LOVELY PROFESSIONAL UNIVERSITY

TECHNOLOGY IN TEACHING

Edited By
Dr. Kulwinder Pal

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SYLLABUS

TECHNOLOGY IN TEACHING

Objectives:

- To be aware of the basic concept and significance of educational technology.
- To apply the latest technological innovations in the process of teaching-learning.
- To acquire the skills of handling and managing latest sources of information to enrich the quality of education.

Sr. No.	Description
1	Meaning and Nature of Educational Technology, Approaches to Educational Technology
2	Micro Teaching, Simulated Teaching(Simulation), Flander's Interaction Analysis System, Reciprocal Category System= RCS
3	Models of Teaching, Glasser's Basic Teaching Model, Taba Inductive Thinking Model
4	Advance Organizer Model, Bruner Concept Attainment Model, Richard uchman's Inquiry Training Model
5	Programmed Learning/Instruction, Linear Programming, Branching Programming, Mathetics Programming, Development of Programmed Study

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Unit–1: Meaning and Nature of Educational Technology

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1.9 Review Questions

1.10 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand education.
- Learn the definition of educational technology.
- Understand the assumptions of educational technology.
- Understand the areas of educational technology.

Introduction

'Educational Technology' word is made up of two words—one is '**Education**' and another is '**Technology**'. First we will look at the meaning of education and then technology and based on this, will try to define the subject.

1.1 What is Education?

The meaning of Education in Hindi is **'Shiksha'**. It means—**To educate.** In other words, learning or academic–to achieve through the creation of rituals and practices is called education. Education is synonyms of the Latin word **'Educatum'** which is meant in English 'Education'. It means—**'The art of**

Notes

teaching'. According to Universal Dictionary of English Language, Education means—**(1) To educate, To provide training, (2) Developing brain and character, and (3) A particular state education systems.** These words indicate various learning of education and educational procedures. **By providing new experience, education makes a boy to adjust him according to the environment and the full development of his powers and inherent abilities, as per eligibility, he could contribute his family, community and nation to a specific area.**

Education is meant to bring the desired change in a child's behaviour. Basic trends of child are refined by education. Psychology, technology and science education provide valuable contribution in refining the basic trends. Thus, education in itself is not a self-sufficient suffix but it is related to technical science.

Notes Technical science education helps in the study of the behavior of children and provides instructions to scrap and modification for them.

1.2 What is Technology?

Technology or Technological Science is a synonym of an English word 'Technology'. Technology means—**Methods of using scientific knowledge in daily life.** According to **Prof. Golbraith,** There are two major characteristics of Technology—

(1) Systematic application of scientific or other organized knowledge to practical tasks.

(2) Forming the division and sub-division of any such task into its component parts.

Jacquetta Bloomer defined Technology in 1973 as follows—"Technology is the application of scientific theory to practical ends".

So it can be said that the **scientific mechanisms and experimental techniques as well as technical or technological sciences.**

'Technical' term of 'machine' or machine-related suffixes people usually associate with. But it is not necessary that the 'technical' should only be used in a machine or machinery. **This means that any experimental work, in which scientific knowledge or principles should be used.** It derives from the Greek word **'Technikos'** which means—art. This is the synonym of the Latin language word **'Texere'** which means for weaving or construction. According to **Dr. Das** "Any system of interrelated parts which are organized in a scientific manner as to attain some desired objective could be called technology."

1.3 Definitions and Nature of Educational Technology

1.3.1 Simplistic Definitions

Definitions of educational technology has a variety of different scholars. Some important definitions are being quoted below. These definitions assist in understanding the meaning and nature of educational technology—

(1) **Jacquetta Bloomer 1973**—"Educational Technology is the application of scientific knowledge about learning to practical learning situations."

(2) **Richmand 1970**—"Educational Technology is concerned to provide appropriately designing learning situations, holding in view the objectives of the teaching or training, bring or bear the best means of intruction."

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(3) **Robert A. Cox, 1970**—"Application of scientific process to man's learning conditions called Educational Technology."

(4) **Dececco**—"It is in the form of detailed application of the Psychology of learning to practical teaching problems."

(5) **Robert M. Gagne**—"Educational Technology can be understood as a mean for the development of a set of systematic techniques and accompanying practical knowledge for designing testing and operating schools as educational systems."

(6) **S. S. Kulkarni, 1966**—"Educational Technology may be defined as the application of the laws as well as recent discoveries of science and technology to the process of education."

To comment on the above definitions is evident that all these definitions are unilateral. Some definitions highlight an aspect of educational technology and some definitions highlight a different aspect. Thus, the properties of these definitions is the lack of comprehensiveness.

1.3.2 Acceptable Definitions of Educational Technology

Definitions of Leith, Sakamato and Shiv K. Mitra may be classified in this category –

(1) **G.O.M. Leith**—"Educational Technology is the systematic application of scientific knowledge about teaching learning and conditions of learning to improve the efficiency of teaching and training."

(2) **Takshi Sakamato, 1971**—"Educational Technology is an applied or practical study which aims at maximising educational effect by controlling such relevant facts as educational purposes educational environment, conduct of student, behaviour of instructors and interrelations between students and instructors."

(3) **Shiv K. Mitra**—"Educational Technology can be conceived as a science of techniques and methods by which educational goals could be realized."

1.3.3 Functional Definition of Educational Technology

E. E. Hadden's definition is said to be functional. It includes both the fundamental and practical aspects of educational technology.

Did u know? Educational Technology is that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process.

Based on the above definitions, we arrive at the following conclusions —

1. The basis of educational technology is science.
2. Educational technology studies the effect of science and technology upon education.
3. Practical aspects are important in educational technology.
4. Educational technology is a continuous progressive method.
5. Its goal is to improve the learning technique.
6. In the field of educational technology, psychology, engineering etc. are used.
7. In educational technology, systematic approach plays the main role.
8. Teacher, pupils and technical approaches are included in it.

Notes

9. Innovative teaching methods and new teaching techniques are emerging as a result of progress in educational technology.
10. It is possible to make necessary modification in teaching environment in order to fulfil the teaching goals.
11. Educational technology is helpful in making tools in accordance to teaching, economic, society and technical needs.

On the basis of above definitions and characters, it is clear that educational technology is a very descriptive word. It refers to the use of scientific methods for its working after organizing the entire teaching process. In the words of **Dr Anand** (1996), it includes a way which can be helpful in improving learning and teaching processes. Educational technology is related to almost all the process of teaching, learning, instruction and training such as determination of instructional objectives, planning of teaching related environment, preparation of learning and teaching materials, selecting the learning methods and techniques for teaching and to feedback the teaching and learning processes etc.

There was a time when educational technology was understood to mean only the audio-visual teaching tools. Today, educational technology has a very broad concept. Now the concept of educational technology is being used for such methods, techniques, compositions and mechanical equipment which can be used to improve the effectiveness of learning and teaching. Educational technology is called as a systematic and scientific endeavour in order to schedule, organize, forward and to control the effects technical and educational processes.

On the basis of above discussion the writer has defined educational technology as—**"Educational technology is a subject based on science, its objective is to make teachers, education and the student's task continuously simple. Together these three parts are well-adjusted so that they are competent and capable to attain their objectives through systematic approaches. Input, Output and Process—all three aspects should be taken into account."**

(Kulshrestha, S.P.,1980)

Self-Assessment

1. **Fill in the Blanks—**
   (*i*) "Education" is derived from .....
   (*ii*) Education is derived from the Latin word .....
   (*iii*) Education technology is based on .....
   (*iv*) Education technology is a continuous ..... method.
   (*v*) ..... Defines the fundamental behaviour of a child.

1.4 Assumptions of Educational Technology

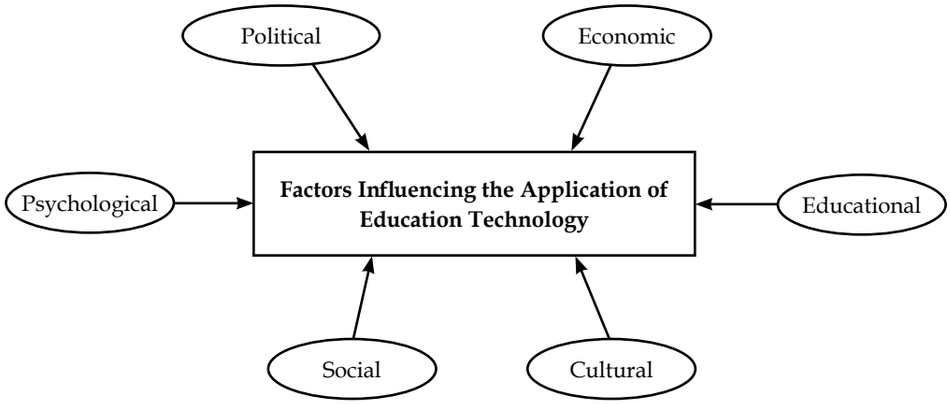
Educational technology is based on following assumptions—

(1) Every human works like machines. Therefore, in education scientific principles can be successfully used to scrape and finish this human behaviour.

(2) Education is both the art and science. Therefore, education can be analysed and can be divided into small learning facts, elements and ingredients. Then training, instructing and learning these facts, elements and ingredients is possible. Therefore, Education technology is based on systematic approaches.

Notes

Factors Influencing the Application of Education Technology



(1) Political Factors— The development of educational technology depends on various factors in any country. Political factor is one of the most important. Political factors are such that are related to nation's political circumstances, political policies, political objectives and scientific investigations. How is the policy of existing government of country in the field of development of education technology? If the ruling party finds the possibility of benefits of using any technology then perhaps it make necessary efforts to develop them. Therefore, it can be said that political factors do influence the educational technology. It plays an important role in the hidden innovation in the field of television and telecommunications and their dissemination.

(2) Psychological Factors— Psychological factors includes interest levels, trends etc. of teachers, students and institutions. Motivation of teachers, learning to teach, wills, attention and interest, etc. are included under the influence of psychological factors.

In educational technology, a lot of things depend on the individual interest of teachers and students, aptitude and efforts. If both the parts have the latest knowledge and information of educational technology, get the necessary instruction to use them, can have the benefits of various local and other sources for their use and finds it appropriate to use in the college environment then educational technology can play an important role in the important in the development of education.

(3) Educational Factors— These factors prove to be very useful with the psychological factors. Teacher's education and training are the main factors among educational factors. Teachers can be proved to be a milestone in the field of educational technology if they are provided the well-organized instruction. These teachers can be able to work in lab for using various approaches of education technology. These new experiments can provide effective leadership and healthy direction to innovative inventions and new dimensions by effective refinement and exploration.

(4) Economic Factors— Economic factors too have a great importance in the development of educational technology. Money is the backbone of any experiment, exploration or invention. Development, dissemination and training of any technology are not possible without money.

Economic grant is necessary for audio-visual aids and other equipment in the field of educational technology and for the development of its lab. Without money, neither equipment can be bought nor experiments can be done and it is possible refine and explore.

(5) Social and Cultural Factors— Society and culture are mirrors of education. As there will be the society and culture, the same will be education. No doubt, one can have a bright future in the field of educational technology it there is awareness in the society, there is dominating leadership and impact of technical terms is visible in the veins of culture. Then the school environment will be forced by people, parents and education experts to enact technical aspects. As a result of which educational technology can play its role in the temple of education.

Notes

Task Describe one factor that affects the use of educational technology.

1.5 Scope of Educational Technology

The field of educational technology is analogous to its concept. If educational technology is considered in terms of audio-visual aids then its field is limited to only audio-visual aids. If educational technology is referred to as programmed instruction then this field includes only programmed instructed learning objects. If we consider it as a systematic approach then it is a huge field.

Today, educational technology is no more audio-visual aids or programmed instruction; rather these are the parts of educational technology. Now educational technology is considered as a comprehensive science, so the field to vast and extensive.

Various scholars have interpreted various fields of educational technology in different manner.

Derek Rowntra, 1973 has explained the following fields of educational technology—

(1) Marking the goals and objective of learning.

(2) Employment of learning environment.

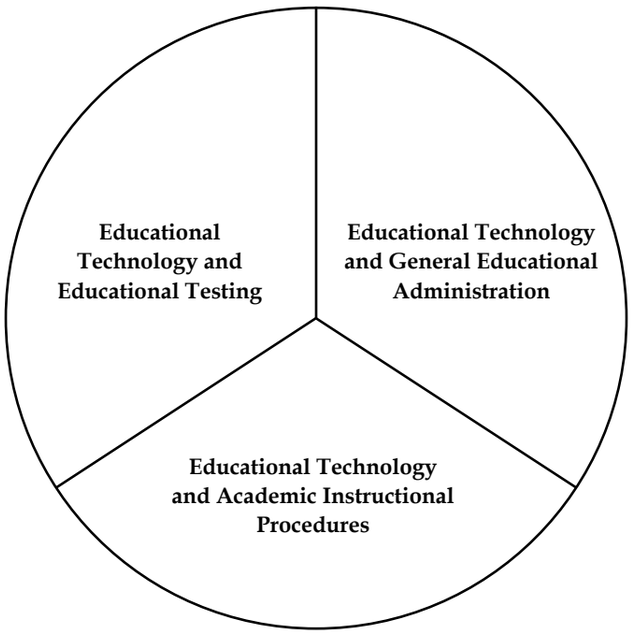
(3) Searching and structuring the courses.

(4) Selecting the appropriate teaching strategies and learning media.

(5) To evaluate the effectiveness of the learning system.

(6) In future, getting desired discernment to improve the effective based on feedback.

According to another scholar, educational technology is related to the general educational administration, educational testing and academic instruction procedures at the scientific level. It represented by the following figure—



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Takshi Sakamato explained that educational technology mainly organizes three aspects—**input, output** and **process** and is trying to improve after developing them. **B.C. Mathis** calls educational technology as the teaching array compositions, teaching methods and approaches and science and technologies. **Richmund** (1970) has divided educational technology into three parts—

(1) Designing Appropriate Learning Situation (2) Realizing objectives of teaching or training (3) Bringing best means of instruction

Davis considers that technical education and training as well as various learning resources are important in the field of educational technology. **Dr Bhargav** has divided it into five parts—

1. Learning and teaching process 2. Teaching array composition and learning paradigm and principles 3. Teaching and learning system 4. Operative research 5. Lesson planning.

The following topics were included in the Need based curriculum for B. Ed. courses in 1980 by **M.P. State Board of Teacher Education—**

1. **New concepts of educational technology**—School broadcast, television, programmed instruction, teaching machine and microteaching.
2. **Non-projective teaching aids**—Black-board bulletin board, chart, poster, graph etc.
3. **Projective teaching aids**—Development of film strip, film, tape library etc.
4. **Sources and use of Educational film, film strip and tape-recording.**
5. **Agencies of educational technology.**

Lumsdeine (1964), **B.C. Mathis**, **J.D. Finn** and **Dececco** etc. have divided the area of educational technology into two parts. These are—

1. Hardware Educational Technology

2. Software Educational Technology or Educational Engineering

Summer Institute of Educational Technology organized by Indore University suggested to include **Use-ware Educational Technology** in the areas of educational technology.

In 1971, **Takshi Sakamoto** represented the following types of areas of educational technology—

Areas of Educational Technology	Content
I(a) Educational technology I(a)	Educational technology I(a) is that branch which uses audio-visual aids and teaching resources
I(b) Educational Technology I(b)	Educational technology I(b) is related to appropriation of the educational system, regaining of the receipt of information and educational materials
II Educational technology II	In this educational objective are obtained by teaching and learning materials. It also uses Programmed Learning Materials.
III Educational technology III	It uses Human Engineering. The effect of the development of desk, board, class, tape-recorder, television etc. can be seen on educational behaviour.

Kulshrestha (1980) made his research in the form of detailed analysis and explained the displayed the different areas of educational technology through his diagram

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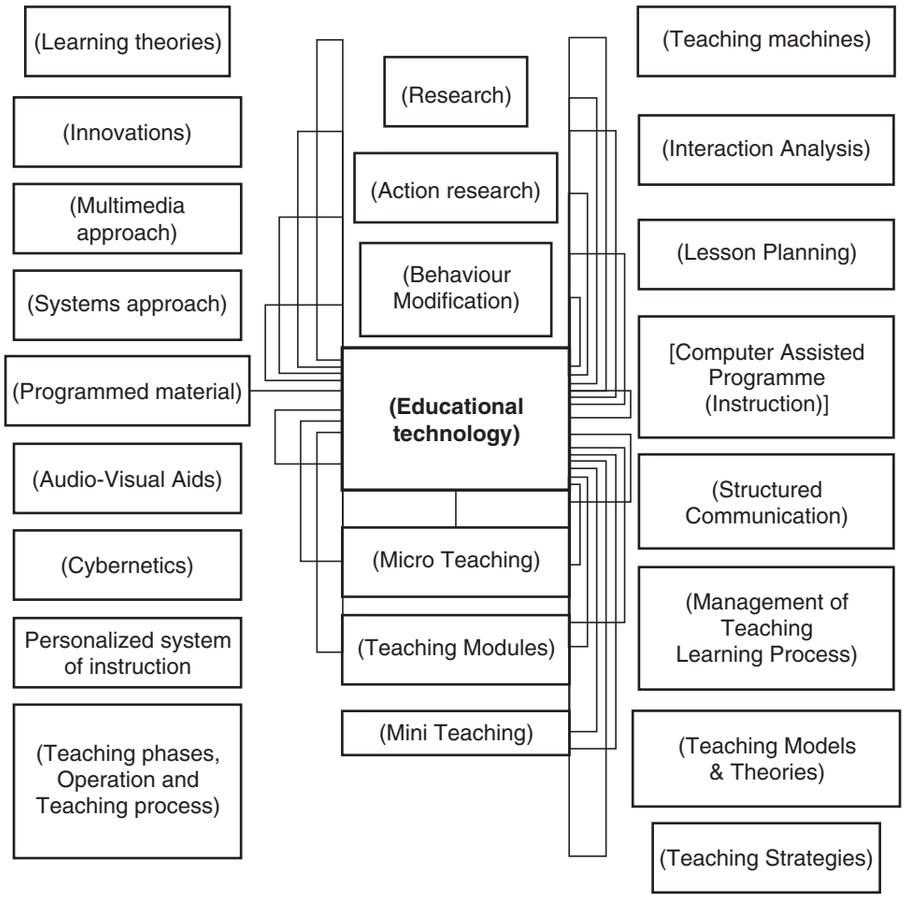

Area of Education Technology

1.6 Utility of Educational Technology

The utility of educational technology is increasing day-by-day. Every country in the world is adapting it. **Kothari Commission** (1966) said in one of his comments, "In the last few years' schools in India—has paid a great attention towards the methods classroom study." The purpose of basic education in primary schools was to bring revolutionary changes in the life and activities and the overall development of child's mind, body and spirit. From this perspective, the importance of educational technology is self-evident.

Educational technology course gives the appropriate importance to the teaching theories rather than learning theories. The utility of Educational technology can be explained easily by the following points—

(1) Utility for a Teacher— Teacher having educational technology command can study the student's behaviour, can understand them and can try to make desired changes. Teachers should have knowledge of behaviour, study and behaviour improving methods along with course materials. Educational technology enables the teacher in this area. Educational technology provides scientific knowledge to teachers about the teaching approaches, teaching array compositions and teaching

methods. At what time, which audio-visual aids should be used to clarify which phase, which types of radio vision and cassette vision should utilized for radio and television and which types of programmed instruction materials should be prepared for students to learn at their own pace—teacher learns all these things from educational technology. Educational technology provides directions for using various methods of micro teaching, simulated teaching and T. Training etc. in order to prepare an effective teacher.

Teacher uses system approach to study the issues related to educational administration and management. He can use programmed instruction as a solution of individual differences in the classroom. Singh and Kulshrestha (1980) has correctly written—"The teacher needs educational technology to bridge the lives of the children, aims of education and psychology in the present technological era."

The fact is that - Educational technology directs and helps teacher at each term, in every aspect and every point of his work whether creating a teaching strategies, selecting a teaching point, selecting the good method of teaching or understanding the students or solving his own teaching issues or improving his teaching as a career. Today, even a single step can't be taken without the help of educational technology.

(2) Utility of Educational Technology in Learning—Education technology provides us the knowledge of learning method and principles, studies the different methods to make the learned courses permanent and motivates the students to learn and helps them in maintaining their interest. It follows student's rule of learning at their own pace in the area of learning. Educational technology maintains teaching learning processes by their scientific interpretation. Also, educational technology is responsible for the creation new paradigm which explains us the nature of teaching and learning. In this way, educational technology can be made useful for teachers, students and everyone by making teaching and learning process more effective and meaningful.

(3) Utility to Society—The words said in the context of the educational psychology by Garrison etc. also applies to educational technology—We know in advance if we are…… (educational technologists), that certain methods will be wrong. Therefore they save us from mistakes and clarify human motives and thus make it possible to achieve understanding among individuals and groups (teaching and learning).

In society, people have the facility of radio, transistor, tape recorder etc. which can be used in the areas of education by means educational technology. Educational technology develops the cognitive, impressionistic and psychological aspects of teachers and students as well as people. For countries with limited resources, educational technology gives the gift of such methods which will help to promote, disseminate and expand the mass education. Educational technology through an influential teacher, politician or social reformer of the knowledge and skills can be easily transported to every section of society by using television, tape, radio and addresses etc.

Therefore it can be said that **"Educational technology in today's technological age increases the usefulness of teacher, teaches students and pupil teacher with effective methods and is very helpful in the accumulation of knowledge, promotion, dissemination and development of society."**

Self-Assessment

2. Multiple Choice Questions—

(*i*) Which is the most importance among the factors influencing the educational technology?

(*a*) Economic Factor (*b*) Political Factor

(*c*) Psychological factor (*d*) Educational factor

(ii) Day-by-day the utility of educational technology is

(*a*) Decreasing (*b*) Increasing

(*c*) Same (*d*) All the above

Notes

(iii) Which approach can be used by teacher to study the issues related to educational administration and management?

(*a*) Origin (*b*) Productive

(c) System (*d*) None of the above

1.7 Summary

- Educational technology is composed of two words—**education** and **technology**.
- The meaning of education in Hindi is **'Shiksha'**. It means—**To educate.** In other words, learning or academic - to achieve through the creation of rituals and practices is called education.
- Technology or Technological Science is a synonym of an English word 'Technology'. Technology means - **Methods of using scientific knowledge in daily life**.
- Educational technology is the application of scientific knowledge about learning to practical learning situations.
- Practical educational problems of the psychology of learning, educational technology investment is intense.
- "Educational technology is a subject based on science, its objective is to make teachers, education and the student's task continuously simple. Together these three parts are well-adjusted so that they are competent and capable to attain their objectives through systematic approaches. Input, Output and Process—all three aspects should be taken into account."
  - The field of educational technology is analogous to its concept. If educational technology is considered in terms of audio-visual aids then its field is limited to only audio-visual aids.
- Takshi Sakamato explained that educational technology mainly organizes three aspects—input, output and process and is trying to improve after developing them.
- The utility of educational technology is increasing day-by-day. Every country in the world is adapting it. Kothari Commission (1966) said in one of his comments, "In the last few years' schools in India—has paid a great attention towards the methods classroom study."

1.8 Keywords

- Approach—Come
- Topic—Reference

1.9 Review Questions

1. What are the assumptions of educational technology?
2. What do mean by "Technology"?
3. What is education?
4. Explain the utility of educational technology.
5. What is Kothari Act?

