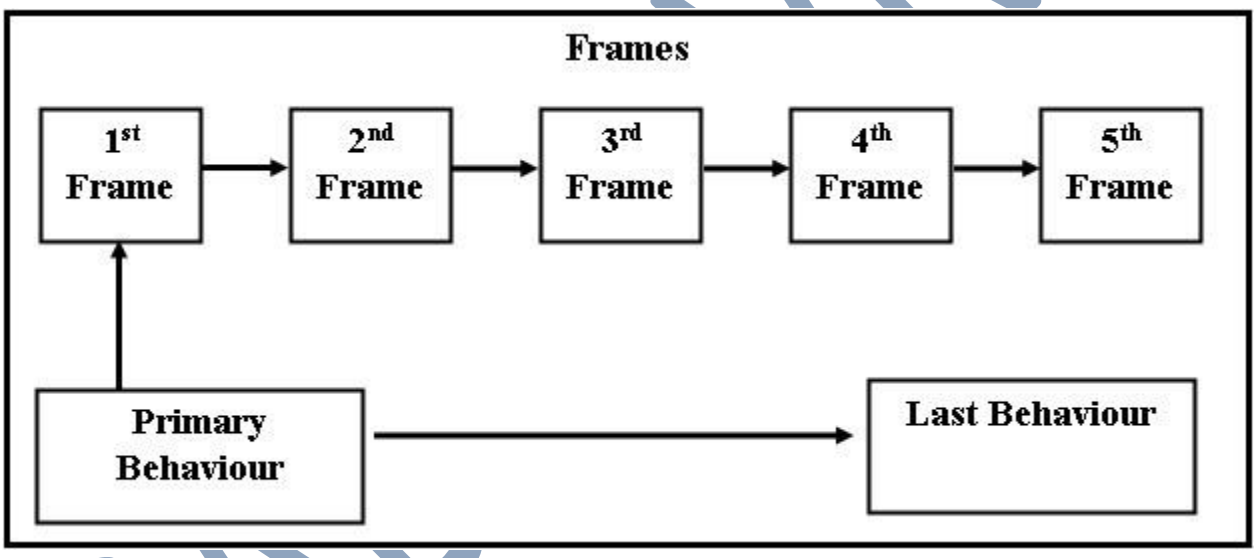
Styles/Types of programming

There are three types of programming.

1. Linear Programming.
2. Branching Programming.
3. Mathetics.

Linear Programming:

The founder of this programming is B.F. Skinner. It is based on theory of operant conditioning. 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.



Linear programming is based on five fundamental principles-

1. Principles of small step.
2. Principle of Active responding.
3. Principle of immediate confirmation.
4. Principle of self pacing.

5. Principle of student testing.

The assumption behind the linear programming is that student learns better if content is presented in small units, student response if immediately confirmed, results in better learning, student's error create hindrance in learning. Student learns better in Laissez fairy environment.

Frame size in small steps; include only one element of topic at a time. Each step is complete in itself. It can be taught independently and can be measured independently. Frame structure is based on stimulus-response-reinforcement. There are four types of frames. Introductory frames, Teaching frame, practice frames and testing frames.

Responses in linear programming are structured responses and are controlled by programmer and not by learners. Immediate confirmation of correct responses provide reinforcement, wrong responses are ignored.

It is used for secondary level students, used for achieving lower objectives of learning especially for recall and recognition, useful for student of average and below average intelligence can be used in distance education programme.

Limitations of Linear programming-

1. No freedom for student to response.
2. Based on learning theories which were formulated by experience conducted on animals. A human being is more intelligent, than animals, he has got an intelligent brain.
3. Every learner has to follow the same path; therefore, student may cheat from one another.

4. Wrong responses are avoided in the programme. No remedy is provided for them.

Branching programming

The founder of Branching programming is Norman A Crowder. It is based on configuration theory of learning. It is a problem solving approach. It is stimulus centered approach of learning. It is based on three basic principles- 1. Principle of Exposition, 2. Principle of Diagnosis, 3. Principle of remediation.