Notes

Answers: Self-Assessment

1. (*i*) Shiksha (*ii*) Educatom (*iii*) Science (*iv*) Progressive (*v*) Education
2. (*i*) (*b*) (*ii*) (*b*) (*iii*) (c)

1.10 Further Readings

Books

1. Educational Technology — *S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology — *Yogesh Kumar Singh.*

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Unit–2: Approaches to Educational Technologies

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Objectives

Introduction

2.1 Comparison between Software and Hardware Approach

2.2 Uses, Need and Importance of Hardware and Software Approaches

2.3 Principles of Using Hardware and Software Approaches

2.4 Classification of Hardware and Software Approaches

2.5 System Analysis

2.6 Principles of selection of Hardware and Software

2.7 Principles of Using Hardware and Software Approaches

2.8 Summary

2.9 Keywords

2.10 Review Questions

2.11 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand the comparison between software and hardware approaches.
- Understand the principles of using hardware and software approaches.
- Understand the classification of hardware and software approaches.
- Understand the system analysis.

Introduction

Lumsdane has categorized educational technology into three approaches —

(1) Hardware Approach or Educational Technology I

(2) Software Approach or Educational Technology II

(3) System Analysis or Educational Technology III

(1) Hardware Approach or Educational Technology I— In hardware approach, the emphasis is given to teaching-accessories. This approach is based on physical sciences and engineering technology.

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Physical sciences and engineering technology is the origin of this approach. Most people believe that the machine is technically linked to the educational technology. Education would be incomplete as long as the device like t.v., tape recorder and projector are not available in the field of teaching. Hardware approaches strengthens the concept of utilizing these equipment. **Davis** accepts that the hardware approach is based on the application of physical science to the education and training system which mechanizes the process of teaching gradually so that teachers would be able to deal with more students, resulting in less cost and economy in finances. **Marilyn Nickson** (1971), educational technology deals with the application of many fields of science to the educational needs of the individual as well as of society. According to **David** (1971), this technology is necessary for teaching and training. **Silverman** calls it as technology in education.

This approach resulted in the origin of Correspondence Education and Open University System. This approach plays an important role in the use of computers and machines for the compilation of research forms, analysis etc. **Silverman** (1968), called this type of educational technology **"Relational Technology".** In the words of **Dr. Ruhela**—"This part of Education Technology refers to tools and hardware such as teaching machines, T.V., tape recorder etc. which are used in instructions. In fact the selection and utilization of machines and hardware approaches in the field of learning is called Hardware Approach or Educational Technology—I.

Hardware approach was firstly described by **A.A. Lumsdeine**. This approach is also called as audio-visual aids. In this emphasis is given to **machine technology**. It believes that machine does the instructional work and it is related to the **cognitive side of instruction**. This approach emphasize on the following three facts—

(*i*) Preservation

(*ii*) Transmission

(*iii*) Advancement

Notes Hardware includes chalkboard, radio, overhead projector, slide projector, VCR, TV and monitor, computer, calculator, computer printing machine, audio-visual recorder etc.

In the words of **Dr. Kumar and Chandra—**

"It is important to note that these mechanical devices were not safety designed and invented to fulfil the instructional requirement. Rather, they were designed for communication, information and recreation etc. But now, we are using them in education and training system to achieve the educational objectives of our nation."

2. Software Approach or Educational Technology-II—In the field of software approach educational technology, psychological principles are used in place of machines which can bring the required changes in students. Technologies of this approach are also named as **Instructional Technology, Teaching Technology** and **Behavioural Technology**. In this approach, machines are used only to make presentation of courses more effective. In this technology the emphasis is given to all the three phases—input, output and process. **Skinner** and others considered that this technical approach is based on behavioural technology. According to **Arthur Melton** (1959), this teaching technology is based on psychological learning and this experience starts the process of providing the desired behaviour change.

According to **Davis** (1971)—

"This view of Educational Technology is closely associates with the modern principles of programmed learning and is characterised by task analysis, writing, precise objectives, selection of correct responses and constant evaluation."

Notes

Silverman (1968) termed it as "Constructive Education Technology". Both the education technology I & II are interlinked and they can't be separated from each other. Hardware approach deals with machines while software approach deals with principles of learning and teaching. In fact,

"It is the application of behavioural sciences or principles of psychology, sociology, and philosophy in Education and Training Interaction of behavioural sciences with education has generated a new concept and a new technique of programmed learning."

Many educationalists believe that software approach is more important as compared to hardware approach because hardware technology is of no use unless software approach is used in it. For example, following are some hardware approach and software related to them.

Sr. No.	Rigid Crafts (Hardware Approach)	Related Soft Crafts (Software)
1	Chalk board	Use of chalk
2	Overhead projector	Transparencies
3	Slide projector	Slides
4	VCR and monitor	Video program
5	Computer	Computer program
6	Audio recorder	Recorded matter
7	Blank page	Writing

(Table Based on Kumar 1996)

Arthur Melton has clearly written that the origin of software approach is the result of the efforts of **Skinner and others**. This approach is directly related to scientific learning which includes the behavioural changes based on experience.

(3) See paragraph 2.5 for system analysis or educational technology III.

2.1 Comparison between Software and Hardware Approach

In the words of **Anand** (1996), "Software approach is different from hardware approach in such a way that the hardware approach of educational technology uses teaching equipment while software approach use learning materials such as programmed instruction materials and techniques and methods of teaching strategies based on psychology of teaching strategies.

In hardware approach, machines are used for making the course material more effective while in software approach the emphasis is given to teaching strategies based on principles of teaching and learning rather than machines.

Did u know? These approaches cannot be separated from each other. They are interlinked. They motivate educational technology and are complementary to each other.

2.2 Uses, Need and Importance of Hardware and Software Approaches

1. These approaches are used to increase student's interest, inspire them and to make them curious.
2. By using these approaches, student's feels learning material more structured and clear.
3. These approaches play an important role in making the learning material more adaptive and simple.

Notes

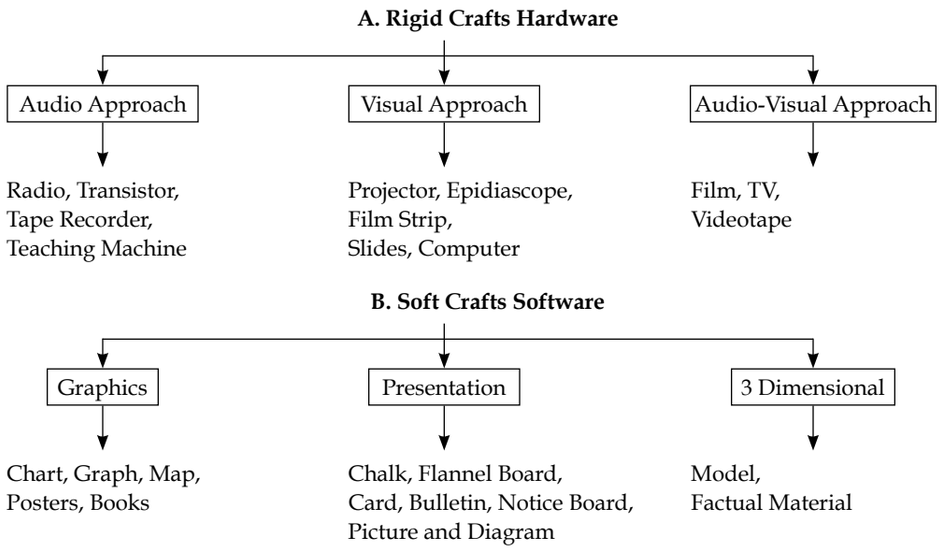
4. They are capable of making learning materials more attractive and interesting.
5. The student becomes more active in class activities by getting excited with these approaches.
6. They play an important role in the effective use of appropriate learning system by taking care of individual friendship of students.
7. These approaches are capable of making use of time, power and resources of teachers and students. More effective teaching in less time and with less effort is their specialization.

2.3 Principles of Using Hardware and Software Approaches

The emphasis is given to following principles to create more effective teaching process by these two approaches.

1. Principle of Selection
2. Principle of Purposiveness
3. Principle of Economy
4. Principle of Availability
5. Principle of Simplicity
6. Principle of Stimulation
7. Principle of Self-preparation

2.4 Classification of Hardware and Software Approaches



Self-Assessment

1. Fill in the blanks:

(*i*) In ..... approach, the emphasis is given to teaching-accessories.

(*ii*) Hardware approach was firstly described by .....

Notes

(*iii*) Educational technology I and II are interlinked and are ..... to each other.

(*iv*) Teaching machines are used in ..... approach of educational technology.

(*v*) Lumsdeine has mainly categorized educational technology into ..... Approaches.

2.5 System Analysis

System Analysis or Educational Technology III—System Analysis is termed as Educational technology III. It was developed after Second World War, it has scientific basis for decision making that concern about the administration, management, business and military problems. This approach is also termed as **Management Technology**. It is used for scientific study of educational administration and management problems. In other words, "Educational technology III provides full support in the development of educational administration and outline of instruction. By using this approach, educational environment becomes more useful and effective in fewer amounts. **Silverman** (1968) has presented this approach as below—

(*i*) Analysis is performed on the existing system to identify the parts and the interrelationships.

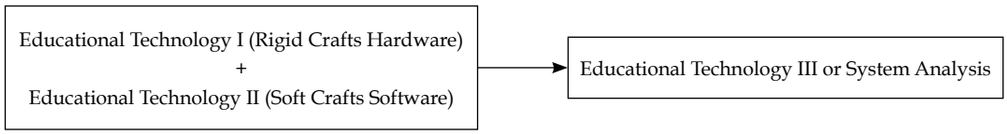
(*ii*) Synthesis is performed to combine these various elements together with new elements previously unrelated.

(*iii*) Models are constructed to predict the effectiveness of the system.

(*iv*) Simulation is carried out prior to implementation of the system in real life.

Educational technology III also includes **Training Psychology Design, Cybernetic Design** and Theory Reinforcement. This educational technology is becoming popular these days.

Educational technology III or system analysis was developed as a combination of hardware approach and software approach.



Educational technology III approach is a connector of Educational technology I and II. It has become a very modern approach by combining hardware approach and software which is being used in every field of education.

Educational technology III is in face based on **principles of psychology**. According to this, educational system can be categorized into four main elements:

Sl. No.	Class of the Key Elements
1.	Input
2.	Process
3.	Output
4.	Environment Context

Elements of System analysis (Educational technology III)

Input refers to those behaviour or abilities which are obtained from teachers and students before starting teaching in an educational system.

Process refers to such activities which help in changing the input or available behaviour.

Output refers to behaviour for which the entire system was created.

Environment context refers to such elements of environment which affect the system.

System analysis is done in order to solve the educational problems in educational technology III, which is used to improve the whole educational process.

This approach is pupil oriented. According to a scholar, **" In short, this approach is the method of reaching decisions to solve problems and provides full support in order to develop and increase the legal education and training according to new innovations."**

This approach is being successfully utilized in solving the educational administration and management problems.

This system analysis approach provides a scientific and numerical approach to solve educational problems. This approach is considered as more objective, scientific, organized and pure approach.

This approach is termed as **Educational technology III** or **system analysis,** some educationalist calls it as **educational management**. But educational technologists mostly consider it as **system analysis**.

Today, this approach is popular in the field of educational administration. By using this approach, education, education system, educational administration and management are considered to be very effective, moderate, less expensive and essential.

2.6 Principles of Selection of Hardware and Software

The principles of selection of hardware and software are explained below—

1. When selecting hardware, quality, popularity, reputation and durability and its value should be noted.
2. When selecting software, its content relevance, effectiveness and usefulness and requirement should be noted.
3. While selecting hardware or software, it should be remembered whether teacher is able to use that approach carefully in an effective way or not.
4. Hardware or software selection should be based on conditions of learning, students' needs, nature of content, school environment and their availability.
5. The same approach should be selected that is more usable, can increase interest, can inspire the students and is in accordance to needs.

Task Write Principles of Selection of Hardware and Software.

2.7 Principles of Using Hardware and Software Approaches

The principles of using of hardware and software are explained below—

1. One must have knowledge of these approaches before using them; he should understand the principles of these approaches and should learn how to use them. Before presented any approach, it should be checked whether it working properly or not. It should be repaired if not working properly.
2. Before using these approaches, teachers should prepare the mentally by explaining complete information about them. For example, before submitting lessons on the radio as T.V. students should know when the program will be broadcast, what are the contents of programs, which points of the

program should be taken care of. In the way the entertained contents are combined with classroom teaching after preparing them mentally.

3. Teacher should develop a learning environment in the classroom in order to use hardware and software approach. While submitting the contents, teacher should take care, if every student can hear the voice with proper pitch. The contents displayed are clearly visible to students. For this, appropriate arrangements should be done. Teacher should also take care of whether students are interested or not.
4. Before using hardware and software approaches, teacher should formerly review that under what classroom situations, which approach would be more viable, the same should be used. Unnecessarily and forcefully, the approaches should not be used only to show. The approaches should be used when needed.
5. Accordingly, teacher should have feedback of the approach used from time to time and he should try to improve and to increase the effectiveness of his future teaching.

Self-Assessment

2. State whether the following statements are True or False:

(*i*) System analysis is termed as Education technology III.

(*ii*) Education technology III was developed after the Second World War.

(*iii*) Education technology III is the connector of Education technology I and II.

(*iv*) Output refers to behaviour for which the entire system was created.

(*v*) Teacher should develop a learning environment in the classroom in order to use hardware and software approach.

2.8 Summary

- In hardware approach, the emphasis is given to teaching-accessories. This approach is based on physical sciences and engineering technology.
- **Marilyn Nickson** (1971), educational technology deals with the application of many fields of science to the educational needs of the individual as well as of society. According to **David** (1971), this technology is necessary for teaching and training. **Silverman** calls it as technology in education.
- Silverman (1968) termed it as "Constructive Education Technology".
- In the words of **Anand** (1996), "Software approach is different from hardware approach in such a way that the hardware approach of educational technology uses teaching equipment while software approach use learning materials such as programmed instruction materials and techniques and methods of teaching strategies based on psychology of teaching strategies.
- System Analysis is termed as Educational technology III. It was developed after Second World War, it has scientific basis for decision making that concern about the administration, management, business and military problems. This approach is also termed as **Management Technology**.
- ''In short, this approach is the method of reaching decisions to solve problems and provides full support in order to develop and increase the legal education and training according to new innovations.''
- Today, this approach is popular in the field of educational administration. By using this approach, education, education system, educational administration and management are considered to be very effective, moderate, less expensive and essential.

Notes

2.9 Keywords

- **Technology** – Technical
- **Instructions** – Directions

2.10 Review Questions

1. Explain the hardware approach.
2. Describe the Educational Technology II.
3. Elaborate the origin and development of software.
4. Describe the principles of using hardware and software approaches.
5. Describe System Analysis.

Answers: Self-Assessment

1.	(*i*) Hard	(*ii*) A.A. Lumsdeine	(*iii*) Complementary	(*iv*) Hardware	(*v*) Three
2.	(*i*) True	(*ii*) True	(*iii*) True	(*iv*) False	(*v*) True

2.11 Further Readings

Books

1. Educational Technology – *S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology – *Yogesh Kumar Singh.*

Notes

Unit-3: Micro Teaching

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3.1 History of Micro Teaching

3.2 Definitions of Micro Teaching

3.3 Assumptions of Micro Teaching

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3.5 Micro Teaching: An Educational Process

3.6 Micro Teaching Cycle

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3.13 Keywords

3.14 Review Questions

3.15 Further Readings

Objectives

After studying this unit, students will be able to:

- Familiarize with History of Micro Teaching.
- Understand the Assumptions of Micro Teaching.
- Understand the Principles of Micro Teaching.
- Learn Indian Model of Micro Teaching.
- Understand the Advantages and Limitations of Micro Teaching.

Notes

Introduction

Micro teaching is a new symbol of hope and excitement in the field of teaching and training and is a challenging voice call for teachers and trainers. Micro teaching has come as a boon for training colleges. As a result, today's teachers have started to talk about developing teaching skills. Micro teaching is kind of laboratory approach in which teachers practice their teaching skills that harms no one. This method is able to meet all conditions of the laboratory.

3.1 History of Micro Teaching

Micro teaching is a new method of controlled practice in the field of training. It was developed at Stanford University. **Acheson, Bush** and **Allen** introduced the first controlled '**Compressed Study-Practice Orders**' in which each teacher was teaching a small lesson to 5 to 10 students while others perform various role plays. Later they started using video tape recorder to make desirable changes to teaching behavior of a teacher. While working in the field of teaching competence **Harry Garrison introduced 'Stanford Teaching Competence Program**'. In 1967, **Clenvas** performed many experiments in the field of micro technology. Thus, **Allen** (1964), **Acheson** (1964), **Orm** (1966), **Tuckman, Alan** (1969), **Rasnik and Kiss** (1970), **MacLeez and Anvn** (1971) and many researchers made important contributions in the field. These researches-forms and reports began to attract the whole world. **D. D. Tiwari** (1967) first in India used the word 'Micro-technology' in the field of education-training. Although the 'micro teaching' means today was isolated from micro teaching. **Shah** (1970), **Chudasma** (1971), **Singh**, **Maskar**, **Pangutra** (1973) and **Doshaj** undertaken this sector in the year 1974.

The first publication in the field of micro-education in India in 1974 was published by **Pasi** and **Shah**. The first micro-teaching about scientific information provided. Later **Bhatacharya** (1974), **Pasi**, **Lalita** and **Joshi** (1976), **Singh Garewal** (1977) and **Gupta** (1978) worked in this area. In 1978, a National Proposal for the Project was started on 'micro-teaching' at Indore University. Teachers and educators of various colleges and universities worked on micro-teaching. This research was completed in cooperation with Delhi's 'National Council of Education, Research and Training' (NCERT).

Notes In India, research of Micro-teaching is being processed majorly in Delhi, Indore, Baroda, Saharanpur and Dehradun.

In Dehradun in 1979, **Kulshreshtha**, **Goswami** and **Mishra** working in the field of micro-teaching, served on many educational reforms as India's first monograph Mini Teaching A New expirement in Teacher Education, New Delhi in collaboration with N C E R T published.

Now in India micro-teaching and considerable work is being done on Mini Teaching.

3.2 Definitions of Micro Teaching

Micro-teaching is an **experimental** and **analytical** method of education training through which teacher's teaching-skills are developed. **Allen** (1968) defined is as follows: "Micro teaching is training related suffix in a situation of pre-service and in-service teachers for the commercial development. Micro-teaching presents a plan for teaching practice that reduces the complexities of normal classroom and teachers receive feedback in large part for their teaching practice." **V. M. Shore** defined is as follow: "Micro teaching is a practice of small time, few students and of fewer teaching practices."

Notes

MacLeez and **Unwin** (1970), "The micro-teaching student teachers usually simplified by the use of television closed environment for the process of the performance-related feedback is immediately available ..... Micro teaching is generally considered to be the nature of the study represented complications typically abstract concept or actual reduction to practice reading the feedback process on the basis of classroom teaching is provided".

According to **D. W. Allen**, "Micro-teaching is scaled down teaching encounter in class size and class time."

According to **Clift** and **Others**, "Micro-teaching is a training procedure which reduces the teaching situation to a simpler and more controlled encounter achieved by limiting the practice teaching to a specific skill and reducing time and size."

According to **Bush**, "Micro-teaching is a training procedure in which teacher prepares a lesson by using his teaching skills carefully, interact with a small group of actual students on the basis of lesions prepared. As a result he gets the opportunity to achieve observations on videotape." (In the Indian Model of Micro technology, human observers has been recommended to replace video tape.)

Allen and **Ryan** said that micro teaching is based on the following five basic principles:

(1) Micro-teaching is the actual teaching.

(2) In this teaching of the common complications class-education is reduced.

(3) Only a special task and a skill is emphasized at one time.

(4) It is possible to control to exercise procedure.

(5) Feedback is provided soon.

In the words of **Prof. B.K. Passi** "Micro-teaching is a training technique which requires pupil-teacher to reach a single concept using a specified teaching skill to a small number of pupils in a short duration of time."

In the words of **L.C. Singh** "Micro-teaching is a scaled down teaching encounter to which a teacher teaches a small unit to a group of five pupils for a small period of five to twenty minutes."

Micro Teaching is by **N.K Jangira** and **Ajit Singh**: "Micro-teaching is a training setting for the student teacher whose complexities of the normal classroom reaching are reduced by practising one component skill at a time, limiting the content to a single concept, reducing the class size to 5-10 pupils and reducing the content of the lesion to 5-10 minutes for teaching practice."

According to **Srivastava, Singh** and **Roy** (1978), "The meaning of the word Micro can be a complex one because it divided into small means micro units in which teacher is trained very carefully. Therefore, Micro is the correct word."

Grifiths (1973) after analyzing the various definitions says, "As Micro-teaching is very flexible and adaptable process, it is not fair to bind it in a specific definition".

Did u know? Micro teaching is a developing trend under which content, teaching-time and teachers are reduced while teaching skills of pupils teachers are very well developed. (Dr Kulshrestha, 1979)

3.3 Assumptions of Micro Teaching

The basic assumptions of Micro teaching are—

(1) Teacher's behaviour pattern is necessary for effective micro teaching.

(2) Motivation plays a critical role in the transformation of the expected behaviour.

Notes

(3) Teaching is a therapeutic procedure or plan.

(4) Teaching-objective observation of actions is required for best training.

(5) Teachers must be given adequate opportunity to improve.

(6) Teaching process can be upgraded by improving individual's teaching skills.

(7) Micro-teaching is a very small and simplified form of teaching.

3.4 Principles of Micro Teaching

Allen and **Ryan** (1968) explained that micro teaching is based on the following five basic principles:

(1) Micro-teaching is the actual teaching.

(2) In this type of teaching the common complications class-education is reduced.

(3) Only a special task and a skill are emphasized at one time.

(4) Exercise procedure is more controlled.

(5) Feedback is provided soon.

3.5 Micro Teaching: An Educational Process

It is a scaled down teaching technique, scaled down in terms of class size, lession, length and teaching complexity.

Micro teaching process contains the following terms—

(1) Teacher offers practical knowledge and principle of micro teaching to pupil teachers. It is known as **Introduction session**.

(2) Teacher specifically states the teaching skills which are to be developed and interpretation of **psychological bases** to pupil teacher.

(3) Teacher presents an ideal lesson on micro teaching for pupil teacher.

(4) Teacher and pupil teacher closely analyze the shortcomings and discuss the characteristics of the ideal text and determine its learning–skills.

(5) Teacher provides pupil teacher the needed time to prepare '**micro-lesson plan**' and assists them personally.

(6) According to instruction, class teacher teaches micro-lesson for 5 to 15 minutes (The lesson is recorded on a tape recorder), it is called teaching session.

(7) After teaching class teacher discusses the micro lesson with teacher in detail. Both good and bad point viz. shortcomings and strengths of pupil teacher's teaching skills are discussed at this time and he is suggested to re-prepare the lesson.

(8) After this critical session, pupil-teacher changes the teaching plan according to the recommendations and re-teach the necessary amendments. This is known as "session of re-creation of lesson".

(9) Thus pupil teacher teaches the re-created lesson to other students of the class. This teaching is also recorded on tape recorder. It is called re-teaching session.

(10) Re-criticise session come after re-teaching session.

The micro teaching process can be explained as on next page—

Notes

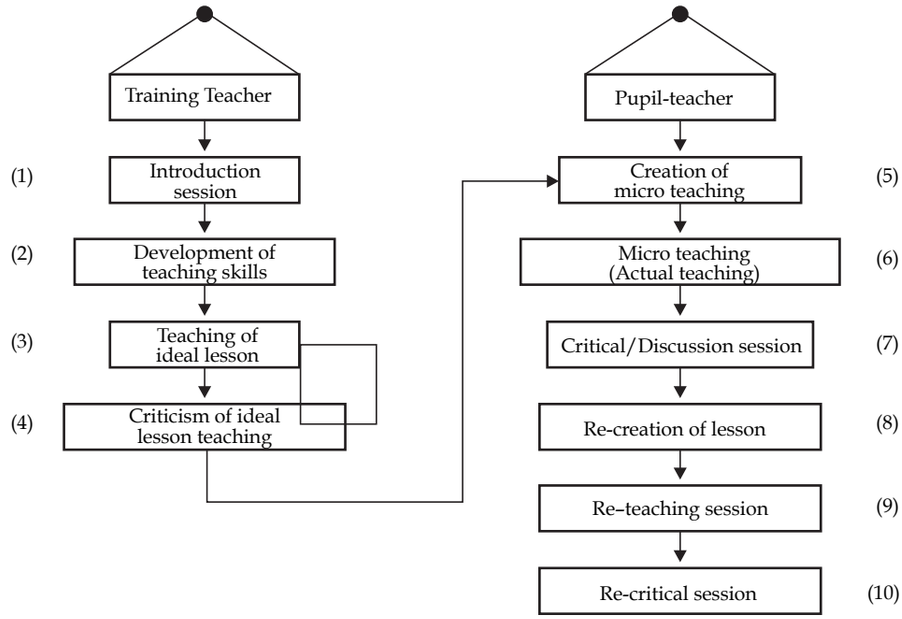

Figure — (Process of Micro Teaching)

3.6 Micro Teaching Cycle

The process described above continues until the pupil teacher gets the excellence in specific teaching skills. The collection of teaching, lesson planning, re-plan, feedback, re-feedback and re-teach makes a cycle which continues until the pupil teacher gets the excellence in specific teaching skills. This cycle is called as **Micro Teaching Cycle**.

Based on above details of Micro teaching cycle, various sessions can be presented by figure given below—

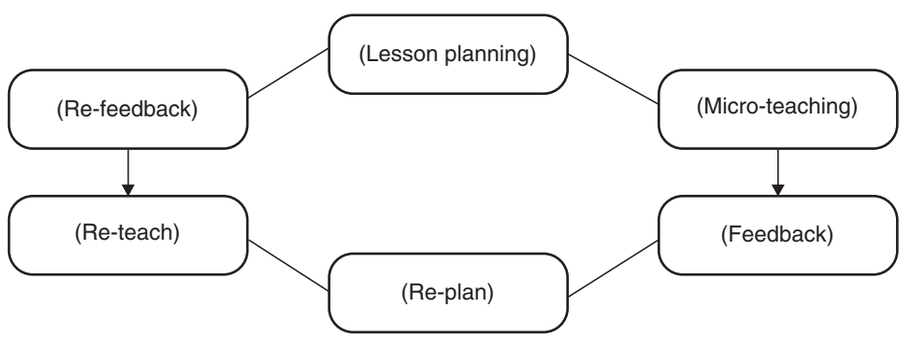

Figure — Micro Teaching Cycle

Task What is Micro Teaching?

Self-Assessment

Notes

1. **Fill in the blanks:**
   (*i*) Teacher offers practical knowledge and principle of micro teaching to pupil teachers. It is known as …… session.
   (*ii*) …… teaching is a very small and simplified form of teaching.
   (*iii*) Micro teaching is the ……. Teaching.
   (*iv*) Micro teaching is an experimental and ……. Teaching method.
   (*v*) Micro teaching is a ……. process of controlled practice in the field of teaching.

3.7 Micro Teaching Process: A Brief Description

In the process of micro teaching, pupil teacher is told about teaching skills and then specified by the performance. Pupil teacher observe the skills through patterns and obtain specific information by conversation. Then lesson is prepared and taught. Its video or audio is recorder through tape recorder. When lesson ends, it is discussed with the inspector. This way is used to evaluate pupil teacher and suggestions for improving the lesson are given. Then pupil teacher re-plans his lesson and teacher other students of the same class and feedback session starts. This type of training is given to pupil teacher in universities to improve their teaching skills.

Techniques used in Micro teaching

Micro teaching was developed **Stanford University**. Following techniques were used there

Teaching session	5 minutes
Feedback session	10 minutes
Lesson re-creation session	15 minutes
Re-teach session	5 minutes
Re-feedback	10 minutes
Total time	45 minutes

Following techniques were used at **Ulster University**

Teaching session	15 minutes
Feedback session	7 minutes
Lesson re-creation session	8 minutes
Re-teach session	15 minutes
Re-feedback	15 minutes
Total time	60 minutes

D. A. V. College, Dehradun after several experiments, the following methodology was adopted by **Mishra**, **Kulshreshtha** and **Goswami** and found it more viable.

Teaching session	6 minutes
Feedback session	6 minutes
Secondary Feedback session	4 minutes
Lesson re-creation session	7 minutes
Re-teach session	6 minutes
Re-feedback	6 minutes
Total time	35 minutes

Notes

3.8 Indian Model of Micro Teaching

In India, the Indian model of Micro Teaching has been developed as a result of efforts of NCRET, CASE and Indore University. It has the following characteristics:

(1) Discussion method is used in place of costly thing (such as video, closed circuit TV etc.)

(2) Costly inspection and feedback tools used in foreign are replaced by trained inspectors.

(3) The micro-teaching sessions are conducted in simulated conditions in which fellow B.Ed trainee has the main role.

(4) Micro-level assessment of teaching and learning in the Indian circle pattern is as follows—

Number of students	5 to 10
Type of students	Students of school or B.Ed. students
Inspection and feedback	Principal or fellow of B.Ed. student
Teaching time	6 minutes
No. of skills	One on one
Content	Single teaching step
Total time	36 minutes

(5) Total time of Micro teaching cycle of Indian Model is 36 minutes. Its time division is as follows:

Teaching	6 minutes
Feedback	6 minutes
Re-plan	12 minutes
Re-teach	6 minutes
Re-feedback	6 minutes
Total time	36 minutes

(6) This model is cheap and more flexible.

(7) Indian paradigm has sufficient space to coordinate skills.

3.9 Advantages of Micro Teaching

There are many advantages of training process of micro teaching—

(1) Micro teaching simplifies the teaching process.

(2) Pupil develops his teaching skill by focussing according his capabilities and tries to learn them.

(3) Feedback adopts and completes all approaches.

(4) Objective evaluation is done for pupil teacher.

(5) Pupil teacher has a right to keep his side in the feedback and kept active in feedback session.

(6) Inspector acts as a consultant for pupil teacher.

(7) It reduces the complexities of class-reaching.

(8) This method fills the pupil teacher with self-confidence.

(9) This method teaches more in less time.

(10) Through this method pupil teacher is taught to teach smaller classes, fewer students and smaller teaching step rather than directly teaching a class. This proves to be very helpful for him.

Notes

3.10 Limitations of Micro Teaching

Although micro teaching bound many steps of teaching process but it has some limitations, for example—

(1) This leads to controlled and compressed learning that is beyond the limits.

(2) This teaching takes off the classroom teaching.

(3) At a time only one teaching skill develops which consequently seems to be difficult to integrate them later.

(4) It takes more time.

(5) It is difficult for pupil teacher to get feedback soon.

(6) There is adequacy of motivation in order to develop excellence in teaching skill.

(7) It ignores the diagnostic and remedial work.

Due to above limitations a number of modifications and improvements are being made in micro teaching method. Mini teaching is an example for this.

3.11 Uses of Micro Teaching

In Micro-teaching method learning process is used by taking care of its various aspects.

Principle and practice are integrated in this method. This method is proficient for the excellence of art of teaching on the basis absolute principle of the step. The uses of micro teaching were explained by **Ramdev Kathuria (1979)—**

(1) Micro technology develops commercial maturity.

(2) Due to micro teaching the teaching process becomes completely clear to pupil teacher and they understood their teaching work.

(3) In micro teaching pupil teaching gains excellence on his teaching skills. Consequently, in the short time they are able to efficiently use the desired skills.

(4) In micro teaching, pupil teacher gets organized, objective, specific and immediate tasks.

(5) In micro teaching, teaching skills are practised in simple situation instead of complex situations.

(6) In Micro teaching full attention is given to the individual variation of pupil teacher.

(7) Micro teaching is more effective in changing behaviour of pupil teacher.

(8) Integration of theory and practice is possible in micro teaching.

(9) It is done in a situation of simulation then it is possible to get the proper training without get the actual school.

(10) This method is useful for reducing the rigidity in the behaviour of in-service teacher and bad habits of teaching.

(11) In the micro-teaching method, it is possible self feedback and criticise own teaching.

(12) It gives a new form to inspection method.

(13) This method inspires teachers for present and future experiment. Teacher tries to become able and spends more time for continuous study.

At the end we can say that micro teaching is a perfect way to provide training to pupil teacher at teacher training colleges which is used to produce good teachers. Teachers employed in teacher training colleges have to explain the correct knowledge and its proper use in order to prove this method viable.

Notes

Self-Assessment

2. Multiple choice questions:

(*i*) To whom teaching skills are provided?

(a) Pupil teacher (b) Student

(c) Teacher (d) None of these

(*ii*) What type of teaching process exits in micro teaching?

(a) Difficult (b) Simplified

(c) Moderate (d) All of the above

(*iii*) What develop commercial maturity?

(a) Training (b) Teaching

(c) Micro teaching (d) All of the above

3.12 Summary

- Micro teaching is a new method of controlled practice in the field of training. It was developed at Stanford University. Acheson, Bush and Allen introduced the first controlled 'Compressed Study-Practice Orders' in which each teacher was teaching a small lesson to 5 to 10 students while others perform various role plays.
- The first publication in the field of micro-education in India in 1974 was published by Pasi and Shah. The first micro-teaching about scientific information provided.
- Micro teaching is an experimental and analytical method of education training through which teacher's teaching-skills are developed.
- Micro-teaching is a training technique which requires pupil-teacher to reach a single concept using a specified teaching skill to a small number of pupils in a short duration of time.
- In the process of micro teaching, pupil teacher is told about teaching skills and then specified by the performance.
- In India, the Indian model of Micro Teaching has been developed as a result of efforts of NCRET, CASE and Indore University.
- Micro teaching bounds many steps of teaching process.
- In Micro-teaching method learning process is used by taking care of its various aspects. Principles and practices are integrated in this micro teaching.

3.13 Keywords

- **Pattern** — Format
- **Skill** — Ability

3.14 Review Questions

1. Write the Ellen's definition of micro teaching.
2. Write the basic assumptions of micro teaching.

Notes

3. Write the principles of micro teaching.
4. Draw and explain sessions involved in micro teaching.
5. Write the characteristics of Indian model of micro teaching.

Answers: Self-Assessment

1. (*i*) Introduction (*ii*) Micro (*iii*) Actual (*iv*) Content
(*v*) New

2. (*i*) (a) (*ii*) (b) (*iii*) (c)

3.15 Further Readings

Books

1. Educational Technology — *S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology — *Yogesh Kumar Singh*
3. Micro-Teaching: The Theory and Practice — *Naresh Kumar Yadav, Air Education of India*
4. Micro Teaching and Learning Paradigm — *Ramdev Prasad Kathuria, Vinod Pustak Mandir..*

Notes

Unit–4: Simulated Teaching (Simulation)

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4.1 Simulation : Meaning and Definition

4.2 Elements of Simulated Teaching

4.3 Procedure of Simulated Teaching

4.4 Steps of Simulated Teaching

4.5 Characteristics of Simulated Teaching

4.6 Limitations of Simulated Teaching

4.7 Summary

4.8 keywords

4.9 Review Questions

4.10 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand the meaning and definition of real teaching.
- Know the reality of teaching content and method.
- Do practical steps of learning, to understand the characteristics and limitations.

Introduction

Several methods for creating useful and effective teacher training have been developed. Simulated Teaching is one of them. This method is called simulation or customized training. **Kersh** first villages in the area of training used in teaching. In 1966 **Cruck Shank** in the U.S. is used to make effective teaching practice. Is the real meaning of role play simulation. Literally, it means exactly-To imitate. Like all true teaching in a given situation to make artificial reality is called teaching.

4.1 Simulation: Meaning and Definition

Histrionically also used in teaching means customizing. Histrionically method is introduced to students knowledge of the situation, after which, through conversation and discussion subject is extended.

Notes

Customized teaching method is considered by the Second World War. Used to train for war, real war is not possible. Therefore, different array compositions of war and war-like techniques to train artificial conditions is constructed and Training is provided. In this process, an action is presented in lifelike artificial conditions.

The teaching method used nowadays in business management, administration, medicine, teaching and training in the field of business.

Simulated Teaching

The precise method of teaching learning and training through the act of pupil teacher problem—Ability to resolve behavior develops and provides training to teach him very well.

Reality by acting in teaching and specific communication skills for the development of a complete artificial conditions are teaching. The behavior of learners sorted and organized learning in artificial conditions—experiences while maintaining desirable change is brought about by the spontaneity.

According to **Wing** "Creating artificial conditions is the When the student teacher to meet specific customized materials have to be the desired response." He Consider the actual circumstances that represents simulation.

According to **Cruick Shank** "Practical teaching is to create artificially a real situation in which your current or future actions by the participants resolve problems Sambndhti experience possible."

According to **Trancy** and **Anwin** "A simulation of a situation or environment by customizing often represents the actual conditions that is less complicated and less time-consuming."

Customized learning implies the use of simulation training." Customized teaching a teacher training technique, which the student teacher is to develop teaching skills. By this method, the student teacher teaching practice skills in simulated situations are given."

Did u know? In fact it is customizing the student teacher teaching a class Special discharge their role as students A student teacher, the teacher plays the role of Inspector live in one or two student teachers. And proficiency in a particular skill to do the work of teaching in these artificial conditions. (Kulshreshtha 1975)

Thus, they are ready for effective learning in real situations.

4.2 Elements of Simulated Teaching

According to **Cruick Shank** there are three main element of Simulated Teaching—

Elements of Simulated Teaching

(1)	(2)	(3)
Diagnostic Element	**Prescriptive Element**	**Evaluative Element**

(*i*) **Diagnostic Element**—As a doctor does diagnose the patient's illness symptoms, as well as a teacher helps students diagnosed their weaknesses and strengths. The teacher tries to overcome these weaknesses diagnosed and Strengths in the future to maintain their places as loudly.

Notes

(*ii*) **Prescriptive Element**—Students' weaknesses and strengths diagnose difficulties, on the basis of their qualifications and skills that students attempt to treat and Students are striving to bring behavioral change.

(*iii*) **Evaluative Element**—To evaluate the achievement of remedial actions which the teacher activities, they all come under the process of evaluation. This indicates that the evaluation of teaching pre-determine how, and to what extent determine which would have been received. Accordingly, when you're not satisfied, diagnosis, treatment and evaluation of the process is repeated.

4.3 Procedure of Simulated Teaching

Three major types of real-time training in teaching roles have had to juggle. They are—

(1) Teacher (2) Student (3) Inspector

These three types of roles alternately play teacher. In the process, the first to play the role of teacher educators. The fellow students play the role of teacher. The role of the teacher is the teacher teaches the lesson. In it teaching session is of 6 to 15 min. Student count also from 5 to 15. Like fellow inspector one or two teachers are evaluated. Teacher at the end of the text on the Properties inspector to discuss defects and Encourage teachers to improve their teaching.

Self-Assessment

1. Fill in the blanks:

(*i*) Real meaning of Simulation is .....

(*ii*) The use of Simulation teaching method is considered from ..... world war.

(*iii*) Customized teaching is a technique of Teacher .....

(*iv*) A pupil teacher who is in the role of Teacher teach the .....

(*v*) At the end of the lesson ..... discuss the merit-domerit of the teacher.

4.4 Steps of Simulated Teaching

(1) Orientation—First, all information is provided regarding teacher education a reality. The real meaning of the teacher and the Samprtyy is clear, its importance and use are explained and the procedure is explained.

Students, teacher, student and observer's role is to explain the role and appropriate training is provided for subsistence.

Therefore, there are three main functions under the stair—

(1) Provide accurate information to the students learning.

(2) **Role selection**—What role do under it, the decision is taken. How will the roles, roles that are discussed on how to play this.

(3) **Select the teacher role play**—Who is the teacher who will act on it, are discussed and the teacher, student and teacher of the inspector is selected.

(2) Selection of Skills for Practice—The stair under which it certainly is—who will be trained in teaching skills. Teaching skills and their importance when selecting the focus is on utility. Such skills are available, whose use in the teaching of all subjects to be taught in school as possible. Interpretation skills are selected, the discussion and deliberation is done. Key elements are introduced to their nature, the teacher creates lesson plans based on the selected teaching skills.

(3) Determination of Sequence—Reality by learning skills that are selected based on their exercise program after Lesson planning is made. To what skills will be first, what skills will be when it is used to determine the order. This step is used to determine the order in which the teacher and the order in which they practice different teaching skills which will role.

(4) Determination of Observation Techniques—It is used to determine what type of teaching skills for the practice of observing the system will be stored. Ex Audio Cassette the will be used. Thus, the equipment to observe and practice teaching skills and what methods will be used, it is decided Here it is also certain that the observations in which the points will be observed, and Which method will be adopted to nourish.

(5) Organisation of First Practice Session—When the entire system is held the first practice session. Nutrition practice session immediately after the page is given by supervisors and suggestions for improvement are necessary. The session lasts until the turn of the teacher does not come to practice.

(6) Providing Mastery Over Teaching Skills—Each teacher teaching skills then keep practicing until he receives the full dexterity skills. Him to a second teaching skills are put to practice skills..And also to master is the third practice teaching skills. Thus, the sequence continues.

Notes Description of the main steps of simulation is given here. It can be changed according to the requirement and facilities.

4.5 Characteristics of Simulated Teaching

(1) The student work naturally in artificial conditions.

(2) The students have the opportunity to be master in various skills.

(3) There are many opportunities for students to rehearsal.

(4) The pupil - teacher who is playing teacher's role get immediately feedback after completing the lesson.

(5) This method is simple, easy and very useful.

(6) By using this method confidence of teacher awaked.

(7) Without teachers teaching in school as part of the school are learning opportunities, thereby increasing their experiences and increasing interest in teaching.

(8) School is not being addressed because of the problem, the method teaching practice teaching method is accurate.

(9) Actual teaching practice in the school is not teaching. Therefore, students would not harm any of the studies.

(10) Actual teaching of teachers face many difficulties. Much lower than the actual conditions in real educational problems are revealed.

(11) In reality teachers teaching different learning skills are mastered, thus teaching them in full, efficiency is relatively simple and intuitive.

(12) Develop the ability to sort the text is presented.

(13) Interest in this method, and rich in inspiration and enthusiasm.

(14) Reality of teaching in the classroom teacher is learning the right way to behave.

Notes

4.6 Limitations of Simulated Teaching

(1) Practical training at the beginning and end time of the teacher and consequently some difficulties sometimes they can be discouraged.

(2) Many times inspector who plays the role of teachers, lack of experience in the right way can not subsist.

(3) Teacher evaluation sometimes makes false marking, which may lead to mutual misunderstandings.

(4) Students often internalized teacher who plays the 'boys' play experience difficulties in the classroom, which do not act as a real classroom.

(5) Many teachers do not fully follow the instructions or do not understand the true teaching of the key elements to create the ideal situation is difficult.

Task Write limitations of simulated teaching.

Stone follows the true interpretation of the importance of simulated teaching—

Simulated Teaching Technique—Artificial state, often in the same room teacher learning, self-learning and practicing skills in classroom teaching skills is to collect. Artificial conditions for learning by teaching exemplary teacher training, The first stage progression by making it easy for teachers to focus on the actual situation without learning complex skills enables. It is understood that only fair to inform students of classroom teaching and how does one control, Just as a pilot exercise simulated control is provided When he is not flying in the air, then told him how it should be.

Use

(1) Develop the ability to ask questions in teaching.

(2) Used in order to develop a potential questions.

(3) General practice of classroom teaching.

(4) Sort text presented as the ability to develop.

(5) Follow the steps in problem solving teaching is consistent manner.

(6) Classroom learning capabilities to present in summary form.

(7) Deductively to lecture capabilities.

Self-Assessment

2. State whether the following statements are True or False:

(i) Teaching skills and their importance when selecting the focus is on utility.

(ii) Nutrition practice session immediately after the page is given by supervisors.

(iii) Acquiring skills on one another to practice teaching skills are taught.

(iv) Students do not receive many opportunities for rehearsal.

(v) Exemplary Teaching in artificial conditions, teacher training for teaching.

Notes

4.7 Summary

- Several methods for creating useful and effective teacher training have been developed. They are simulated teaching.
- Like all true teaching in a given situation to make artificial reality is simulated teaching
- The precise method of teaching and training is learning Resolve the problem of teacher behavior through the Act seeks to develop the competency And provides training to teach him good
- As a doctor does diagnose the patient's illness symptoms, as well as a teacher of students diagnosed their weaknesses and strengths helps.
- First, all information is provided regarding teacher education a reality. Teaching them the true meaning and it is clear meaning, its importance and use are explained and the procedure is explained.

4.8 Keywords

- Simulation—Emulation
- Supervisor—Observer

4.9 Review Questions

1. Write precise definitions given by various scholars of simulated teaching.
2. Describe the elements of the simulated teaching.
3. Explain the steps of simulated teaching.
4. Write the characteristics of simulated teaching.

Answers: Self-Assessment

1.	(*i*) Role Play	(*ii*) Second	(*iii*) Training	(*iv*) Lesson	(*v*) Inspector
2.	(*i*) True	(*ii*) False	(*iii*) True	(*iv*) False	(*v*) True

4.10 Further Readings

Books

1. Education Technique—*S.K Mangal, P.H.I Learning.*
2. The Basic Premise of Educational Technology—*Yogesh Kumar Singh.*

Notes

Unit-5: Flander's Interaction Analysis System

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Objectives

After studying this unit, students will be able to:

- Know teaching behavior.
- Understand the Flander information system for the analysis of the interactions.
- Know the rules of inspection.
- Learn the basic concepts of Flander.

Notes

Introduction

Meaning—The various actions the teacher in the classroom, teachers and students in the classroom as a result of the inter-actions between the different types are. **The interconnection procedures are key attributes of teacher behavior. Teacher attitudes are reflected in the analysis of these inner processes. "Teacher behaviour may be defined as a function of the characteristics of the teacher, his environment and the task in which the teacher engages."**

5.1 Teaching Behaviour

Teacher behavior, **learning behavior** is different from the concept. Teaching practice includes a variety of activities, whose principal aim is the 'teaching - learning' objectives. Write on the blackboard, decode, display, asking questions, responding, to provide guidance, to praise, to motivation, to encourage students to class actions, behavior assessment, etc., are examples of teaching practice. (Singh, 1992)

In the words of another scholar—

"The teaching behaviour conceived in this way becomes a system of activities or acts or operations which can be analyzed in terms of each specific activity or act or operation. It employs the intellectual process in a well organised form."

On the other hand, teacher behavior, teacher personality characteristics, his mastery of his attitudes, his sensitivity and his verbal and nonverbal behaviors are included.

"As a matter of fact the term teacher behaviour is very wide and it may include teaching behaviour with all activities or acts or operations relevant to the achievement of specific goals of teaching."

According to **Ryans**, "Teacher attitudes, behaviors or actions that individuals can be defined as what they do. And the actions of their needs, especially for such learning activities which relate to direction or guidance".