Assumptions behind this programming are-

A. Student learns better if he is exposed to whole situation or content.

B. Student errors help in diagnosis.

C. Student learns better if remediation is provided side by side.

D. Student learns better in democratic environment.

Frame size is large. There may be a Para or page in the frame. Frame structure is Exposition- Diagnosis- Remediation types. There are two types of frames- Home page (for teaching and diagnosis) & Wrong pages (for remediation). Responses not rigidly structured and responses are selected by learner and not by the programmer. Confirmation of correct responses provides reinforcement. Wrong responses also help in diagnosis of weaknesses of the learner. Remedy is provided on the basis of diagnosed weaknesses of the learner. Error helps in diagnosis of the weaknesses of learner. More than 20% error rate can be accepted. The purpose of Branching programming is to draw out weak points of learner and provide remedy

for recovering those weaknesses.

Branching programming is used for secondary as well as higher classes. Higher objectives can be achieved such as multiple discrimination etc. It is useful for students of above average and high intelligence. It can also be used in Distance education programmes.

Limitations of Branching programming

1. It does not consider learning process whether learning is taking place or not. Main emphasis is on diagnosing the weakness of learners and providing remedy to them.
2. There is no sequencing of pages. Student finds it difficult to follow the steps. He does not find it exciting or motivating, therefore he does not want to go through these pages.
3. More emphasis on remediation rather than teaching. Hence, it is only a tutorial approach.

Mathetics Programming

The founder of Mathetics is Thomas F. Gilbert. "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." It is based on connectivist theory of learning. It is a reverse chaining approach. It is based on Principle of chaining, Discrimination and Generalization. Mathetics programming is based on following assumptions.

1. Chaining of responses helps in learning to reach up to mastery level.

2. Reverse chaining of stimuli helps in learning, i.e. from whole to part, from Complex to simple.

3. Completion of task provides motivation to students.

Frames size is organized in small step but in a reverse chain i.e. from complex content to its small, simple units to attain mastery level; Frame structure is based on Demonstration-prompts-release. There are two types of frames- 1. Demonstration frames 2. Prescription frames.

Responses are structured responses and responses determined by the programmer. Completion of task provides reinforcement. Wrong responses are ignored. Error helps in discrimination but not in learning. Its main purpose is to develop mastery of the content. Main focus is on Mathematics and grammar.

It used for higher classes useful for complex and difficult task. It is useful for developing concepts of mathematics and grammar. It can be used in Distance Education.

Limitations of Mathetics programming:

1. Main emphasis is on mastery of the content rather than changes in behavior of the learner.

2. Retrogressive chaining of stimuli if not effective for terminal behavior.

3. It is very difficult to develop retrogressive learning package.

Computer Assisted Instruction (CAI)

A self-learning technique, usually offline/online, involving interaction of the student with programmed instructional materials.

Computer-assisted instruction (CAI) is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning that takes place.

CAI uses a combination of text, graphics, sound and video in enhancing the learning process. The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.

CAI refers to the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation, and problem solving approaches to present topics, and they test the student's understanding.

Typical CAI provides

1. text or multimedia content
2. multiple-choice questions
3. problems
4. immediate feedback
5. notes on incorrect responses
6. summarizes students' performance
7. exercises for practice
8. Worksheets and tests.

Types of Computer Assisted Instruction

1. Drill-and-practice Drill and practice provide opportunities or students to repeatedly practice the skills that have previously been presented and that further practice is necessary for mastery.

2. Tutorial Tutorial activity includes both the presentation of information and its extension into different forms of work, including drill and practice, games and simulation.

3. Games Game software often creates a contest to achieve the highest score and either beat others or beat the computer.

4. Simulation Simulation software can provide an approximation of reality that does not require the expense of real life or its risks.

5. Discovery Discovery approach provides a large database of information specific to a course or content area and challenges the learner to analyze, compare, infer and evaluate based on their explorations of the data.

6. Problem Solving This approach helps children develop specific problem solving skills and strategies.

Advantages of CAI

• one-to-one interaction

• great motivator

• freedom to experiment with different options

• instantaneous response/immediate feedback to the answers elicited

• Self pacing - allow students to proceed at their own pace

• Helps teacher can devote more time to individual students

• Privacy helps the shy and slow learner to learns

• Individual attention

• learn more and more rapidly

• multimedia helps to understand difficult concepts through multi sensory approach

• self directed learning – students can decide when, where, and what to learn

Limitations of CAI

• may feel overwhelmed by the information and resources available

• over use of multimedia may divert the attention from the content

• learning becomes too mechanical

• non availability of good CAI packages

• lack of infrastructure