There are two features of teacher behavior—

(1) Teacher's behavior, their circumstances, are based on factors and characteristics.

(2) Is possible to observe the behavior of the teacher is impossible to observe the behavior of the teacher, so the measurement is also possible.

Withal (1949), **Flander** and **Amidon** (1960), **Medley** and **Mitzel** (1948) and **Galloway** (1968) was shown in Systematic Observation through the efforts of teachers to study behavior. Through systematic approaches, systematic inspection is done. "**Systematic inspection, a process which is used to observe classroom practices**." In other words, systematic inspection technique under certain rules of behavior by a teacher or teaching activity are analyzed. Efficiency and its ability to estimate teacher teaching her Effectiveness can be gauged. But the teacher's objective evaluation of teacher behaviors and interactions with students that can be done by.

Notes Meaning of Interaction Analysis is a system by which the events happening in classrooms are observe and systematic and objective scientific analysis is done.

It is a kind of specific research activities, which support all the actions and practices of classroom inspection, marking and are being analyzed.

According to **Over**, "Systematic observation represents a useful means of identifying, classifying, studying, measuring specific variables as they interact within the institutional learning situations."

Notes

From last 60 to 65 years Academic classroom behaviors to the classroom observation systems are used, they can be divided into two categories—

Classroom control System

Signal system | Category system

Signal system is a list of teacher behaviors. Inspector, teacher forebodings which the behavior occurs in the showroom.

Range of different behaviors in the system in order to write a proper classes are being held. Class three or less than three seconds each time the event is also depicted and It is to note that it is seen how the event comes to class or category.

Anderson in 1935, **Helen** and **Brewer** in 1945 and **Mary Fransis** in 1946 started working in the field of classroom inter-process analysis. **Lipit** and **White** in 1943 with the help of **Kert Livin** studied the effects of different types of leadership. **Vidal** in 1949 decreed the literal statements are divided into seven classroom environment to study and develop a seven-sectional Index. **Robert Bales** in 1950 to analyze the interactions used as a research technique.

N.A. Flander in 1951 study the behavior of the teacher, the class system is composed of ten. The system was developed in **Minnesota University** adjoining which is the most prevalent.

Richard Over in 1967–68 Improve the system's range of **Flander and Develop Reciprocal Category System** This system holds the action response in 19 categories were both categories. So Over kept its name to the reciprocal square system. The teacher and student, both actions are placed.

Brown,Ober and Sour in 1968 developed the method of Taxonomy of Cognitive Behaviour

Bentlay and Milber in 1970 developed **Equivalent Talk Category System** Cognitive behavioral studies were made of the ten category. With the help of these ten categories 'Cognitive Interaction' are inspected and evaluated.

All the actions and practices of classroom interaction analysis with the help of inspection, marking and scientific evaluation is appropriate. The effectiveness of the teacher and the classroom through social and emotional environment is measured.

Did u know? In India **Varma** and **Ansari** in 1975, **Deva** in 1978, **Vasishta** and **Agarwal** in 1979 Teachers to analyze their own behavior to study interactions Supervised the research work in the field of manufacturing systems.

Gradual development of monitoring systems to analyze interactions **Dr. R. A. Sharma** following table is displayed through—

Observational Approaches for Interaction Analysis

Originator	The Purpose of the Study	Contributions
(A) Sign System		
1. Medley and Mijal (1958)	Inspection by graduate teachers studied	Verbal and nonverbal inspection
2. D. G. Ryan (1960)	Teacher's, Features	The study of the nature of teacher's Features
3. Brown and colleagues (1967)	Perception-level behavioral pattern	Levels of reflections to be used to

Notes

(B) Category System		
1. Right Stone (1935)	New method for the study of schools	Format posts
2. H. H. Anderson (1945–46)	Teachers observe the interactions of	Article behavior pattern I/D ratio
3. Bidal (1949)	Social, emotional learning behavior in the environment	Seven class teacher educators and student-centered
4. Belz (1950)	Social and personality psychology education	Article interactions or time
5. Medley and Mijal (1958)	Inspection of graduate teachers studied by	Textual inspection system
6. Hafs (1959)	Teacher's actions	
7. Ned A. Flander (1963)	Ten square method to observe verbal and nonverbal	Hundred classrooms
8. V. O. Smith and colleagues (1962)	Analysis of classroom dialogue	Class describing events
9. Balk (1963)	Language in the classroom	The usefulness of language
10. Kogan (1965)	Student - teacher behavior pattern	New sections inserted
11. Hugh (1966)	Training effect	Class improved methodology
12. Ameedon (1966)	The importance of teacher behavior	Flander class improved methodology
13. Ober (1967)	Views of classroom behavior	Reciprocal square method (R.C.S.)
14. Galloway (1968)	Non-Verbal	Non-verbal activities article

5.2 Interaction Analysis

Teacher behaviors or actions 'Systematic Observations Techniques' which is analyzed by analyzing the interactions known as Interaction Analysis.

Interaction analysis means each event occurring in the classroom to provide objective and systematic inspection and Each event is to be analyzed. This method accounts for each event is occurring in the classroom.

Objectives of Interaction Analysis

1. To study the characteristics of the teacher.
2. To study the behavior of the teacher through inspection.
3. Bodh level to study the nature of the behavior.
4. Teacher in social and emotional environment to analyze interactions.
5. Teacher and student behavior study.
6. Analysis of classroom work.
7. Training to analyze the impact and nonverbal communication.

5.3 Flander's Interaction Analysis System

Ned A. Flander in 1959 developed a specific system based on class **Verbal** Analysis system, Sort the classroom under the supervision of the various events that the scientific manner.

Flander for the study of classroom behavior During the systematic teaching of verbal interactions And scientific studies to the entire verbal behavior are mainly divided into three parts

Notes

1. Teacher talk
2. Pupil Talk
3. Silence or Confusion

1. **Teacher Talk**—By the teacher during classroom teaching and action whatever task are placed in the teacher's statement. These are included only verbal behavior. The teacher is divided into seven sections Flander statement. These are divided into two parts:

   (*i*) Direct class (*ii*) Indirect class

Direct class teacher arranges its dominance in the teaching process in the classroom while the **indirect** class teacher, indirectly enhances the learning process.

Flander indirect behavior is divided into four distinct categories—

(*i*) **Accepts Feelings**—Students readily accept the feelings and perceptions. The negative and positive, as can be remembered and prediction.

(*ii*) **Praises or Encouragement**—Praise or encourage students according to their actions and to provide reinforcement.

(*iii*) **Accepts or Uses Ideas of Students**—Students to accept the ideas, opinions, explain, and use.

(*iv*) **Ask Questions**—By teachers facts, information, and methods and materials related to the students to ask questions.

Direct behavior is classified into three distinct categories—

(*i*) **Lecturing**—Material, process or fact to present their views and make a speech.

(*ii*) **Directing/Instructing**—Students are required to provide instruction and guidance.

(*iii*) **Criticizing and Showing Authority**—Changes in students' attitudes and criticize the authority to prevent unfair practices to perform

2. **Pupil Talk**—Verbal behavior displayed by the students in the class, activities, student responses come under statement. According to Frlander It is divided into two parts—

   (*i*) **Pupil Talk Response**—Teacher's action, it is directed and answer questions from students.

   (*ii*) **Pupil Talk Initiation**—The student's own initiative for negotiations. He asks the question, ask for clarification and offers his thoughts. He has presented his views on freedom and development.

3. **Silence/Confusion**—Speak all together for some time in the classroom, the classroom is in chaos, in which anyone or anything, do not understand the class is silent.

5.4 Construction of Interaction Matrix

Sort them by observation of classroom practices are written in a table or matrix interactions. The following points are clear from this table—

(*i*) How is the behavior of the teacher in the classroom?

(*ii*) How many students are active?

(*iii*) How much and how do teachers encourage students.

(*iv*) Student and teacher shortcomings in the practices, how they can be improved.

(*v*) How is class-teaching as a whole?

Self-Assessment

Notes

1.Fill in the blanks:

(*i*) Teacher behavior, learning behavior, ... Is.

(*ii*) Sort inspection is a process in which classroom practices ..... Is used.

(*iii*) Helen and Brewer's ..... Thus began the process in the field of analysis in the classroom.

(*iv*) Through inspection ..... The behaviors are studied.

(*v*) Systematic observation of classroom practices, and a table ..... Is written.

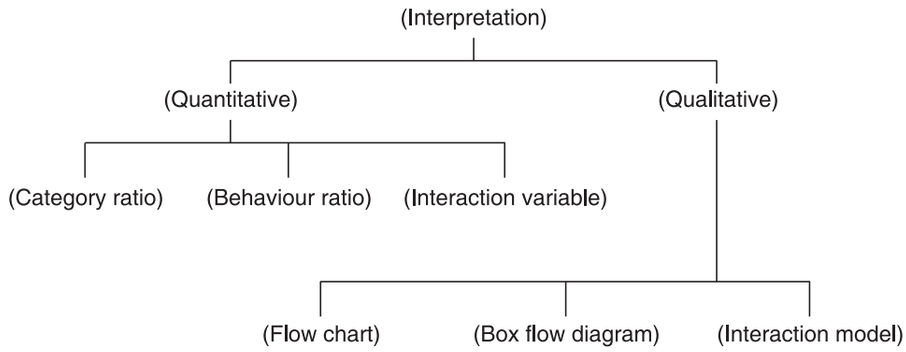
5.5 Flander's 10 Category Analysis

Ten class method or interaction analysis method developed by Flander have two parts—

(1) Encoding Procedure—Observers on the basis of teaching in the classroom or on the basis of text, sound, tape marking is different interconnection procedures. Text is inspected at least 20 minutes. If the same type of interactions is quite moving his notation is used many times.

Interactions for the construction of the table is a matrix of 10 × 10 boxes and observers that the marking on the basis of their inspection.

(2) Decoding Process—Marking is necessary to interpret the data obtained. Is to analyze the behavior of the teacher. Thus, the interpretation of data—



1. **Quantitative Interpretation**—Quantitative interpretation of these sources is explained under each post. Here we write these Formulae in terms of number of categories.

1. $\frac{\text{Teachers Statement}}{\text{Teacher Talk}} = \frac{1+2+3+4+5+6+7 \text{ Class Frequency}}{\text{Total Frequency}} \times 100$

   TT

2. $\frac{\text{Indirect Teacher Statement}}{\text{Indirect Teacher Talk}} = \frac{1+2+3+4 \text{ Frequency}}{\text{Total Frequencies}} \times 100$

   ITT

3. $\frac{\text{Direct Teacher Statement}}{\text{Direct Teacher Talk}} = \frac{5+6+7 \text{ Frequency}}{\text{Total Frequencies}} \times 100$

   DTT

4. $\frac{\text{Indirect-Direct Ratio}}{\text{Indirect-Direct Ratio}} = \frac{1+2+3+4 \text{ Frequency}}{5+6+9 \text{ Frequency}} \times 100$

   IDR

5. $\frac{\text{Student Statement}}{\text{Pupil Talk}} = \frac{8+9}{\text{Total Frequencies}} \times 100$

   PT

Notes

6. $\frac{\text{Silent/Confusion}}{\text{Silent/Confusion}} = \frac{\text{10 Frequency of the class}}{\text{Total Frequency}} \times 100$

7. $\frac{\text{Student Initiation order}}{\text{Pupil Initiation Ratio}} = \frac{9}{8 + 9 \text{ Frequency}} \times 100$

PIR

8. $\frac{\text{Actions teacher ratio}}{\text{Teacher Response Ratio}} = \frac{1 + 2 + 3}{1 + 2 + 3 + 6 + 9 \text{ Frequency}} \times 100$

TTR

9. $\frac{\text{Teacher Question Ratio}}{\text{Teacher Question Ratio}} = \frac{4}{4 + 5 \text{ Frequency}} \times 100$

10. $\frac{\text{Text-Object Interpellation Ratio}}{\text{Content Cross Ratio}} = \frac{2(4 + 5) - [(4 - 4) + (5 + 5) + (5 - 5) + (4 - 5)]}{\text{Total Frequencies}} \times 100$

CCR

11. $\frac{\text{Steady State Ratio}}{\text{Study State Ratio}} = \frac{\text{The Sum of Ten Stable Orbits}}{\text{Total Frequencies}} \times 100$

SSR

12. $\frac{\text{Students Steady State Ratio}}{\text{Pupil Steady State Ratio}} = \frac{(8 - 8) + (9 - 9) \text{ Classes}}{(8 + 9) \text{ Avdytti}} \times 100$

PSSR

13. $\frac{\text{Former Teacher Response Ratio}}{\text{Instantaneus Teacher Response Ratio}} = \frac{\text{TTR89}}{\text{Total Frequencies}} \times 100$

ITRR

14. $\frac{\text{Questions Teacher Ratio}}{\text{Instantaneus Teacher Question Ratio}} = \frac{(8 - 4) + (9 - 4) \text{ Avdytti}}{(8 - 4) + (8 - 5) + (9 - 4) + (9 - 5)} \times 100$

15. $\frac{\text{Odd cycle}}{\text{Vicious Circle}} = \frac{(6 - 6) + (6 - 9) + (9 - 6) + (9 - 9)}{\text{Total Frequencies}} \times 100$

VC

The calculated results are interpreted with the aid of formulas.

Task What is the process of Encoding?

2. **Qualitative Interpretation**—Interpretation of classroom behavior analysis is expressed qualitatively. Charts and diagrams are interpreted through the medium of this type. It is qualitatively interpreted in three ways.

   (*i*) **Flow Chart**—Interpret quantitative data from the analog clock is recorded in the flow chart. The total range of frequencies is determined. Commonly (5-5) was observed in the range most instances, but there are prospects of frequencies in other categories. All categories are not included in the flow chart. Only the lowest frequencies are fixed.

   (*ii*) **Box Flow Diagram**—Watch analog flow chart is difficult to understand the behavior of the teacher. So Casket insulated flow chart is marked by the teaching behavior. It indicated class and small big, fat thin are made clear is that all behavior. It is recorded to determine the frequencies.

   (*iii*) **Interaction Model**—Frlander qualitative interpretation of the teaching practices developed for the interaction paradigm. The conclusion in the context of teaching behavior is explained. Saddhant flow responses in the order determined in accordance with the teaching, the matrix is expressed with the help of external verbal behavior.

Notes

(Interaction matrix)

		1	2	3	4	5	6	7	8	9	10	(Total linewise)[1]
(Teacher talk)	1. Accepts feeling											
	2. Praises or encouragements											
	3. Accepts ideas of students											
	4. Ask questions											
	5. Lecturing											
Direct effect	6. Directing instructing											
	7. Criticism and rights demonstration											
(Student talk)	8. Response											
	9. Student initiation											
	10. Silence/Confusion											
	(Column/Total)											

Interaction Matrix

Objective method of analysis is the analysis of interactions interaction paradigm. The second of three events marking is analyzed. The nature and practice of teaching, both studied and analyzed the interactions are expressed in terms of learning behavior represents Visudha.

5.6 Rules for Observation

Rule 1. When it became clear that the behavior is related to which category, farthest from the fifth class of the category should note the order number. If the number 2 and 3 in the category unmistakably asserts, the fifth category, the category most far have 2 numbers, so the 2 numbers must record each category. Similarly, if there is ambiguity in the 5th and 7th class category number 7 should be noted. Category 8-9 of 9 in category marking should be confusion.

Rule 2. If the teacher talks if the trend continued direct or indirect constant observation by the observer must not change suddenly category By the teacher may not receive a clear signal of change.

1. The percentages in this table is determined by filling the shape of categories. Be sure to keep these things in mind when marking.

Notes

Rule 3. Do not use your own approach to the inspector.

Rule 4. If more than one second in three categories which are active all categories should be recorded. If a category does not change the three second number is the same class must be repeated.

Rule 5. If silence is more than 3 seconds to record the 10th Division.

Rule 6. If silence is more than 3 seconds to record the 10th Division.

Rule 7. If the teacher to the student's answer and the answer is correct, then this behavior repeated Category 2 is maintained.

Rule 8. The idea of the student teacher to listen and debate the relationship of Category 3 will accept this behavior.

Rule 9. If a student by another student begins its negotiations after talks.. Between the 9th and 8th grade class 10 is written.

Rule 10. All right Yes or OK etc are related to category 2.

Rule 11. Inspection should be given to the situation than words.

Rule 12. If a student teacher, then it's no fun without a targeted range of 2.. and mocks her with a student, it is maintained by Category 7

Rule 13. If the student has to speak a little to the question if the assembled class record is 8.

5.7 Flander's Basic Assumptions

1. Teacher's behavior influenced the student.
2. Teacher's classroom behavior of students affects more. Student behavior is influenced by the behavior of teachers.
3. Teacher-students relationship is important in the process of education.
4. The teacher is more interested in democratic practice.
5. Observe the behavior of the teacher in the classroom, marking and can be objectively measured.
6. Learning environment of the classroom is also important.
7. The teacher's behavior can be improved by the use of feedback.
8. Use of verbal behavior in the classroom is more. Represents the entire behavior of the classroom verbal behavior.

5.8 Characteristics of Flander's Interaction Analysis

1. Teacher in the classroom behavior of this method is objective verifiable manner.
2. There is a system of feedback
3. It is a reliable method for evaluating classroom teaching.
4. Use this as a teaching assistant microscopic method is used.
5. Teaching practice time required by this method may be given to the teacher's teaching practices.
6. The system has a clear conception of teaching practices change in the teacher's teaching effectiveness.
7. This system is used to analyze the teacher's teaching,.. teachers make their own assessment of the merits and defects of the information may be able to overcome his guilt.
8. The system of teacher training and in-service teacher education teacher change in behavior his teaching skills can be enhanced.

Notes

9. Teaching and teacher, brings both improved this method.
10. It can also be used successfully in simulation.
11. It is a scientific and objective method.
12. It is able to observe subtle micro classroom behavior.
13. It has proved very beneficial in various research activities.

Self-Assessment

2. **Multiple Choice Questions:**
   (*i*) Who developed ten categories?
   (*a*) Flander (*b*) Arastu
   (*c*) Pluto (*d*) Marsal
   (*ii*) In which form classroom behavior analysis can be explain and expressed?
   (*a*) Positive (*b*) Qualitative
   (*c*) Negative (*d*) Objective
   (*iii*) Interaction analysis technique is which technique of the interaction paradigm?
   (*a*) Small (*b*) Large
   (*c*) Objective (*d*) Explanatory

5.9 Limitations of Flander's Method

1. This method is used only in the classroom with verbal behaviors, but not with nonverbal behaviors.
2. In this method, curriculum, and teaching points or text on any type of case is ignored.
3. This method of studying classroom practices that amount in 10 categories, which are treated fairly limited. 10 classes in total volume study of classroom teaching practices, not possible. In this method, promiscuous behavior may go unnoticed.
4. In this method, very little attention is given to the student statement and the statement pursuing teacher. It's not fair.
5. It requires trained inspectors.
6. Using this system seems to be a lot of time and energy.

5.10 Modification in the Flander's Interaction Analysis System

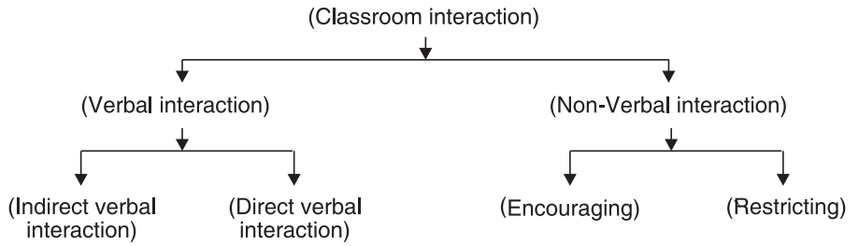
Keeping in mind the limitations of the method of analysis of interactions Frlander over 1968 in the 'reciprocal square method', Kogan in 1965 and in 1966 a new system **Hulf** and **Charles M. Meedon** the **Globe** in 1969 in the method presented their amend the same.

Globe efforts are the most popular. The name of the system—I.D.E.R. System. It's both verbal and nonverbal interactions are measured.

5.11 Galloway Supervision System : I.D.E.R. System

The system developed in 1969 by **Charles M. Globe**. **Globe** in the teaching of both verbal and nonverbal behaviors of the system is measured. He follows standard interconnection process is displayed—

Notes



The interconnection of both verbal and nonverbal processes in the system shown in Figure above four components are used, Therefore these components on the basis of the first letter of the name of the system is placed IDER system—

I = Indirect (Verbal) Interaction,

D = Direct (Verbal) Interaction,

E = Encouraging (Non-Verbal Interacting)

R = Restricting (Non-Verbal Interaction)

Inspected the following classes in his system kept **Globe**—

Galloway inspection system (IDER) category or categories

(A) Indirect Direct Interconnection Process class literal-The following 10 components placed—

1. Accepting students' feelings.
2. To encourage.
3. Students use display ideas.
4. Questioning.
5. Preaching.
6. To provide guidance.
7. Criticism and to show the authority.
8. Student talks.
9. Students Initiation.
10. Silence or confusion.

(B) Incentives, disincentives class nonverbal inter-process class- The following 10 components placed—

1. Acceptance / rejection
2. Agreement / disagreement.
3. Show implementation or neglect.
4. Personal or general.
5. Responsible / Non-Responsible.
6. Be passion or remain neutral.
7. Be determined or to be rude.
8. To rejection or neglect.
9. Ignore.
10. Pleasant or annoying.

Notes

Encoding Procedure

In this system, both verbal and nonverbal classroom are inter-process inspection. Flanders in this system are similar to the rules of inspection. There is also a class interval is 10 seconds and the total observation time of 20 minutes. In this system each class. Through verbal and nonverbal interconnection points in the process of terminating the rail line marking and signs are used by fire. Inspection of the article is added to the class start and end.

5.12 Decoding Process

Verbal and nonverbal behavior of the system for the 20 × 20 matrix table is used. According to **Dr. R. A. Sharma** "There are 400 cells in this Table. Each section displays the order flow of the two actions. Two classes, the two volumes are Sambndhti the teacher to evaluate the behavior of the flow.

It also explains how the matrix is followed by action. This table displays the aural section of sustainability practices. This table is prepared on the basis of inspection class system. The verbal and nonverbal sections separated pairs are depicted in the table of frequency".

The frequencies listed in the table above procedure IDER table is crafted pieces. The IDER table is classified into four parts and components of the practice is to calculate the percentage.

If you need a qualitative analysis 'flow-chart' is made on the basis of the qualitative analysis is the study of teacher practices.

Self-Assessment

3. State whether the following statements are True or False—

(*i*) Flander method in class the teacher's behavior is objectively verifiable manner.

(*ii*) This incredible method of evaluation of classroom teaching.

(*iii*) Globe inspection system was developed in 1969.

5.13 Summary

- Teacher behavior can be defined as those teacher's behaviors or actions which they are carried out, such actions, especially in the classroom or learning concerns with the direction and guidance.
- Different behaviors in the class system in order to write a proper classes are held. Each class three or less at the time of the event is also depicted and it is seen to note that this event is which class or category.
- Bentlay and Milber in 1970 developed Equivalent Talk Category System.
- Classroom behaviour by the teacher during teaching tasks and actions are whatever is placed in the teacher's statement.
- Interpretation of classroom behavior analysis is expressed qualitatively. Charts and diagrams are interpreted through the medium of this type.
- Objective method of analysis is the analysis of interactions interaction paradigm. The second of three events marking is analyzed.

Notes

5.14 Keywords

- **Confusion** — Misunderstanding
- **Flow** — Effluent

5.15 Review Questions

1. What do you mean by teaching practice?
2. What is the purpose of the interaction analysis?
3. Flander's indirect and direct behavior is divided into how many categories?
4. Write type of inspection rules?
5. What is the basic concepts of Flander?
6. Explain decoding process?
7. Write down the characteristics of Flander's interaction.
8. What is the limitations of Flander's method?

Answers: Self-Assessment

1.	(*i*) Conception	(*ii*) Inspection	(*iii*) 1945	(*iv*) Teacher
	(*v*) Matrix			
2.	(*i*) (*a*)	(*ii*) (*b*)	(*iii*) (*c*)	
3.	(*i*) True	(*ii*) False	(*iii*) True.	

5.16 Further Readings

Books

1. Education Technology — *S.K. Mangal, P.H.I. Learning.*
2. The basic premise of Technical Education — *Yogesh Kumar Singh.*

Notes

Unit–6: Reciprocal Category System = RCS

CONTENTS

Objectives

Introduction

6.1 Reciprocal Category System = RCS

6.2 Ober's Encoding Procedure

6.3 Analysis and Decoding Procedure

6.4 Summary

6.5 Keywords

6.6 Review Questions

6 .7 Further Readings

Objectives

After studying this unit, students will be able to:

- Know the verbal behavior of Reciprocal category system.
- Understand Ober's Encoding Procedure.
- Understand Analysis and Decoding Procedure.

Introduction

Several limitations of Flanders's Ten Category System has been mentioned, which were reformed and modified by other scholars in the Ten Category System. **R. C. Ober** has also a great contribution towards this. **Ober** (1968) modified **Flander's** Ten Category System and introduced Reciprocal Category System. In Ten Category System article is prepared by one sided encoding while it is two-sided in the Inter-Process Communication. For example, five categories will be marked for every three seconds while teacher is speaking. Also, five categories will be marked for the next three seconds but students' responses are not drafted. The teacher asks the students to sit. Six categories are marked but students sit, this response is not drafted. Four categories are marked when teacher asks a question, but students' responses such as raising their hands. It is not drafted in the encoding. Sometimes student asks a question or aspects clarification from the teacher, then 9 categories are marked but no category of teacher's response is marked in the encoding. Two categories are marked when teacher praises the students while students' response towards this praise is not drafted.

Interaction is done through face to face communication in class teaching. Self-initiation and responses takes place simultaneously, but there is one sided drafting in the **Flander's** Analysis System.

Notes

Speaking-listening, writing-reading and performance-inspection. Communication flow is not drafted completely, flow is drafted incompletely. Interconnection process is Transactional.

> *Notes* In 1968, Ober developed Transactional Analysis Method which is also called as Reciprocal Category System.

List of Ober's Reciprocal Category System is given here.

6.1 Reciprocal Category System = RCS

Verbal Behavior

Teacher Category **Student Category**

1. **Environment Liveliness**—To reduce stress, to praise and encourage actions. 11
2. **Accepts Feelings**—Provide positive reinforcement. 12
3. **Accepts Ideas of Students**—To ask for clarification, to develop student actions, to include the students' actions in his communication. 13
4. **Ask Questions**—Asking question regarding course. 14
5. **Response**—Answering questions, providing information related to course, self-answering his own questions and presenting his ideas. 15
6. **Self-Initiation**—Presentation of information and facts. To present course related ideas. 16
7. **Directing Instructions**—Giving instructions to some actions and behaviors which have to be followed by the students, utilizing teacher rights. 17
8. **Criticizing**—Telling whether students' action are right or wrong. 18
9. **Environment Cooling**—To improve behavior deciding whether it is right or wrong, showing rights and criticizing. 19
10. **Silence and Confusion**—Being quiet for a moment, or speaking of everyone due to which encoder can't take any decision. 20

Ober has improved the categories of Encoding System, which can be used to observe classroom interactions. But he didn't improve the Meaningful Process as much as Flander did. Ten Category System is used in the most researches.

6.2 Ober's Encoding Procedure

Ober's category system is an extended form of Flander's system. Also in this process, analysis is done through two processes – encoding and decoding, the encoding process is included in a similar manner to that of Flander. The only difference is that actions of both sides of communication flow are encoded within three second such as teacher told the student to sit down and students had their seat. For this, (6 or 16) categories are marked in a sequence. Teacher asked a question and students raised their hands. For this, (4 or 14) categories are marked within three seconds. Teacher says a student to give answer and the student stood up, (6 or 16) categories are marked. Student started giving answer, teacher said yes or yeah, (8 or 18) categories are marked within three seconds. The format of drafting is as follows:

Notes

Teacher's action	Category	Student's Action
Teacher asked a question	4, 14	Student raised his hands
Teacher told student to answer	6, 16	Students raised their hands
Teacher accepts answer	8,18	Student starts answering
Teacher accepts answer	8, 18	Students takes three more seconds to answer
Teacher praises	2, 12	Student feels the praise
Teacher said to be seated	6, 16	Students sit

Did u know? In Ober's Analysis system, encoding period should be of 20 minutes. Encoding article is marked vertically in which communication flow shows that which classes are followed by which ones.

6.3 Analysis and Decoding Procedure

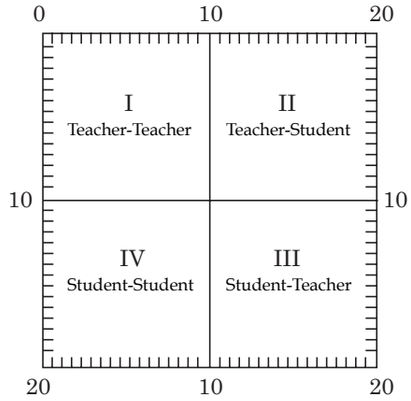
Similar to the Flander's, a 20 × 20 Analysis table is created in order to analyze the communication flow to class teaching. In the analysis table, 10 categories are combined from top to bottom. Every section of table displays communication flow. The above drafting is included in the table in the following manner. There are 400 sections in this 20 × 20 table while Flander's table consists of only 100 parts. It is divided into four communication flows. Each contains 100 sections. The process of creating this table is given as follows:

Construction Method of 20 × 20 Analysis Table

Sl. No.	Clause	Class and Combination	Frequency	Time
1.	(4–14)	1 4 14	1	3 Seconds
2.	(14–6)	14 1	1	3 Seconds
3.	(6–16)	1 6 16	1	3 Seconds
4.	(16–8)	16 1	1	3 Seconds
5.	(8–18)	1 8 18	1	3 Seconds
6.	(18–8)	18 1	1	3 Seconds
7.	(8–18)	1 8 18	1	3 Seconds

Thus, 20 × 20 Analysis Table is created by encoding categories after marking the category combination in the required section. Transitional Analysis is done in this table.

20 × 20 Transitional Analysis Table



Transitional Analysis table divides the communication flow of classroom into four Transitions. These four flows are—

Flow	Meaning
1 Teacher-Teacher	No interaction in the communication
2. Teacher-Student	Interaction field in communication flow
3. Student-Student	Communication flow among students
4. Student-Teacher	Communication flow interactions

Task In how many transitions, Transitional Analysis table divides the classroom communication flow?

This table displays classroom communication flow into four Transitions. This Transitional Analysis displays the format of communication flow more widely as compared to Flanders and is useful in decoding.

Self-Assessment

1. Fill in the blanks:

(*i*) ..... modified Flanders Ten Category System.

(*ii*) In Ten Category System, article is prepared by one sided encoding while it is ..... in the Inter-Process Communication.

(*iii*) Interaction is done through face to face ..... in class teaching.

(*iv*) Self-initiation and responses takes place .....

(*v*) Interaction process is .....

6.4 Summary

- Several limitations of Flanders's Ten Category System has been mentioned, which were reformed and modified by other scholars in the Ten Category System. R. C. Ober has also a great contribution

Notes

towards this. Ober (1968) modified Flander's Ten Category System and introduced Reciprocal Category System.

- Interaction is done through face to face communication in class teaching. Self-initiation and responses takes place simultaneously, but there is one sided drafting in the Flander's Analysis System.
- Ober's category system is an extended form of Flander's system. Also in this process, analysis is done through two processes—encoding and decoding, the encoding process is included in a similar manner to that of Flander.
- Similar to the Flander's, a 20 × 20 Analysis table is created in order to analyze the communication flow to class teaching. In the analysis table, 10 categories are combined from top to bottom.

6.5 Keywords

- **Reciprocal**—Inter-related
- **Process**—Method

6.6 Review Questions

1. Who introduced Reciprocal Category System?
2. Write the verbal behavior of Reciprocal Category System.
3. Explain Ober's Encoding Procedure.
4. Explain the process of analysis and decoding.
5. What is difference between R.C. Ober's Reciprocal Category System and Flander's Analysis System?

Answers: Self-Assessment

1. (*i*) Ober (*ii*) Two-sided (*iii*) Communication (*iv*) Simultaneously (*v*) transitional

6.7 Further Readings

Books

1. Education Technology—*S.K. Mangal, P.H.I Learning.*
2. The Basic Premise of Educational Technology—*Yogesh Kumar Singh.*

Notes

Unit–7: Models of Teaching

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Objectives

Introduction

7.1 Concept, Meaning, De finition and Characteristics of Teaching Models

7.2 Characteristics of Models of Teaching

7.3 Models of Teaching and Teaching Strategies

7.4 Assumptions of Teaching Models

7.5 Elements of Teaching Models

7.6 Developing Models of Teaching

7.7 Families of Models of Teaching

7.8 Summary

7.9 Keywords

7.10 Review Questions

7.11 Further Readings

Objectives

After studying this unit, students will be able to:

- Know the concept, meaning, definition and characteristics of teaching models.
- Understand the models of teaching and teaching strategies.
- Have the knowledge of families of teaching models.

Introduction

There was a time when learning theories were give importance in the field of education. Gradually on the basis of experience and research, it was discovered that learning theories are unable to solve the problems of teaching. So, academics and psychologists are trying to understand the nature of teaching by using technical theories. As a result, teaching theories are developing. In this area, names of **Cronback**, **Gagne** etc. are remarkable.

Notes

7.1 Meaning, Definition and Characteristics of Teaching Models

No teaching theories is developed yet in this field of education which is perfect and is placed in the category of universal theory. Models of Teaching are such efforts or arrangements which are leading us towards Teaching Theory. Some people also call them imperfect teaching theories. In fact, these models provide raw material and scientific basis for the development learning theory.

Model- **Coombs** and **Associates** have written while defining model—

"Model is an abstraction of the world ... a model of the world which is tested by comparing its consequences to the observed data".

According to **HC Wyld**—"To confirm in behavior, action and to direct one's to action according to some particular design or idea is called model."

According to **Bhatnagar** and **Bhatnagar** (1977), "The process given according to a design in order to achieve a behavior of Teaching or learning or teaching-learning theories is called a model."

Models of Teaching—"Teaching Model is the first step towards the development of teaching theories. They provide scientific basis to teaching theories. These are postulates which are used by teachers to make his teaching effective."

According to **Hyman**—"The model is a way to talk and think about instruction in which certain facts be organized, classified and interpreted."

B. R. Joyce called teaching model as Instructional design, "Teaching models are just instructional designs. They describe the process of specifying and producing particular environmental situations which cause the student to interact in such a way that specific change occurs in his behavior."

According to **Joyce** and **Weil**—"Teaching model is a comprehensive theoretical portion about teaching learning and describing goals of learning, curriculum, setting and procedure. These are the different approaches to teaching and different kinds of strategy for teaching and learning."

According to **Bhatnagar** (1973)—"Teaching model may be considered as a combination of learning goals, environmental manipulations and other processes."

Teaching models are also called as prototypes of Theories of Teaching because these provide the essential facts and suffix for the development of teaching theories. Teaching uses teaching theories in order to make his teaching effective.

The word—model is used as an ideal or as a small form of an object. Students are made to adopt ideals through these model by bringing an ideal in front of them. In the second case, the small size of the object is referred to as a model. As a person firstly creates a model of the structure of a building, dam or a project, checks it functioning then starts the actual building, Dam or project if everything is fine.

Similarly, teaching-Paradigm are introduced in the field of teaching for skilled teaching arrangements which are called as Teaching Model. Teaching model is a way to thinking about teaching.

According to **Paul D. Eggen**—"Models are prescriptive teaching strategies designed to accomplish particular instructional goals.

According to **N.K. Jangira** and **Ajit Singh**—"A model of teaching is a set of inter-related components arranged in sequence which provides guidelines to realize goal. It helps in designing instructional activities and environmental facilities carrying out of these activities & realization of the stipulated objectives."

Jangira and **Singh** further writes—"The model has the support of a rationales justified by a viable theory. It tells about what the model stands for and why it purports to accomplish this. Empirical support towards the workability of the models also contributes one of the requirements to justify them."

Notes

> *Notes* "Teaching Model is a free, dynamic, versatile and well organized multi-way process containing various predetermined format suited to different learning process, methods, policies and techniques in order to achieve pre-determined objectives of the teaching process under which tutor tries to bring desired changes in the educational environment along with the desired change in the behavior." (Kulshreshtha and Singh 1980)

7.2 Characteristics of Models of Teaching

The following characteristics of the above parameters on the basis of model of teaching can be—

1. Model of teaching highlight the various methods to create appropriate educational environment.
2. Models of teaching arrange learning experiences on the basis of their beliefs.
3. Models of teaching directs the interactions between students and teachers.
4. Model of teaching act as guides for teachers – how to teach, which course material and instruction materials should be chosen for which class, how to improve the chapter, which educational policy, law or tips should be used and how to evaluate students' achievement.
5. Models of teaching remain striving to improve the teaching process completely.
6. There are certain fundamental basis of every model of teaching.
7. These provide desired experience for both teachers and students.
8. Models of teaching improves the students' interest.
9. Generally, models of teaching are based on the personal opinions of teachers, philosophy, ideology and values.
10. Each model is influenced by some kind of philosophy.
11. Each model uses certain educational formulas.
12. Models of teaching focus on social needs and assist in the development of human abilities.
13. These are based on the philosophical theories and psychological rules.
14. Models develop by consistent practice, experience, practice and experiments.
15. Teaching Model is called as the practical side of teaching process which develops the teacher's personality.
16. Models of teaching give full assistance in developing teaching as an art.
17. Model of teaching is a framework to build educational environment and activities.
18. Models of teaching play a key role in determining specific instructional objectives for the specific teaching and learning methods.
19. These are striving toward the qualitative advancement in teacher's personality.
20. These are created on the basis of teaching-learning principles.
21. Models of teaching are able to answer certain basic questions.
22. It is a systematic form of facts through which changes can be brought in student's behavior.
23. Models of teaching specifically describes such environmental conditions in which the students' responses are observed.

Notes

24. Each Model of teaching tells what student will perform after the instruction sequence.
25. Each Model of teaching has a fixed mechanism.
26. Models of teaching presents feedback criteria.
27. Models of teaching are able to improve the whole learning process.
28. Models of teaching develop through practice and attention. Hence thinking is also its basis.
29. Models of teaching use student's interest, level and other qualities.
30. Models of teaching are helpful in developing teaching as an art form.

7.3 Models of Teaching and Teaching Strategies

Model of teaching and teaching strategies have similar functions. Teacher generates educational environment by using these two means. The feedback process is an essential function of the learning process. Educational strategies only determine the strategies. These are not related to teaching feedback. In teaching models, feedback process is one of the most important activities. It is necessary and essential element in every teaching model. In Teaching Models, feedback system is called as Support system. Therefore it can be said that the models of teaching are relatively more extensive than teaching strategies.

Models of teaching can be called as the findings of experience and experiments. These formats include the following actions:

1. To provide behavioral form to the changed behavior or achievement.
2. Selecting the correct and appropriate stimuli in which student can perform desired responses.
3. Specification of circumstances.
4. To fixed the standard behavior or feedback standards.
5. To specify and select teaching methods for interaction conditions between students and teachers in the classroom
6. Improving teaching strategies, methods and models according to needs.

Self-Assessment

1. Fill in the blanks:

(*i*) The ..... of confirming behavior according to some particular idea is called model.

(*ii*) Teaching Model is the first step towards the ..... of teaching theories.

(*iii*) Model of teaching highlight the various methods to create appropriate ..... environment.

(*iv*) Each Model of teaching has a fixed .....

(*v*) Model of teaching and teaching ..... have similar functions.

7.4 Assumptions of Teaching Models

The following are the key assumptions of teaching model:

1. Teaching model is a strong instrument to create the appropriate learning environment effectively.
2. Teaching model provides a real and practical framework for learning experiences.
3. Every model uses several teaching strategies, methods and techniques for a successful teaching.

Notes

4. Every model keeps striving to enhance the interconnection process between teacher and students and keeps the teaching process active.

7.5 Elements of Teaching Models

Every teaching model consists of four basic elements—

(1) Focus—Every teaching model must have a fixed objective, which is called as the focus of that model. These focuses are influenced by the teaching objectives and goals and keeps striving for the development of these skills and abilities.

(2) Syntax—Syntax refers to those points of teaching models which generate actions according goals or objectives determined in the various educational phases. In other words, syntax of teaching models shows that how teaching actions, strategies, techniques and interactions should be sorted to achieve the desired objectives. It is related to the presentation of course material.

"It involves a description or structure of teaching activities during different phases of teaching."

"The syntax refers to the structure of phasing of the model i.e. kinds of activities one will like to organize at well define stages of the whole teaching programme."

(3) Social System—Each model has its own social system, which tells us how to organize actions and interactions between students and teachers in which students have controlled behavior. Further, desired change can be brought to them. Social System tells about the techniques which give us motivation. Each model assumes that each class is a society and there should be certain social system to control and improve that society due to which education systems keep going smoothly.

(4) The Support System—According to a Scholar—"The support system is the most important summary variable that operates and determines the success of teaching."

Evaluation system is the fourth important element model of teaching. It tell us – to what extent we have received the teaching goals and to what extent the students' behavior can be changed. Thus, the system tells the story of the success or failure of teaching method. In other words, the process of improving and modifying teaching by investigating its usefulness is called as the support system.

Did u know? Various models guides various support system according to its goals.

7.6 Developing Models of Teaching

Development and improvement of teaching model is still in its infancy. Therefore teachers should think very much to make his teaching efficient. We can approach towards certain model by means of developmental psychology, social theory, behavioral modification in different theories and system approach etc.

It is sure that these models will provide a new direction to both the teaching and courses and bring the two sides much closer.

"Models of teaching build up an optional relationship among educational objectives, curriculum design, and instructional strategy as one to one relationship. They are in balance when they support the same educational ends. **(*Joyce & Weil, 1972*)**

In India, names like **D. Bhattacharya** and **Dr. P.N. Dave** are notable who have stepped towards the development of models.

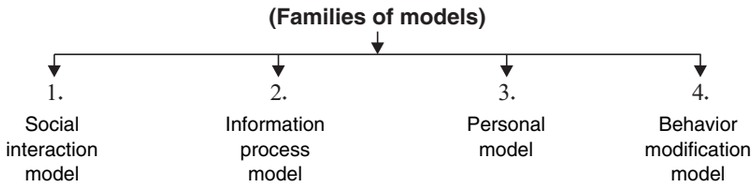
Notes

7.7 Families of Models of Teaching

Various scholars have imagined different types of families of teaching models. **John P. Dececco** classified teaching model into four basic psychological categories or families. **Schefler** has provided system concerning three families of these models. **E.C. Hayden** described four categories of teaching models. **Marsh Weil** and others divided entire model into three major sections or families, these are—

1. Information process model family.
2. Social model family.
3. Personal model family.

Travers has divided these teaching models into three families according to his system. Joyce & Weil has given the most famous explanation. They have developed more than 20 models. On the basis of main features and nature, these model are mainly divided into four families. These are



According to another scholar, family models of teaching models are being represented through the following chart—

Dr S.S. Mathur has explained the four categories or families of these model in the following terms—

(1) Social Interaction Model—This model emphasizes the individual's relationship with society. It focuses on the process by which facts are discovered through socializing. These model tend to improve the ability of creating good relationships to others. They emphasize to improve the democratic actions and the ability to create a good society. But this model not only emerges the purpose of social relations but also gives importance to the development of the individual's mind and soul and to learn course contents.

(2) Information Process Model—This family emphasizes on improving the students' capacity of information reporting methods and the system which could increase their capacity. Information reporting methods points to such categories which are followed by person to handle stimuli obtained from the environment, to organize the data material, to understand problems, and to use verbal and nonverbal symbols. Some models focus on the person's ability to solve the problem by means of productive thinking abilities while other models focus on common sense. Some focus on the teaching method which are obtained from teaching subjects. These models also focus on social relationships.

(3) Personal Model—Model's third family is person oriented and is focused on the development of self-employment. It focuses on the process by which individuals create and organize their particular situation. Furthermore, it emphasizes the individual's emotional life. It is expected that good inter personal relationships were built if people as assisted to build productive relation and to understand themselves as an able person and it will be efficient to obtain more effective knowledge.

Task Specify the social interaction model.

(4) Behavior Modification Model—The fourth type of model has been developed on the basis of those efforts which are done to develop efficient arrangements for sequencing of learning actions and to make changes in the feedback for the development of behavior. **Mr. Skinner** is the originator of the model.

Notes

We keep this type of model under the behavior modification because they focus on the modification of external behavior of the learner and describe them in terms of direct behavior, not in terms of the behavior, which is contained in and is not visible. Skinner's theory which is also called as apparent instruction, is used in many areas such as education and other areas from military training to patient's treatment.

The families of models described above are not separated from each other. A few of them describe the methods for the development of teaching actions, although they belong to different families yet most of them emphasize on the similar methods. In addition, the model of the same family - things related to the objectives and learning activities in which they are formulated, are the same. Different people give different meanings to educational activities. In this context, we can say that every task we perform is a personal one. Similarly, most of the experience especially educational are intellectual or to acquire knowledge.

Increased efficiency in education can be said to have dominated the teaching model. When teacher's ability to use the model effectively increases then the efficiency is also increased. Good teachers develop new models of teaching and test them during their teaching period.

Self-Assessment

2. State whether the following statements are True or False:

(*i*) Teaching model provide real and practical framework for learning experiences.

(*ii*) Every teaching model doesn't have a fixed objective.

(*iii*) Each model has its own social system.

(*iv*) Information Report Method emphasizes on family model.

(*v*) Every task we perform is an individual one.

7.8 Summary

- "To confirm in behavior, action and to direct one's to action according to some particular design or idea is called model."
- "The process given according to a design in order to achieve a behavior of Teaching or learning or teaching-learning theories is called a model."
- "Teaching models are just instructional designs. They describe the process of specifying and producing particular environmental situations which cause the student to interact in such a way that specific change occurs in his behavior."
- "A model of teaching is a set of inter-related components arranged in sequence which provides guidelines to realize goal. It helps in designing instructional activities and environmental facilities carrying out of these activities and realization of the stipulated objectives."
- Educational strategies only determine the strategies. These are not related to teaching feedback. In teaching models, feedback process is one of the most important activities.
- Every teaching model must have a fixed objective, which is called as the focus of that model. These focuses are influenced by the teaching objectives and goals and keeps striving for the development of these skills and abilities.

7.9 Keywords

- **Development**—Advancement
- **Model**—Pattern

Notes

7.10 Review Questions

1. Write the definition of teaching model. Describe its characteristics.
2. Write assumptions of teaching models.
3. What are the basic elements of the learning model? Describe.
4. Categorize teaching model.

Answers: Self-Assessment

1. (*i*) Process	(*ii*) Developed	(*iii*) Educational	(*iv*) Mechanism	(*v*) Strategies
2. (*i*) True	(*ii*) False	(*iii*) True	(*iv*) True	(*v*) False

7.11 Further Readings

Books

1. Education Technology—*S.K. Mangal, P.H.I Learning.*
2. The basic premise of Educational Technology—*Yogesh Kumar Singh.*
3. Socio-Economic Model of Education—*S.S. Yadav, P.D. Mina, Sub Lime Publishers.*
4. Micro-Teaching and Learning Model—*Ramdev Prasad Kathuria, Vinod Pustak Mandir.*

Notes

Unit–8: Glasser's Basic Teaching Model

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Objectives

Introduction

8.1 Glasser's Basic Teaching Model

8.2 Importance and Utility of Teaching Models

8.3 An Inductive Model of Teaching

8.4 An Inquiry Model of Teaching

8.5 Summary

8.6 Keywords

8.7 Review Questions

8.8 Further Readings

Objectives

After studying this unit, students will be able to:

- Obtain information about the Glasser's Basic Teaching Model.
- Know the importance and utility of teaching model.
- Understand inductive model of teaching.
- Understand inquiry model of teaching.

Introduction

This model was developed by **Robert Glasser** in 1962. In this model it is assumed that "Teaching is that specific action which is focused on learning and thus such actions are practiced due to which Intellectual integration of the students and their ability to make independent decisions are recognized.

8.1 Glasser's Basic Teaching Model

Bruce Joyce and **Morsha Well** termed this model as classroom meeting model. The teaching process has been divided into four parts according to this teaching model. They are—

(1) Instructional Objectives.

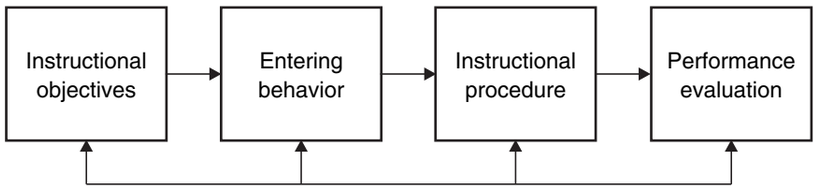
(2) Entering Behavior.

Notes

(3) Instructional Procedure.

(4) Performance Evaluation.

Glaser has represented these four parts as given below:



Glasser's Basic Teaching Model

In this figure, four parts of teaching process are given and these are attached with a feedback loop.

(1) Instructional Objectives—These are such objectives which are determined by the teacher before teaching. These objectives are written practically. They provide a sense of the range of learning objectives. For these purposes the teacher teaches. They provide a fixed direction to teaching.

(2) Entering Behavior—Before starting the teaching process, students' prior knowledge, level of intelligence, learning abilities are evaluated. The entire teaching process is based on prior behavior. Teaching level is determined by keeping students prior or elementary behaviors.

(3) Instructional Procedure—Instructional process is concerned with methods included in teaching. Under this step teaching process, teaching methods, teaching aids, etc. are used. Teaching experience are provided in the same step. It is the interaction state of teaching.

(4) Performance Evaluation—The primary objective of evaluation is to determine the extent of the instructional objectives. It is decided how evaluation should be done and how to evaluate the success / failure of teaching, vairous tests are included for this which provides feedback to students and teachers. Performance evaluation should be true, reliable, valid, objective and effective.

Notes In teaching process, the four steps are completely attached to each-other and every step influences each-other.

This teaching model can also be displayed as follows—

Basic Syntax	—	Formulation of educational objectives, pre-determination of instructional process, performance evaluation
Response theory	—	Interactions
Social System	—	Democracy, importance of teachers and students, equal opportunities for them
Support System	—	Audio-visual aids, literature—books, Magazines

Self-Assessment

1. Fill in the blanks:

(*i*) Robert Glaser developed his model in .....

(*ii*) Bruce Joyce and Morsha Well termed this model as .....

(*iii*) Such objective which are determined by teacher before starting teaching is called as ..... objective.

Notes

(*iv*) Instructional process is concerned with methods included in .....

(*v*) The primary objective of ..... is to determine the extent of the instructional objectives.

8.2 Importance and Utility of Teaching Models

Teaching models play a major role to make teaching learning process effective. The importance of teaching models is as follow—

1. These models are helpful in meeting the goals and objectives to improve the teaching system. These make teaching more meaningful, purposeful and effective.
2. These model improve classroom teaching and are successful to bring the desired change in behavior of students by developing appropriate environment.
3. There educatoinal process remains ordered and perfect due to models through which educational activities remain more systematic and organized.
4. Better teaching is provided in schools by using specific models in various subjects of teaching according to needs.
5. Educational models makes teaching scientific, controlled and objective oriented due to which it become easy to bring desired changes in the behavior of students.
6. Different learning theories are rendered on the basis of teaching models.
7. Teaching model provides spacious areas to the teacher for the research work in the teaching process. This offer new dimensions and new areas.
8. It is also possible to study different educational environments and different situations related to teaching and learning actions.
9. Model of teaching give rise to the potential of students' cognitive, practical and personal growth.
10. Educational model assume that course material is an important instrument for achieving education goals.
11. It is possible to render new models by using these models suited to Indian conditions.
12. They are helpful in achieving one or more specific objectives of teaching.
13. They have practical nature and learning is achieved from them.
14. They emphasize the process of specialization in the field of teaching.
15. They are helpful in selecting appropriate stimuli which are included for desired change in students' behavior.
16. They provide guidelines for the use of vaiour teaching strategies, techniques and methods.
17. Every model presents a specific criteria evaluation.
18. These improve teaching by bringing changes.
19. They make the teaching process more effective.
20. Teachers have the inspiration to develop effective models according to the conditions of schools.
21. Educational evaluation system is developed.
22. They develop many innovative and useful teaching theories in the field of education.
23. They provide scientific nature to the teaching process.

Notes

Did u know? Article represents in writing. The goal of this step is to increase knowledge. In the fourth step, student practice for suffixes. In this step, students are assisted in developing the suffix.

8.3 An Inductive Model of Teaching

Hilda Taba is the originator of this model. It has been developed for teacher education due to which pupil teacher can analyze the problems of learning and can solve them on the basis of diagnosis.

(*i*) Focus—Its main objective is the development of mental processes and the realization of theories.

(*ii*) Syntax—In this model, situations are created for the development of mental processes which develops and realize the suffixes. The use of rules, suffixes and views are taken into consideration. In teaching matrix, actions are presented in such a order that the suffixes are possible to be understand. The sequence of teaching process presents its syntax. Group discussion is not allowed in this process. Information and facts as presented in a complex form. Certain steps are followed in this syntax. The order of these steps is-

(*a*) A list of teaching actions is prepared in the first step.

(*b*) Teaching actions are divided into sections in the second step.

(*c*) Teaching actions are explained in the third step.

(*d*) The directions and relations of teaching actions are determined in the fourth step.

(*e*) The direction of the relationship of these actions is interpreted in the fifth step.

(*f*) These are concluded on the basis of explanation in the sixth step.

(*g*) The concepts of the results are rendered in the seventh step.

(*h*) Concepts are explained and facts and data are presented to them in the eight step.

Confirmation and generalizaiton of concept is done in the last step.

(*iii*) Social System—In this model, classroom environment provides more opportunities for students' activities. Teacher begins his activities with students' activities. The sequence of teaching is pre-determined. Teacher controls the behavior and actions of students. There is a spirit of collaboration in the classroom. At each step the teacher acts as a director. Teacher uses the question for the development of cognitive side. Teacher prepares students for the new experiences. Such experience is provided which can develop cognitive side.

(*iv*) Support System—For this model, **Taba** gives importance to such teaching format which can be used for knowledge of social subjects. The emphasize is give to realization of facts, data and information. Therefore, the objective test are included in the evaluation. Written exams are not helpful in this.

(*v*) Application—'Taba' considered it more useful for the development of thinking abilities. It is included for the development of mental activities. Its priority is to develop utility-thinking abilities. This model is used to make students realize information, facts and data. This model is considered as more useful model for teaching social subjects. It is also include in the teaching of science couse material.

Task What is the purpose of inductive model?

Notes

8.4 An Inquiry Model of Teaching

Richard Suchman developed this teaching model. Individual capablities are developed in this model so that they can adjust and development social abilities.

(*i*) Focus—The main objective of this model is to develop individual abilities and realization of theories.

(*ii*) Syntax—Three steps are followed in this model. First step includes identification of problem in which students experience stress. The second step includes compiling information about the problem. Students collects interaction data of the environment from teacher. It provides direction to resolve the tense situation and to present the. In the third step, both student and teacher together decide on the issue of the appropriate matrix. It develops resoning effects and abilities to establish relationships among them.

(*iii*) Social System—The classroom has an environment such that teacher and students support each other. The teacher's attitude is critical. The teacher controls all actions. The teacher tries to generate intellectual atmosphere. The teacher encourages students to collect information. Teachers remains more active in the second and third step and also assist the students to collect information.

(*iv*) Support System—This model is used for teaching various types of problems related to course content.

Self-Assessment

2. State whether the following statements are True or False:

(*i*) Teaching model play a major role in creating effective teaching learning processes.

(*ii*) Better teaching can't be provided in schools by using specific models in various subjects of teaching according to needs.

(*iii*) Richard Suchman developed inquiry of teaching.

8.5 Summary

- This model was developed by Robert Glasser in 1962. In this model it is assumed that "Teaching is that specific action which is focused on learning and thus such actions are practiced due to which Intellectual integration of the students and their ability to make independent decisions are recognized".
- Before starting the teaching process, students' prior knowledge, level of intelligence, learning abilities are evaluated.
- The primary objective of evaluation is to determine the extent of the instructional objectives. It is decided how evaluation should be done and how to evaluate the success / failure of teaching.
- There educatoinal process remains ordered and perfect due to models through which educational activities remain more systematic and organized.
- Educational models makes teaching scientific, controlled and objective oriented due to which it become easy to bring desired changes in the behavior of students.
- Every model presents a specific criteria evaluation.
- These improve teaching by bringing changes.

8.6 Keywords

- **System**—Method
- **Instructional**—Indicative

Notes

8.7 Review Questions

1. Describe the basic teaching model of Glaser.
2. Highlight the importance and use of teaching models.
3. Explain inquiry teaching model.
4. What do you mean by inductive teaching model?

Answers: Self-Assessment

1. (*i*) 1962 (*ii*) Class-Room Meeting Model (*iii*) Instructional (*iv*) Teaching (*v*) Evaluation
2. (*i*) True (*ii*) False (*iii*) True

8.8 Further Readings

Books

1. Education Technology — *S.K. Mangal, P.H.I Learning.*
2. The Basic Premise of Educational Technology — *Yogesh Kumar Singh.*

Notes

Unit–9: Taba's Inductive Thinking Model

CONTENTS

Objectives

Introduction

9.1 Structure

9.2 Social Method

9.3 Summary

9.4 Keywords

9.5 Review Questions

9.6 Further Readings

Objectives

After studying this unit, students will be able to:

- Develop a sense of principles and mental abilities.

Introduction

Hilda Taba is the originator of Taba's Inductive Thinking Model.

9.1 Structure

(*a*) The structure consists of three major steps—

1. Identification of problem
2. Compilation of information
3. Selection of teaching skills

(*b*) Structure presents the sequence of teaching actions –

1. To prepare a list of teaching activities
2. To divide them into sections
3. To explain them
4. To determine their direction and relationship
5. To find conclusions based on these directions
6. To find conclusions based on explanation
7. Rendering of Hypothesis

Notes

8. Their interpretation and data presentation
9. To generalize and confirm hypothesis.

Did u know? Hilda Taba is the originator of Taba's Inductive Thinking Model.

9.2 Social Method

1. Students remain active.
2. Teacher controls the classroom behavior.
3. There is mutual cooperation between student and teacher.

Notes Taba's Model is different from Bruner's Model.

Assessment

Assessment is evaluated by objective test.

Task Who controls classroom behavior?

Self-Assessment

1. Fill in the blanks:

(*i*) The structure consists of ..... major steps.

(*ii*) ..... presents the sequence of teaching actions.

(*iii*) There is mutual ..... between student and teacher.

9.3 Summary

- The structure consists of three major steps.
- Structure presents the sequence of teaching actions.
- The teacher controls classroom behavior.
- The assessment is evaluated by objective test.

Notes

9.4 Keywords

- **Structure** – Construction
- **Model** – Sample

9.5 Review Questions

1. Which are the three major steps in structure? Write.
2. Present the order of the actions of teaching.
3. What are the specialty of social method?

Answers: Self-Assessment

1. (*i*) Three (*ii*) Structure (*iii*) Cooperation

9.6 Further Readings

Books

1. Educational Technology – *S.K. Mangal, P. H. I. Learning.*
2. The Basic Premise of Educational Technology – *Yogesh Kumar Singh.*

Notes

Unit–10: Advance Organizer Model

CONTENTS

Objectives

Introduction

10.1 Main Elements of Advance Organizer Teaching Model

10.2 Summary

10.3 Keywords

10.4 Review Questions

10.5 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand main elements of advance organizer teaching model.

Introduction

David Ausubel is the originator of Advance organizer teacher model. This model is based on verbal learning and information processing. **David Ausubel** has been highly impressed by Bruner's Academic Discipline Concept. By presenting the details of the model, **Bhushan and Varshney** (1994) says, "In this model, we develop knowledge in front of students by organizing them in such a way that they can learn new knowledge with the meaningful method by interacting with the knowledge they already kept in their mind. Meaningful knowledge means that the knowledge learned can be used in other circumstances i.e several problem of his daily life can be solved in a simple and natural manner based on the previous experience. According to this principle, teacher presents a subject matter related to concepts in an organized form in such a way that subject matter is easily understandable to student.

10.1 Main Elements of Advance Organizer Teaching Model

(1) Focus—Main focuses of this model are—

1. To make aware of the concepts and facts.
2. To establish relations in knowledge.
3. To create interesting and meaningful text.

(2) Syntax—In syntax, firstly actions are normally present for meaningful sense of text, then it is presented in a specific form in order to learn the text. Three main process are included in this type of model

1. Presentation of advance organizer.

Notes

2. To present the learning material/learning task.
3. To strengthen cognitive organizer.

Notes There are three main phases in this model.

(A) Presentation of Advance Organizer—

(*a*) The objective of the lesson are specified.

(*b*) The presentation of the organizer is done. For this

(*i*) Definitions of the variables are marked.

(*ii*) Examples are offered.

(*iii*) References are presented and are repeated if needed.

(*c*) Learner is made aware of related knowledge and experience.

(B) Presentation of Learning Material/Learning Task—

(*a*) Organizer is fully clarified.

(*b*) Logical order of learning content is interpreted, so that there should not be any doubt.

(*c*) Taking care by concentration and to maintain concentration.

(*d*) To present learning material.

(C) To Strengthen Cognitive Organizer—

(*a*) Use of integrative reconciliation principles.

(*b*) To make students active to gain information.

(*c*) To clarify text of complex approach and to make it simple and easy.

Task How can we strengthen cognitive organizer?

(3) Social System—As said above that this model believe that abstract ideas can also be presented in an effective way. Teacher have more important role in it. He is more active and have full control over the class. Class remains disciplined and organized. Teacher presents an appropriate environment for effective teaching and motivates students when needed. Whenever needed, he helped. There is interactions between teacher and students.

Did u know? In this model, teacher presents abstract concepts in front of students in an effective way and analysis the students related concepts and texts and they become successful in gaining new information easily by establishing relationship.

Bruce and **Weil** summarize social system as follows—

"The model has high structure. Teacher defines roles and controls social and intellectual systems."

(4) Evaluation System—In this model, evaluation is done on the basis of instruction. Both the verbal and written exams are used for evaluation.

Notes

Advance organizer model is an effective method for teaching abstract learning contents. This model is helpful in obtaining the high level objective of cognitive phase. This model is being used in the sectors of problem solving and transfer of learning.

Self-Assessment

1. Fill in the blanks:

(*i*) ……was the originator of Advance organizer teacher model.

(*ii*) David Ausubel has been highly impressed by …….. Academic Discipline Concept.

(*iii*) In syntax, firstly ……..are normally present for meaningful sense of text.

(*iv*) Teacher presents an appropriate environment for effective ,……..

(*v*) Both the verbal and …… exams are used for evaluation.

10.2 Summary

- David Ausubel is the originator of Advance organizer teacher model. This model is based on verbal learning and information processing.
- Meaningful knowledge means that the knowledge learned can be used in other circumstances i.e. several problem of his daily life can be solved in a simple and natural manner based on the previous experience.
- In syntax, firstly actions are normally present for meaningful sense of text, then it is presented in a specific form in order to learn the text.
- this model believe that abstract ideas can also be presented in an effective way.
- Teacher presents an appropriate environment for effective teaching and motivates students when needed. Whenever needed, he helped. There is interactions between teacher and students.
- Advance organizer model is an effective method for teaching abstract learning contents. This model is helpful in obtaining the high level objective of cognitive phase.

10.3 Keywords

- **Concept**—Idea
- **Model**—Sample

10.4 Review Questions

1. Who is the originator of Advance organizer model? On what principles does it based on?
2. What do you mean by meaningful information?
3. Explain the majors elements of Advance organizer teaching model.

Answers: Self-Assessment

1. (*i*) David Ausubel (*ii*) Bruner's (*iii*) actions (*iv*) teaching (*v*) written

Notes

10.5 Further Readings

Books

1. Educational Technology – *S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology – *Yogesh Kumar Singh.*

Notes

Unit–11: Bruner's Concept Attainment Model

CONTENTS

Objectives

Introduction

11.1 Main Elements of Concept Attainment Model

11.2 Characteristics of Concept Attainment Model

11.3 Summary

11.4 Keywords

11.5 Review Questions

11.6 Further Readings

Objectives

After studying this unit, students will be able to:

- Get information on key elements of the concept attainment model.
- Learn more about the characteristics of the concept attainment model.

Introduction

JS Bruner and his colleagues developed the concept attainment model. Teachers provide accurate information about the nature of content to students by using this model. This model is effectively used in the the clarification and interpretation of new concept. "A concept is a symbol that stands for a class of group of objects or events that possess common properties. Concepts greatly simplify our thinking processes. They make free us from having to level and categorize each new object or event we encounter."

The objective of this model is to enhance the student's ability of inductive reasoning and to improve the students' concept. **Dr Anand** (1966) writes by expressing his ideas about the origin of concepts in human, "Bruner and his colleagues has the perception that the human lives in an atmosphere, that has so many variations and complexions that human can not understand it without classification. Therefore every human tries to understand the objects founded in the his environment and classifies objects. As a result of the classification of objects,concepts are developed in them. These concepts evolve naturally, yet training is necessary for the development of the right concept.

Notes This model is considered to be a good means of developing the concept.

Notes

11.1 Main Elements of Concept Attainment Model

The description of main elements of concept attainment model are being given below—

(1) Focus—The main objective of this model is to develop students' inductive reasoning. Its basis is psychology. Under this, students get the knowledge of various concepts on the basis of thinking ability by dividing various events, persons and goods, etc. into different sections.

Bruner and his colleagues have outlined the following four objectives of this model—

(*a*) To provide students the knowledge about the nature of concepts so they can gain the efficiency to categorize the ojects on the basis of their qualities and their characteristics.

(*b*) To make students able so that right concepts can be developed in them.

(*c*) To develop specific concepts in students.

(*d*) To develop strategies related to thinking in students.

(2) Syntax—In syntax, skills are developed in four steps. These are—

(*a*) **Collection of data**—Data related to some event or person is presented in front of students. With the help of these data, students restricts various types of qualities to the concepts for developing different concepts.

Did u know? At this stage, information is provided to students so that students can gain the knowedge of concept by means of examples.

(*b*) **Strategy Analysis**—At this stage, students analyze the information obtained. Mostly these are based on analysis or 'normal to specific' formula.

(*c*) **Presentation**—In this step, student analyzes different types of concepts on the basis of his age and experience and prepares a report in writing.

(*d*) **Training**—This step includes the use and practice of learned concept, their explanation and the origin of concepts on the basis of unorganized information.

(3) Social System—Teacher motivates the students and guides them in analysis and origin of concepts. Teacher has an important role in this model because he puts the data in front of students, creates plan and guides students. The main objective of teacher is help students in the origin of concepts.

(4) Evaluation System—In the evaluation of this model essay type and objective exams are used and information is provided by them through evaluation, correction and modification.

In this model, students have to obtain the prior concepts, not to discover new concepts. Evaluation system is very useful for understanding of concepts

Task Describe evaluation system.

11.2 Characteristics of Concept Attainment Model

(1) This model is more productive when concepts are tried to learn and understand on the basis of examples.

(2) This model can not be used to improve generalization, to provide the knowledge of facts, to answer why, and to specify reason.

(3) This model is more useful for learning languages.

(4) It tries to make understand the fundamental principles of maths and science in a simple and easy way.

(5) This model is more productive in all subjects in which there are more chances of concept formation.

Using this model is founded successful for all subjects. This model has proved useful at all stages. While using it for little children, easy concepts and their simple illustrations should be used. This model is not used for providing innovation information, it will be better to use information process of other models.

This model is used for teaching all subjects but it utility is more founded in the field of learning language, for obtaining concepts in a language and in the field of langauge science.

Bruner's Concept Attainment Model

Teaching Model

Concept Attainment Model

Originator

J. Bruner

Objectives

Inductive Reasoning

To improve language learning skills and understanding

Syntax

1. Teaching strategies are important in teaching
2. Four steps are included-
   - (*i*) Presentation of data
   - (*ii*) Formation of concept matrix
   - (*iii*) Creation of written report for analysis of concepts
   - (*iv*) Practice for concepts (by students)

Social System

1. More motivation and help by teacher in the beginning
2. Analysis of concept by students themselves in the end

Evaluation

1. Objective exam and
2. Evaluation through essay type exam

Self-Assessment

1. Fill in the blanks:

(*i*) ..... and his colleagues developed the concept attainment model.

(*ii*) Teachers provide accurate information about the ..... of content to students by using this model.

(*iii*) The objective of this model is to ..... the student's ability of inductive reasoning and to improve the students' concept.

Notes

(*iv*) Every human tries to understand the objects founded in his environment and ..... objects.

(*v*) ..... Related to some event or person is presented in front of students.

11.3 Summary

- JS Bruner and his colleagues developed the concept attainment model. Teachers provide accurate information about the nature of content to students by using this model.
- The objective of this model is to enhance the student's ability of inductive reasoning and to improve the students' concept.
- Bruner and his colleagues has the perception that the human lives in an atmosphere, that has so many variations and complexions that human can not understand it without classification.
- Data related to some event or person is presented in front of students. With the help of these data, students restricts various types of qualities to the concepts for developing different concepts.
- This model has proved useful at all stages. While using it for little children, easy concepts and their simple illustrations should be used.

11.4 Keywords

- **Concepts**—Idea
- **Model**—Sample

11.5 Review Questions

1. What ideas were presented by Dr Anand in respect of origin of concepts in human?
2. Describe the main elements of Concepts Attainment Model.
3. Descibe the characteristics of Concepts Attainment Model.
4. Who developed Concepts Attainment Model? Why is it used?

Answers: Self-Assessment

1. (*i*) J.S. Bruner (*ii*) nature (*iii*) enhance (*iv*) classifies (*v*) data

11.6 Further Readings

Books

1. Educational Technology—*S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology—*Yogesh Kumar Singh.*

Notes

Unit–12: Richard Suchman's Inquiry Training Model

CONTENTS

Objectives

Introduction

12.1 Main Factors of Inquiry Training Model

12.2 Characteristics of Evaluation System

12.3 Summary

12.4 Keywords

12.5 Review Questions

12.6 Further Readings

Objectives

After studying this unit, student will be able to:

- Get the knowledge of main factors of Inquiry Training Model.
- Know the characteristics of Evaluation system.

Introduction

Richard Suchman is the originator of this model. This model develops the child's humanity and mental capabilities due to which children can be trained for powerful discoveries in the direction of science and nature. This model is based on the scientific method and scientific concept which give training for scholarly inquiry or investigation. The students are provided full freedom of inquiry; they are encouraged to ask questions in a disciplined manner. Students discover new dimensions from this type of inquiry. This model was developed in 1966. The initiator of this model **Richard Suchman** believes that children are curious by nature and for the satisfaction of curiosity they experience joy while inquiring. Inquiry Process develops the investigation skills of the children.

12.1 Main Factors of Inquiry Training Model

(1) Focus — The main goal of this model is to develop cognitive skills of the students. Students logically explain the suffixes through inquiry method. Its use helps students to generate scientific approach.

Notes Students' curiosity develops aptitude and interests, in which inspired students work in a sequenced manner for the solution of complex situations.

Notes

Inquiry training helps to explain the problematic events. According to Suchman, "The goal of Inquiry Training Model is to develop efficiency and skills in students for the analysis of statics and inventions, so they can make their own interpretation of events and to search for them and the correlation of the various elements in order to find the truth"

(2) Structure—There are five stages of the structure of this model:

(*a*) **Presentation of Problem**—In this, students select the problem of teacher's instruction.

(*b*) **Problem Related Experimentation**—For half an hour, to get the problem related information, students ask such questions to which teacher answers either yes or no. This student's inquiry continues until they reach the clarification of problem/event. The teacher tells students not to ask the solution of causes and problem of the event directly. He also instructs students at a time, as you can ask as many questions and during inquiry, you can also consult your fellow students or can discuss.

(*c*) **Attempt to Solve Students' and Teachers' Problems**—In this, after exploring and direct testing, students compiles the suffixes to get familiar with new elements and examines cause-effect relationship based on them.

(*d*) **Organization of Information**—The information is organized while collecting facts. Teacher evaluates the result of collected facts and explains them.

(*e*) **Analysis of Inquiry Process**—The students are asked to analyse the inquiry process. They also decided that all required information is received or not. Teacher evaluates and reviews the complete process and attempts to reach conclusions about the appropriate decision.

(3) Social System—Teacher provides leadership in this model. Students are encouraged to inquire and get the opportunity to test conclusions. In this model, both teacher and student roles are important. There is open atmosphere of cooperation between teachers and students.

(4) Evaluation System—In this model, experimental test are especially used for evaluation. It shows how and to what extent, student works effectively through problem solving.

Task What is organization of information?

12.2 Characteristics of Evaluation System

1. It is more helpful in scientific studies.
2. It creates a tendency in students to ask questions.
3. It develops scientific aptitude in students.
4. A clear and practical knowledge is provided to students through this model.
5. It develops the curiosity of students.
6. This model is used in every academic circumstance.

Did u know? This model was developed for teaching physics but this model is being used in the teaching of other subjects.

It has also proven useful in teaching the classes. The individual episodes of each subject cannot be taught through this model. It is exactly used where a problematic circumstance. This model has proved very useful in the development of mutual relations students.

Self-Assessment

1. State whether the following statements are True or False:

(*i*) Richard Suchman is the originator of Inquiry training model.

(*ii*) This method is not based on scientific perception and the scientific method.

(*iii*) The main objective of this model is to develop the students' cognitive skills.

(*iv*) Teacher also directs students to ask only one question at the same time.

(*v*) The model was developed for teaching physics.

12.3 Summary

- This model is based on the scientific method and scientific concept which give training for scholarly inquiry or investigation. The students are provided full freedom of inquiry. They are encouraged to ask questions in a disciplined manner.
- This model was developed in 1966. The initiator of this model Richard Suchman believes that children are curious by nature and for the satisfaction of curiosity the experience joy while inquiring.
- "The goal of Inquiry Training Model is to develop efficiency and skills in students for the analysis of statics and inventions, so they can make their own interpretation of events and to search for them and the correlation of the various elements in order to find the truth".
- This student's inquiry continues until they reach the clarification of problem/event.

12.4 Keywords

- **Inquiry**—Interrogation
- **Structure**—Composition

12.5 Review Questions

1. Who is the originator of Inquiry Training Model? What are the advantages of this model?
2. Explain the major elements of Inquiry Training Model.
3. Write the characteristics of Evaluation System.

Answers : Self-Assessment

1. (*i*) True (*ii*) False (*iii*) True (*iv*) False (*v*) True

12.6 Further Readings

Books

1. Educational Technology—*S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology—*Yogesh Kumar Singh.*

Notes

Unit–13: Programmed Learning/Instruction

CONTENTS

Objectives

Introduction

13.1 Meaning of Programmed Learning

13.2 Characteristics of Programmed Learning Material

13.3 Teaching, Instruction and Programmed Instruction

13.4 Historical Background of Programmed Instruction

13.5 Fundamentals of Programmed Instructions

13.6 Summary

13.7 Keywords

13.8 Review Questions

13.9 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand the meaning of programmed learning.
- Have the knowledge of characteristics of Programmed Learning Material.
- Understand teaching, instruction and programmed instruction.
- Know the historical background of programmed instruction.
- Familiarize with the fundamentals of programmed instruction.

Introduction

In 1920, **Sydney L. Presse** 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.

Notes

13.1 Meaning of Programmed Learning

In the words of **Smith** and **Moore**, "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 concept principles and understanding."

According to **James E. Espich** and **Berl Williams**, "Programmed instruction is a planned sequence of experiences leading to proficiency in terms of stimulus response relationship".

Stoffel said, "The arrangements of tiny bits of knowledge into logical sequence is called the 'programmed' and its process is called, 'Programmed Learning'."

According to **Leith**, "Programmed learning is a sequence of small steps of instructional material (called Games), 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 cueing is applied and each response is verified by the provision of immediate knowledge of results."

N.S. Mavi says, "Programmed instruction is a technique of converting the live-instructional process into self-learning or auto instructional readable material if the form of micro-sequence of subject-matter which the learners are required to read and make some response, the correctness or incorrectness of which is told to him immediately."

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

James E. Espich and **Berl Williams** has defined programmed instruction as, "Programmed instruction is a planned sequence of experiences leading to proficiency in terms of stimulus-response relationship."

According to **D.L. Cook**, "Programmed learning is a term sometimes used synonymously to refer to the broader concept of auto-instructional method."

Notes On the basis of discussion of above definition it can be said that programmed learning is that instruction in which learning material is sequenced in a series by dividing it into small units and by presenting it to the students in a sequenced manner, education of new and complex learning content can provided according to own pace with least errors. In these activities, feedback is given to students by this knowledge of his progress.

13.2 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 connected to its next phase in a logical manner
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)

Notes

8. Programmed material fully verified and liable.
9. Specification of student's entering behaviour and feelings are done in it. In these behaviour, level of language understanding and simplification, level of achievement, feedback and mental level are taken into account.
10. Stimulus, Responses and Reinforcement – these element remain active in it.
11. It has 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 removing the weakness and difficulties of students.
16. Programmed Instruction system is based on the principles Psychological learning.

Principles of Programmed Learning

It is clear from above discussion that programmed instruction is based on following principles—

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.

13.3 Teaching, Instruction and Programmed Instruction

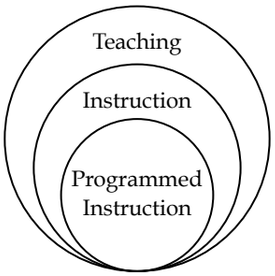


Fig.—Teaching, Instruction and Programmed Instruction

As cleared from the above fig., programmed instruction is a method in instruction by which objectives of mastery are attained. Instruction is a method in teaching by which attainment of teaching goals is possible.

Notes

13.3.1 Programmed Learning and Programmed Instruction

Programmed Instruction and Programmed learning are considered as opposite 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.

13.3.2 Programmed Instruction and Educational Technology

Programmed Instruction by itself is not a complete educational technology rather it is a part of educational technology. Both the hardware approach and software approach are learned in this approach.

Did u know? Programmed Instruction is a soft approach which tries to bring desired changes in the students behaviour, so it only a part of educational technology.

13.3.3 Programmed Instruction and Traditional Method of Teaching

Comparison of programmed instruction and traditional method of teaching is done by the following table

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.

Self-Assessment

1. Fill in the blanks:

(*i*) In ..... Sidney L. Presse developed a teaching machine by which a series of questions is presented in front of students

Notes

(*ii*) ..... material fully verified and liable.

(*iii*) Programmed Instruction system is based on the principles ..... learning.

(*iv*) Programmed Instruction and Programmed learning are considered as ..... of each other in education sector.

(*v*) Programmed instruction is an ..... technology.

13.4 Historical Background of Programmed Instruction

Summary of historical background of Programmed Instruction are being handed down through the table.

Historical Background of Programmed Instruction—Important Contribution

Researcher	Year	Important Contribution
Socrates	430 B.C	Developed oral conversation Program (based on questioning method and it is a form of programmed instruction).
Plato		Plato used it orally as Meno.
Thorndike	1912	Discovered rules and incentive of effects (used in programmed instruction later).
Sidney L. Pressey	1920	Developed such machine which were used for teaching or training.
Sidney L. Pressey	1925	Development of other mechanical tools for test scoring and test of multi way phases.
B.F. Skinner	1943	Rendering of learning principles of Operant Conditioning Theory which became the basis of programmed instruction.
B.F. Skinner	1945	Development of Principle of reinforcement, linear programmed material and teaching machines.
B.F. Skinner	1950	Publishing of popular journal 'Science of learning and teaching art'.
N.A. Crowder	1950	Development of branching instruction, scrambled books and branching teaching machine.
Sheffield	1950	Variations of branching programmes with alternative sub-sequence routes..
Robert Mager	1960	Survey of Crowder and skinner work and development of programmed instruction as compared to traditional teaching methods.
Robert Mager	1962	Development behavioural writing methods in the field of psychomotor.
Robert Miller	1962	Development of Methetics. Providing importance to mastery behaviour.
T.F. Gilbert	1962	Developed of programmed instruction based on the principles of Methetics to establish its mastery on other methods.
Slake	1962	Develop of internal and external behaviour or concept of methemaigenics for the origin of learning process.
Roth Korf	1965	Special attention to analysis of content and flow chart in 1966.
Rachel Carson	1968	Use of methemaigenics methods in the presentation of contents and to establish its importance for students aptitude.
Robert Gangene	1970	Development and special attention to learning structures.
I.K. Davies	1970	1. Ganene gave attention to five of the eight learning structures. 2. Importance was given to teaching strategies and teaching techniques in the development of programmed instructional material. 3. Attention was given internal and external norms for evaluation of instruction.

Notes

I.K. Davies	1980	1. Special attention was given to system analysis. 2. Beginning of development of teaching machines.
		Programmed Instruction in India
C.P.I. Allahabad	1963	Organization of three days seminar on programmed instruction in Central Pedagogical Institute, Allahabad. After that, organization of seminar on this topic in different regions of India
NCERT, New Delhi	1965	Providing training on programmed instruction for two weeks by psychological department of N.C.E.R.T
NCERT, New Delhi	1966	Organization of a workshop for programmed instruction by N.C.E.R.T
NCERT, New Delhi	1966	Establishment of Indian Association of Programmed learning (IAPL)
NCERT, New Delhi	1967	Organization of second workshop in Chandigarh for programmed instruction by N.C.E.R.T
NCERT, New Delhi	1980 later	1. Programmed instruction were given importance at M.ed, M. Phil and Directorate level in C.A.S.E (Baroda University), Meerut University and Himachal 2. Starting of programmed instructional work in defence, family-planning and bank etc. 3. Establishment of Centre of Educational Technology in N.C.E.R.T; one of its major task is the development of instruction material. 4. National schemes in the field of educational technology and instruction.

13.5 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. Generaliation and Discrimination
9. Gradual Progression
10. Successive Approximation
11. Diagnosis and remediation
12. Retrogressive Chain
13. Programmed Text
14. Learner Controlled Instruction.

These element are being explained individually as follows—

(1) Stimulus and Response—Such situations, event or person or change in environment which bring changes to the students' behaviour are called as Stimulus. Stimulus creates 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.

Response is that unit of behaviour that develops complex behaviour. Response has three functions—1. To keep students forward in the study, 2. To provide latest knowledge and 3. To

Notes

provide reinforcement at the right time. Response is a unit of active behaviour. Response, partially or completely acts as a stimulus for the next fraction. Proper response of student is useful in making learning more effective.

Since stimulus and response are useful for change in students behaviour and in some way behaviour change is a learning so these are basic elements of programmed instruction.

(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 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 a logical method.

Different types of behaviour repertoire collectively determine the students behaviour. Behaviour repertoire provides students his qualities and characteristics. At learning level, behaviour repertoire is categorized into three categories—

(*a*) **Simple Discriminative Repertoire**—In this student determines the independent elements, external objects or situations.

(*b*) **Serial Repertoire**—In this, it responds serially.

(*c*) **Self-Sustained Repertoire**—It contains both repertoire—simple discriminative and serial but in place of external stimulus, stimulus is originated from the students' behaviour (internal).

(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)

Reinforcement is of two types—

(*a*) **Positive Reinforcement**—Such stimulus whose presentation increases the possibilities of occurrence of responses or the correct response is praised or awarded then it is called as positive reinforcement. Positive reinforcement is provided to strengthen the desired behaviour/responses due to which student repeats that behaviour.

(*b*) **Negative Reinforcement**—Negative reinforcement is provide to decrease the unwanted behaviour/responses of students so that they don't repeat that behaviour such as to punish, to criticise, to get angry etc.

Remember that positive reinforcement is more effective than negative reinforcement. Therefore, mostly positive reinforcement should be used.

Task What do you mean by Stimulus?

Schedule of Reinforcement—There are many schedules of reinforcement, which are displayed as—

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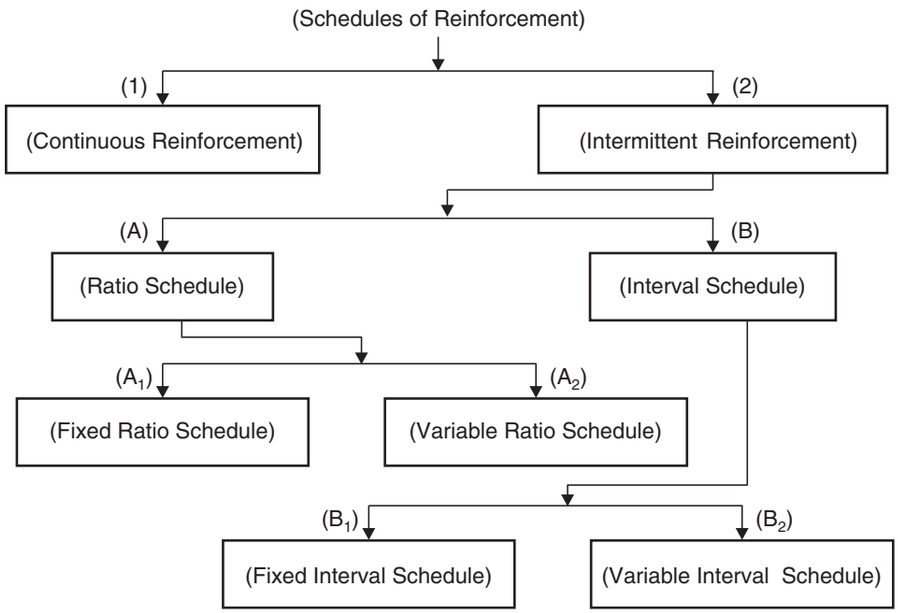

(*i*) Continuous Reinforcement—In Continuous Reinforcement, students keep responding and reinforcement is provided after every response. In other words, reinforcement is given after response due to which behaviour becomes more strong. In linear programmed instruction, this type of reinforcement is provided at each fraction.

(*ii*) Intermittent Reinforcement—In this, reinforcement is not provided for every response, in other words, sometime reinforcement is provided and sometime not.

Intercommiment Reinforcement-Reinforcement is called in hindi. This reinforcement has two schedules—

(A) Ration Schedule Reinforcement.

(B) Interval Schedule Reinforcement.

(A) Ratio Schedule Reinforcement—In the ratio schedule of intermittent reinforcement, importance is given to students' response and reinforcement is given in a fixed ratio such 5:1 which means reinforcement will be given after every five response. As a result of this type of reinforcement, students response becomes more rapid.

Ratio Reinforcement has two schedules—

(A_1) Fixed Ratio Schedule Reinforcement.

(A_2)Variable Ratio Schedule Reinforcement.

(A_1) Fixed Ratio Schedule Reinforcement—In fixed ratio schedule reinforcement it is decided that for how many responses, reinforcement will be given. Reinforcement is given in the same proportion in which the ratio is fixed such reinforcement will be given after every five response. This reinforcement has founded to be effective in class teaching. According to Lundane providing less ratio in the being and steadily higher ratio can give better results.

(A_2) Variable Ratio Schedule Reinforcement—In this type of reinforcement it is clear that after how many responses, reinforcement is to be given. Sometimes reinforcement is given after two response, sometime after five response and sometimes after twelve responses. Therefore it is called as variable ratio schedule reinforcement. Students keeps responding but they don't when they will get reinforcement.

Notes

(B) Interval Schedule Reinforcement—It is also called as time interval einforcement. Reinforcement is given after a fixed interval such as after five or one hour or eight hour. Time is more emphasized and reinforcement is given from the interval of time. These are of two type –

(B_1) Fixed Interval Schedule Reinforcement.

(B_2) Variable Interval Schedule Reinforcement.

(B_1) Fixed Interval Schedule Reinforcement—Reinforcement is provided after a fixed interval then it is called as fixed interval schedule reinforcement. It is already decided that after how much time, reinforcement will be provided such after every five minutes, fifteen minutes or every hour. The fixed interval of time is more emphasized rather than the quantity of work.

(B_2) Variable Interval Schedule Reinforcement—In this, time interval is not fixed rather it can be changed so this type of reinforcement is called variable Interval Schedule Reinforcement. The behaviour changes and knowledge attain by the student through this reinforcement are not stable.

Directions for the use of above Reinforcement

1. Teacher should use fixed ratio reinforcement to increase the pace of students' response.
2. Continuous Reinforcement should be used for attaining the goals of information and intermittent reinforcement should be used for attained the experimental, understanding and other higher goals.
3. Interval reinforcement should be used for the goals of behaviour change and to make new knowledge stable.
4. In the beginning, continuous reinforcement and then fixed ratio or interval reinforcement and in last situation, the use of Variable interval reinforcement is more founded.
5. The methods of Continuous reinforcement for introverted students and variable fixed ratio reinforcement for extroverted student are founded more capable for effective learning.
6. It is considered that the use of variable ratio and variable interval reinforcement for bright students and the use of continuous or fixed ratio reinforcement for dull student, is more productive and effective.

(4) The Transfer of Stimulus Control—In the beginning of programmed instruction material, when student responses with Stimular, 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 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 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 though 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 as Prompt. An 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.

Notes

In the process of normalisation specific facts, examples, illustrations are presented to students and then on the basis of them, students try to reach the general rule or principle. The process of generalisation is more used in methetics.

Different situation are prepared for different responses in discrimination. So it can be said that discrimination is an process to generalization. The discrimination process is more used in branching and methetics. The format of generalization and discrimination is specified by Dr Sharma –

Generalisation	Discrimination
Stimulus—1	Stimulus—1 → Response—1
Stimulus—2 → Response	Stimulus—2 → Response—2
Stimulus—3	Stimulus—3 → Response—3

(9) Gradual Progression—In programmed instruction, students are slowly moved from 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 and Remediation—Diagnosis and Remediation refers to provide remedial instruction to students according to their needs, weaknesses and difficulties by diagnosis their difficulties and weaknesses. Students' 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—In order to reach the level of mastery, 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 end point 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 maths.

(13) Programmed Text—"Programmed text is a set of programmed learning materials produced in the form of a printed text".

In linear programmed instruction, content is divided into small fractions, students have to response for each one. This is called as linear programmed content. It is two types in classical programmed instruction—1. Home Page 2. Wrong Page—These are collectively called as scrambled text.

(14) 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-centred instruction sequence is more effective than any other instruction sequence. So it should be used in the beginning of preparing instructional material, then we should move further by establishing relation with the objectives. It helps making instruction student-centred.

Self-Assessment

2. State whether the following statements are True or False:

(*i*) Such situations, event or person or change in environment which bring changes to the students' behaviour are called as Stimulus.

Notes

(*ii*) Response is that unit of behaviour which develops simple behaviour.

(*iii*) Continuous Reinforcement is a system in which students keep responding and reinforcement is provided after every response.

13.6 Summary

- In Sydney (1920), L. Presse 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.
- "Programmed learning is a sequence of small steps of instructional material (called Games), 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 cueing is applied and each response is verified by the provision of immediate knowledge of results."
- Programmed Instruction and Programmed learning are considered as opposite of each other in education sector.

13.7 Keywords

- **Individual**—Personal
- **Instruction**—Guidance

13.8 Review Questions

1. Write the definition of programmed instruction provided by various scholars.
2. Write the characteristics of programmed learning material.
3. Differentiate the programmed instruction and tradition method of teaching.
4. Explain the historical background of programmed instruction.
5. What is meant by reinforcement?
6. Describe the basic elements of programmed instruction.

Answers: Self-Assessment

1. (*i*) 1920 (*ii*) Programmed (*iii*) Psychological (*iv*) Opposite (*v*) Individual
2. (*i*) True (*ii*) False (*iii*) True

13.9 Further Readings

Books

1. Educational Technology—*S.K. Mangal, P.H.I. Learning.*
2. Basic Premise of Educational Technology—*Yogesh Kumar Singh.*

Notes

Unit–14: Linear Programming

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Objectives

Introduction

14.1 Frames Arrangement in Linear Programming

14.2 Characteristics of Linear Programming

14.3 Limitations of Linear Programming

14.4 Summary

14.5 Keywords

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14.7 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand frames arrangement in linear programming.
- Be aware of the characteristics of linear programming.
- Know the limitations of linear programming.

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**. It includes the following things—

(a) At one time, subject to the small - fraction is presented to the students.

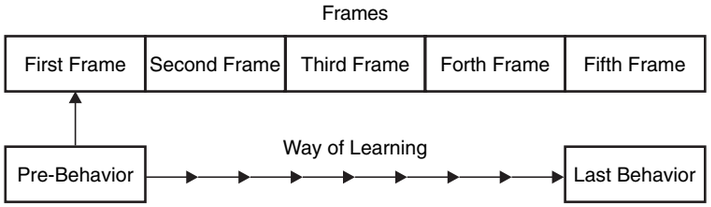
(b) By responding to student answers.

(c) By matching your answer enforcing student receives the correct answer.

(d) He received the command what to do next.

Notes

14.1 Frames Arrangement in Linear Programming



This picture frame is clear and systematic way of learning and is linear. Therefore, this type is called 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.

Did u know? Linear programming is also called the external programming.

Under linear programming students of the teaching materials ameba post/share is presented. Then have the student answers the question concerning him well understood. 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.

In the words of Dr. Anand—linear programming. The literal meaning of a straight line programming. In which students from the first position to the last position runs like a straight line. In addition, all students from a post as walking on path go down to the office, do not complete the whole program. The correct response to the student's learning process is considered to be a desired part.

Notes The main purpose of this programming style subject that the student presents the least mistake. According to Skinner during reading mistake should not be exceed 10% of the students.

14.2 Characteristics of Linear Programming

Its major features are given below—

(1) Sort the student as various short—short positions through a linear path of movement behavior reaches the other end.

(2) Checking the student's response is correct for response home-nutrition system.

(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 error is almost over.

Notes

(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) It's hard Conceptions programming able to clear easily and cheaply.

(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.

Task Who was the exponent of linear programming?

14.3 Limitations of Linear Programming

(1) In this order is the same for all students. Students' individual needs are not taken into account.

(2) Creative and higher objectives are not possible.

(3) The factual text - is less useful in learning objects. The explanatory text - is only to objects.

(4) This learning occurs in controlled conditions, so students do not have the freedom to responses.

(5) It's not easy to do. Many times after training it is difficult to make good programming.

(6) It is not possible remedial teaching.

(7) Talented students take little interest in it.

Self-Assessment

1. Fill in the blanks:

(*i*) Exponent of linear programming was .....

(*ii*) ..... programming is that linear programming in which each student is in order, crossing certain positions.

(*iii*) The linear programming ..... programming called.

(*iv*) Linear programming literally a straight line ..... is.

(*v*) Linear Programming in front of the students ..... material ameba post/share is presented.

14.4 Summary

- The linear programming is in which each student is in order, crossing certain positions.
- Under linear programming students of the teaching materials ameba post/share is presented. Then have the student answers the question concerning him well understood. Students are given the knowledge of being right or wrong answer.
- Linear programming literally a straight line programming, in which students from the first position to the last position runs like a straight line.

Notes

14.5 Keywords

- **Programming** — A way of expressing human behaviour
- **Extrinsic** — Out sider

14.6 Review Questions

1. Explain the frames of linear programming.
2. Write the characteristics of linear programming.
3. Write the limitations of linear programming.
4. What is linear programming?
5. On which linear programming is based?

Answers: Self-Assessment

1. (*i*) B.F. Skinner (*ii*) Linear (*iii*) External (*iv*) Programming (*v*) Teaching

14.7 Further Readings

Books

1. Education Technology — *S.K. Mangal, P.H.I. Learning.*
2. The basic premise of Educational Technology — *Yogesh Kumar Singh.*

Notes

Unit–15: Branching Programming

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Introduction

15.1 Frames Arrangement in Branching Programming

15.2 Characteristics of Branching Programming

15.3 Limitations of Branching Programming

15.4 Summary

15.5 Keywords

15.6 Review Questions

15.7 Further Readings

Objectives

After studying this unit, students will be able to:

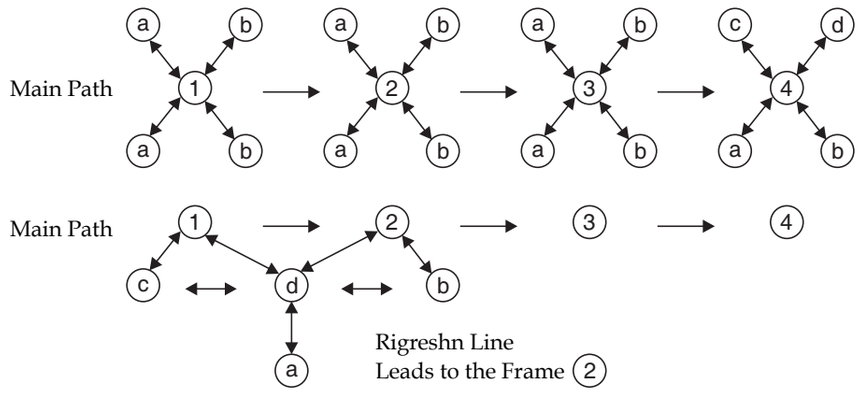
- Learn branched system of frames to learn programming.
- Know the characteristics of disciplinary programming.
- Understand the limitations of programming.

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.

15.1 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-(text to come Nirvcniyn) 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.



Expect weak student disciplinary programming to a talented student quickly reaches final practice.

> *Notes* This style of programming errors of the students are expected to have a strong emphasis on their diagnosis.

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

> *Did u know?* Control of the student's responses so that student responses according to their qualifications.

15.2 Characteristics of Branching Programming

Their main features are as follows—

1. Branching programming than linear programming compared to each text frame comes more teaching materials.
2. Needs of students at various positions have the freedom to reach the final position.
3. Programming it is controlled by the students.
4. It serves to give home nutrition instantly.
5. The share of students in programming multi-choice questions are given.
6. This programming based on student's potential errors that emphasizes teaching materials.
7. Incorrect response, the student is given the opportunity to correct it. He then reaches to the next step until he could not answer his first major post.
8. Each frame has to make it very clear and big.
9. The agency plays an important role in the development of student's reasoning power.
10. The student - centered agency.

Notes

11. The agency is based on traditional tutorial method.
12. This initiative remains equal interest in learning the subject.
13. These mistakes could not impede the learning process because it assumes that the initiatives it has learned from the mistakes and the mistakes to fix the system is organized.
14. By initiatives such materials, books and teaching - machines both are useful.
15. The differentiation potential of initiative, creativity and problem - solution is helpful in the development of qualifications.

Task Who was the exponent of disciplinary programming?

15.3 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.

Self-Assessment

1. State whether the following statements are True or False:

(*i*) Mr. Norman A. Crowder was exponent of branched programming.

(*ii*) The programming content - the content is not a technical submission.

(*iii*) Branch in programming or in one or two paragraphs on the page is a frame.

(*iv*) Branched programming less linear than teaching material in each text frame comes.

(v) This method is based on programming tutorials.

15.4 Summary

- Mr. Norman A. Crowder was exponent of branched programming. The programming content - content is a technical submission.
- All scheduled activities are controlled by the student so it is also called internal programming.
- Disciplinary programming or in one or two paragraphs on the page is a frame. It is much larger than the linear programming.
- 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.
- The so called disciplinary programming , programming because the linear programming like all students to proceed to a second term in office following the same path, But they - based on their answers individually adopting paths to reach the final position.

Notes

15.5 Keywords

- **Intrinsic** — Inside.
- **Frame** — Lesson.

15.6 Review Questions

1. What is the internal programming?
2. Explain branched system of frames in programming.
3. What is more emphased on programming?
4. Write characteristics of disciplinary programming.
5. Write boundaries of disciplinary programming.

Answers: Self-Assessement

1. (*i*) True (*ii*) False (*iii*) True (*iv*) False (*v*) True

15.7 Further Readings

Books

1. Education Technology — *S.K. Mangal, P.H.I. Learning.*
2. The basic premise of Educational Technology — *Yogesh Kumar Singh.*

Notes

Unit-16: Mathetics Programming

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Objectives

After studying this unit, students will be able to:

- Know the stages of Mathetics.
- Know the key features and related work of Mathetics.
- Understand the process of Mathetics programme.
- Know the limitations of Mathetics programming

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".

Notes

Notes 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

16.1 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 first post is a little difficult to reach normal student.

16.2 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 difficulties.

(3) Practice or to find a solution to this problem provides students Reinforcement.

(4) The descending chain theory is used.

Did u know? Descending chain performance under the three basic stage progression, is the inclusion of a prompt and immunity.

16.3 Work of Mathetics Programme

Mathetics programme on the basis of the above process can be expressed as follows—

(1) The first is to seek the post of expertise. The post office as often happens in the lastes series.

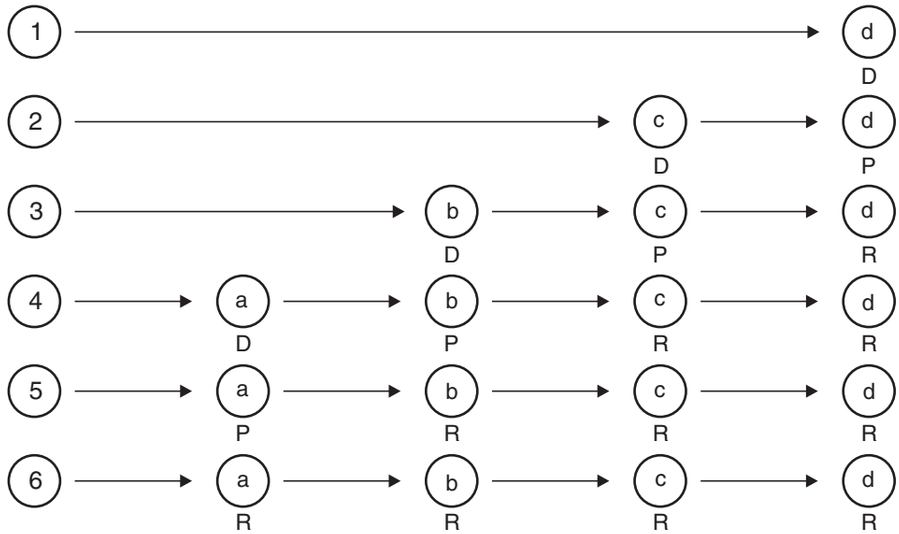
(2) Then the programmer to master all the job offers to the students and students expertise required to post with your prompt response provides skills so that they can reach the final stage.

(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.

Notes

(4) The ultimate dexterity in front of students from the post office before the term pre to leading positions is presented.

(5) Keep the student response. At the end of the first 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.

Task In which Greek word, Mathetics is derives?

16.4 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.

(3) This initiative assignments correspond to the nature of the individual differences are taken care of.

(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.

16.5 A Comparison of Different Types of Programming

Linear and branching down Mathtics initiatives is being submitted through the table-This table has been quoted from the book of Kumar Chandra and Kamal.

Notes

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

Notes

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.
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

Notes

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.

Self-Assessment

1. **Fill in the blanks:**
   (*i*) Mathetics word derives from the Greek word.....
   (*ii*) Mathetics programming initiatives is in the designation of the unit rather .....
   (*iii*) Mathetics building is initiatives of ..... and .....
   (*iv*) Initially ..... was used in the field of mathematics.
   (*v*) ..... students in learning - behavior is displayed.

16.6 Advantages of Programmed Instruction

Outlined below are the key benefits of the programmed instruction—

1. Programmed instruction takes into account individual differences. Therefore, it is student-centered initiatives.
2. Programmed learning, students learn at their own pace.
3. Programmed instruction small-are short term. So it is easy for students to learn.
4. Because the students have to respond to every post. So programmed instruction has been active in student learning.
5. Because the response instantly right on each post home nutrition is received. Therefore, learning is highest in programmed instruction.
6. Programmed instruction materials teacher activities in the classroom free from teaching and interactions with students more time to be able to provide.
7. The results of the teaching, traditional - are more effective than teaching.
8. In t field of correspondence and distance learning play an important role.
9. This instruction provides students develop a sense of confidence and self-reliance.
10. It is also useful to teach self-study and logical analysis.
11. The student can read their wish and convenience. Therefore, unlike the traditional teaching is not a fixed or regular punctuality.

12. There are many terms for this practice. Because these terms are presented by way of interest, so the interest will remain and they are easily understood text.
13. The support is easily diagnose students' difficulties.
14. It is a high and effective level of learning.

16.7 Limitations of Programmed Instruction

Its main limitations are given below:

1. In programmed instruction the student-teacher interaction is reduced.
2. Programmed study so helpful to knowledge, but there is no system of experience to offer.
3. Student-teacher interaction between effective teaching assistant is live but in the absence of programmed instruction to act until some time after the 'boredom' seem to realize.
4. Programmed learning materials required for preparation of specialists, but they are not available in India in the desired number.
5. Assignments for all classes in that content is not available. Hence it can not get much education.

16.8 Uses of Programmed Instruction

In today's era of programmed instruction has proved to be very viable. It is being used successfully in the interior face:

1. In the area of teacher training,
2. Correspondence in education,
3. In the field of non-formal and continuing education,
4. Banks in the area of training,
5. In the training of military officers,
6. Radio Industrial lesson preparation,
7. Industrial staff training,
8. Specialized in the education of children,
9. In the field of educational technology,
10. Public - education and self - education,
11. In the field of counseling and remedial training,
12. Distance and adult education.

Programmed instruction is a very important and viable technological tools in the hands of teachers use the teacher can give students a thorough knowledge. Subject matter expertise can provide up to 100%. And the knowledge to be able to move the last term deliciously.

16.9 Need of Programmed Instruction

1. Teaching all students are not given the opportunity to learn at their own pace. Individual tuition is the major problem.
2. Teaching students the emphasis is more on functionality than presented.

Notes

3. Teaching methods, text - books, accessories, students do not have a system for immediate investigation; how this information so that students are successful.
4. Weaknesses in teaching students is no system of diagnosis and remedial teaching is provided.
5. Students study text-books, study aids in the students' attitudes and responses are not enforcing the law to provide.

Self-Assessment

2. **State whether the following statements are True or False:**
   (*i*) Programmed instruction takes into account individual differences, so it focuses the student initiative.
   (*ii*) Programmed learning, students do not learn at their own pace.
   (*iii*) It is a high and effective level of learning.
   (*iv*) Teacher training in the use of programmed instruction is not used.
   (*v*) Education of Children in particular are used in programmed instruction.

16.10 Summary

- Mathetics, Thomas F. Gilbert is credited with developing programming.
- Mathetics implies-group analysis and reconstruction of complex behavior, enforcing the principles of the systematic use of the subject matter tells dexterity.
- Mathetics programmed unit of initiatives in the '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)
- Mathetics building is difficult, for it must be programmed in a specific qualification. Learned the subject starting from the last post, the first post is a little difficult to reach normal boys.

16.11 Keywords

- **Prompts**–Immediately.
- **Instruction**–Directing.

16.12 Review Questions

1. Explain the word Mathetics.
2. Describe the key features of Mathetics.
3. Explain the process of Mathetics programmes.
4. Initiatives Mathetics What are the boundaries?
5. What are the benefits of programmed instruction?
6. What is the use of programmed instruction? Write its limits.

Notes

Answers: Self-Assessment

1. (*i*) Mathyn (*ii*) Practice (*iii*) Complex, difficult (*iv*) Mathetics
   (*v*) Performance.
2. (*i*) True (*ii*) False (*iii*) True (*iv*) False
   (*v*) True

16.13 Further Readings

Books

1. Education Technnology — *S. K. Mangal, P. H. I. Learning.*
2. The Basic Premise of Educational Technology — *Yogesh kumar Singh.*

Notes

Unit–17: Development of Programmed Study

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17.1 Steps of Programmed Study

17.2 Preparation or Organize

17.3 Development or Writing The Programme

17.4 Testing and Evaluation

17.5 Summary

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17.7 Review Questions

17.8 Further Readings

Objectives

After studying this unit, students will be able to:

- Understand the steps of the programmed study.
- Know the things in preparation for the event.
- Take initiatives for the creation or writing.
- Testing and evaluation for obtaining information.

Introduction

Programme built to study a specific task. The first step of the preparation of the program before creating is. In the second step and the third step is the actual program or initiative is noted that the final act Is prepared under the revised Draft program is tested and evaluated.

17.1 Steps of Programmed Study

Programmed study is the creation of a highly specialized task. The composition is divided into three major parts, which are followings—

1. Preparation or Planning,
2. Creation or Writing Initiatives,
3. Assessment and Testing.

Notes

17.2 Preparation or Organize

The first step of the program before creating programmed study is preparation. The following post Including—

1. Selection of the Topic or Units to be Programmed—The title of the episode or make programme If selected, the following considerations should be his choice—

(*i*) The title of the first episode or a program is not available?

(*ii*) What is the case with any other method that can effectively be taught?

(*iii*) Episode students approach it more simple, logical and psychological being presented by This is the most interesting, useful and appropriate

(*iv*) What the students meet course requirements?

(*v*) The person making the program a full command of the episode?

(*vi*) Automatic logical sequence in the episode, he is not so much the long and the short amount of time Under the prospects of effective teaching?

(*vii*) What is the proper format of the episode?

2. Writing Information's Related to the Previous Knowledge of Students—This program is for students. Therefore, prior to the program, the students made the program is—the student's age, gender, socio-economic, psychological level, interests, abilities, backgrounds and prediction should collect information relating to the conduct of the program should accordingly.

3. Writing Objectives in Behavioral Term—This term is used to render the objects under them are written in practical language. The transactions and 'job analysis' are both actions. These objectives the type **Robert magear**, **miller**, **gronlund** and needed from one approach or approaches to **davey** Method is used. Objectives appropriate functional type - select actions and should be used. Practical - the objective criteria are helpful in making examinations.

4. Development of Specific Outlines of Content—Students' prior experiences, practices and foreknowledge and pre-determined objectives consistent with the subject is planned. In this framework it is necessary to build therein all the subject comes up, the program have to make. Subject to the framework should make logical or psychological grounds. Subject outlines when creating content—even the experts are ready to help.

5. Construction of Criterian Test—Under the terms of the last students practices, criteria for evaluation of the test is constructed. The specific objectives of this trial Consistent objective questions are asked. It is used to evaluate all those behaviors and skills the program is designed to teach. The test criteria are called. The purpose of these tests is to know reach the learning objectives of the student and the norms or not. If you did not get to what extent? Why and how are reached can access them.

Notes Keep it mind that each instruction must aim for at least 3 or 4 Question should be tested. to them proper instructions and orders must be clearly outlined. If possible, these criteria the reliability and validity of examinations should be tested.

17.3 Development or Writing The Programme

Under this post is written to the actual programs or initiatives. Decisions before writing a variety of are like—

1. Program which method should be written, lineer, Branching or Mathematics Etc?

Notes

2. Learner's prior behavior/prior experience, How are they?
3. Assignments purpose—Which ones are being set?
4. Topic—What is the nature of the object?

Programe study of the fundamental principles of the program type should always be careful. Especially Should take note of the following three things—

(A) Designing of Frames

In the post, subject to the Frame (short—as short sentences) are written. Frame consists of three components—

1. **Stimulus**—The organ that situation to generate response as subject matter is presented to students in order to inspire students to respond.
2. **Response**—Post after reading is some kind of student responses must.
3. **Reinforcement/Feedback**—The right responses from the student's own response get matching and the reinforcement or feedback.

Generally: Included in the program are four types of post—

A. **Teaching Frames**—These posts before students through innovative subject matter is presented. These terms are in any program is approximately 60% to 70%.

B. **Practice Frames**—New subject matter/after teach new knowledge, knowledge practice is to make the creation of permanent posts. Students learned to use them using knowledge to practice again and again. Term can be placed up to 20% to 25%.

C. **Testing Frames**—Test steps to test the knowledge learned by students is constructed. The objective is to evaluate the knowledge learned. The 10% to 15% can be placed.

D. **Using Primes and Prompts to Guide Student's Responses**—This type of program should be written so that students do more and more accurate response. when the student appropriate are not able to respond to the Primes and Prompts is used. **Using auxiliary words and supplementary information under Primes is used to indicate to the students the correct response**. Use them preamble positions is more. **prompter signals which are a type of adjective Reducing students' incorrect responses to help students reach the correct response attach. These relate to subject is matter details, suitability and nature of the response**.

Did u know? Programmes are offered in more request them respectively at the end of the program is to be deleted altogether. This process is called Fading.

(B) Sequencing of Frames

Frame designed to ensure the continuity of the post (providing the proper order) are arranged. This logical sequence of psychological when organizing the 'teaching should use the formula. The Frames there are three main methods for providing proper order—

(1) Matrix Method, (2) Ruleg Method and (3)Egrul Method. These a method should be needed more than one method in accordance with the objectives of many programs has been used.

(C) Writing Initial Draft

After making the above type designation and Frame must write the program. **Editing**—Editing should carefully designed programs of the Draft. EditingThese are the three key things to note—

(1) The subject matter of a technical error, so it does not in any way be viewed. at this stage Subject—expert help can be obtained.

Notes

(2) **Program**—With the help of experts, it is seen that the original Draft techniques of instruction in the program, as Compositions, Frames give proper order or style of the original draft—language is not an error.

(3) **Language**—Prepared with the help of experts in the Draft grammar mistakes, Spelling errors and inappropriate and ambiguous language, is used to detect and fix. Instruction instructions obscurity, language uncertainty of the shortcomings and the inappropriateness of examples given are correct and original Draft the necessary changes are made.

17.4 Testing and Evaluation

This last task is the creation of the programmes, prepared under the revised Draft program is tested and evaluated. Following activities are conducted in—

(1) **Individual Tryout**—This program is administered at 4-5 students and it is detected in the finished program Draft position, size, language, suffixes, and memorandum relating to Upakramk - what are drawbacks. In addition, students' responses are noted and the necessary changes are made in the cleanup programme.

(2) **Small Group Tryout**-converting and re refined program—Students Group is to be administered. Necessary changes in the Draft and the students are asked for suggestions for improvement. The Views and taken note of the time and re-revision and refinement of all these programs is on the ground.

(3) **Field Tryout**—Program for the finalization of the program, a representative sample re-administered to the 10 to 20 students' reactions have been extensively and made suggestions based on the revised draft again. This test is based on the programmes relevance and validity is installed.

(4) **Evaluation**—Based on the data obtained from field tests to evaluate the following things is—

(*i*) **Error Rate**—The following formula is used to determine—

Total No. of Errors × 100

Programme Error Rate = ...

(In percentages)

Total No. of Responses × No. of Students

Error rate of 5%–10% linear program and can be up to 20% Branched programmes.

(*ii*) **Programme Density**—The difficulty level of the programmes is detected. The following formula is used to determine -

Total No. of Different Types of Responses in a Programme

TTR (Type Token Ratio) = ...

Total No. of Responses Required in a Programme

TTR value should be between 0.25 to 0.33.

Task How the programme rate is determined?

(*iii*) **Sequence Progression**—Sequence Progression can be seen with the help of Scalogram. Criteria Scalogram table is created on the basis of test scores. The table Based on the sequence of program flow is seen. If you look at the table shows that in the course sequence If the system is not fair to have to try to improve the program.

Notes

Self-Assessment

1. Fill in the blanks:

(*i*) Programmed study the creation of a high level ..... functions.

(*ii*) Students' prior experiences, foreknowledge and consistent with past practices and objectives set ..... framework is made.

(*iii*) Subject matter or logical framework ..... should draw on the ground.

(*iv*) Programme must be written so that the student do more and more perfect .....

(*v*) Prepared programme of original draft should carefully.....

17.5 Summary

- Programmed study the creation of a highly specialized task.
- Prior to the program, the program is being created for students - the students' age, Gender, Social, Economic, psychological level, interests, qualifications, background and collecting information relating to prediction The program should be organized accoringly.
- Students' prior experiences, practices and pre-determined objectives consistent with foreknowledge and subject outlines is created. Therein this framework it is necessary that the subject be If one is to make the program.
- Program should be written so that the students do more and more accurate response. When the student are not able to respond appropriately to the Primes and Prompts is used.

17.6 Keywords

- **Description**—Narration
- **Behavioural**—Related to behaviour

17.7 Review Questions

1. Describe programmed study conducted in preparation.
2. Explain in detail the composition or writing initiatives.
3. What is extinction?
4. Describe the program in test and evaluation process.
5. How Abhiram density is adjusted?

Answers: Self-Assessment

1. (*i*) Specific (*ii*) Subject Matter (*iii*) Psychological (*iv*) Response (*v*) Editing

17.8 Further Readings

Books

1. Education Technology—*S.K. Mangal, P.H.I. Learning.*
2. The basic premise of Educational Technology—*Yogesh Kumar Singh.*