PG ED S2-04 (DSC)

TWO YEAR MASTER'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER - II

EDUCATIONAL TECHNOLOGY

EDUCATION

Indira Miri School of Education

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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Printed: February, 2024

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Printed and published by Registrar on behalf of the Krishna Kanta Handiqui State Open University.

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CIET (Central Institute of Educational Technology), UGC (University Grants Commission) IGNOU (Indira Gandhi National Open University), NOS (National Open School), State ET Cells (State Educational Technology Cells), AVRC (Audio Visual Research Centre), EMRC (Educational Multimedia Research Centre), NIST (National Institute of Science and Technology)

COURSE INTRODUCTION

This is the course in Education for the 2nd semester of two years of Master Degree Programme. This course tries to provide the wide coverage of the core concepts of Educational Technology. Educational Technology is concerned with the application of laws, principles as well as recent discoveries of science and technology to the process of education. This particular section will introduce you to technology and explain its urgent needs, how it can be able to change your perspective towards teaching and learning process and also the importance of evaluation and research about systematic application of technological laws in the process of education to make it more efficient. Moreover, this course will help you to understand about the relationship of different aspects of technology with that of education. After going through this course, you will have a clear picture about the role of technology towards development of the education process as a whole.

The First Unit deals with the meaning and concept of educational technology, which contains the definitions, scope, significance and components of it. The Second Unit deals with the instructional objectives and the taxonomy of instructional objectives in various domains. The Third Unit incorporates in detail about the nature, scope and similarities and differences between educational and instructional technology. Fourth Unit defines about teaching aids and its different aspects. Fifth Unit explains the meaning of teaching strategies, its characterstics and types. Discussion on teaching models are also included here. The Sixth Unit is all about communication and instruction. The Seventh Unit is a reflection on concept of mass media approaches in educational technology. The last unit of this block, i.e., the Eight Unit explains the emerging trends in educational technology. Here, the concept of EDUSAT, Teleconferencing, and Computer Assisted Instruction are discussed along with their features.

The Ninth unit deals with meaning, objectives and importance of micro teaching. It also gives an attempt to reflect on the significance of micro teaching in raising the standard of teaching learning process. Unit Ten explains flander's interaction analysis and simulation. The Eleven unit tries to reflect on an important topic and that is programmed instruction, its principles, objectives, stages and types. It is also analyzing the merits and demerits of programme instruction. Again, Unit Twelve deals with another important topic that is internet. Along with the utility of internet in education at present, it also focuses on some of its major disadvantages. The unit thirteen brings a new concept and that is language laboratory. It gives clear description of meaning, definitions, characterstics, objectives and kinds of language laboratory. Fourteen unit deals with distance education and technology. This unit has elaborately explained the role of educational technology in the field of education. The last unit (unit Fifteen) explains about research center for educational technology.

While going through this SLM, you will come across some alongside boxes, which are put on the left side or right side of the text. These boxes will explain you meaning of some words and concepts within the text. Apart from this, there will be some broad and short questions which have been included under "ACTIVITY" and "CHECK YOUR PROGRESS" in every unit. Activities will increase your thinking capacity because questions put in Activity are not directly derived from text. Hints on the answers to the short questions have been put under sections "ANSWER TO CHECK YOUR PROGRESS". Besides, a few text- related questions have been put in "POSSIBLE QUESTIONS". These questions will help to draw your attention on the probable topics for the examination so that you can prepare for the examination with confidence.

UNIT 1: EDUCATIONAL TECHNOLOGY

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Meaning of Educational Technology

1.4 Nature of Educational Technology

1.5 Types of Educational Technology

1.6 Scope of Educational Technology

1.7 Significance of Educational Technology

1.8 Components of Educational Technology

1.9 Let Us Sum Up

1.10 Further Reading

1.11 Answer to Check Your Progress

1.12 Possible Questions

1.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- conceptualise educational technology;
- know the nature and types of educational technology;
- describe the scope of educational technology;
- develop understanding about the significance of educational technology;
- explain the components of educational technology.

1.2 INTRODUCTION

All aspects of human life today are influenced by scientific innovations and discoveries. The field of education is not out of its reach. Increased used of radios, tape recorders, televisions, computers, etc. has helped the education sector to get closer to educational technology. At present, all the fields of education such as goals, methods and techniques, teaching process and research are incomplete and crippled without technology.

Educational technology helps in both theoretical and practical area of knowledge. Educational technology has revolutionised the old concept of education and developed a trend in the old system of education. The term 'educational technology' was first used by Brynmawr Jones of England in the year 1967. After that, the National Council of Educational Technology analysed the term and now it is impossible to imagine an education system without educational technology. In this unit we shall discuss various aspects related to educational technology. Specially, we shall, discuss the meaning and nature of educational technology, the different types and scope of educational technology and its significance and components of educational technology here.

1.3 MEANING OF EDUCATIONAL TECHNOLOGY

J. K. Galbriath, in his book 'The New Industrial State' mentions two features of all kinds of technology. These are: (i) the systematic application of scientific knowledge in practical work and (ii) the division of practical work into parts and subparts. Educational technology means to achieve these two features. Educational technology does not determine the purpose of education. This task is determined by political leaders and philosophers on the basis of the broader direction of society. Educational technology determines the behavioural purpose of learning. It is a science on the basis of which methods and techniques are developed and formulated to achieve a pre-determined learning objective. After determining the learning objectives, educational technology works for the attainment of these aims.

At present, educational technology can be described as a systematic approach to the systematic design of the learning system. It provides methods and materials to improve the learning-teaching-evaluation process. Educational technology is not a result or concept of education; it is a way to achieve a pre-determined goal. Educational technology is not just technology in education or technology of education, but both are involved in the whole teaching-learning process. It involves the refinement of the behaviour of the teachers and the students.

Educational technology is the combination of five M's. These 5M are- Machines, Materials, Men, Media and Method. All these M's are related to one another and all of them are functional in order to achieve the educational goal. Educational technology is a process that establishes an interrelationship between the operation of machines, materials, men, media and methods to fulfil pre-determined educational purpose.

Some definitions of educational technology are mentioned below:

- According to 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 learning".
- In the words of B. C. Mathis, "Educational technology refers to the development of a set of systematic methods, practical knowledge for designing, operating and testing in school".
- According to Takshi Sakamato, "Educational technology is applied to practical study which aims at maximising educational effect by controlling such relevant facts as educational purpose, educational content, teaching materials, methods, educational environment, conduct of students, behaviour of instructors and inter-relations between students and instructors or teachers".

Therefore, it can be said that the concept of educational technology is very broad. It covers all aspects involved in the planning, implementation and evaluation of the teaching-learning process.



CHECK YOUR PROGRESS

Q 1: Who first used the term 'educational technology'?

.....

Q 2: Give a definition of educational technology.

.....



ACTIVITY 1.1

1. Find out from the students and teachers of different schools and colleges about the importance of technology in the field of education.

1.4 NATURE OF EDUCATIONAL TECHNOLOGY

On the basis of meaning and definitions of educational technology, some features of educational technology are mentioned below:

- The basis of educational technology is science. It studies the effects of science and technology on education. Science and technology are used in the context of education. So it can be called a practical aspect of science.
- Educational technology is a dynamic, continuous, progressive and productive approach. Trend and application of educational technology is changes with time and circumstances.
- With the help of this, various new modes of teaching-learning such as - Programmed Learning/Instruction, Micro-Teaching and Interaction Analysis etc. can be made possible.
- Educational technology adopts school as a method. In this system, school building, infrastructure, teacher, etc. are input; various methods, techniques, teaching, examination, etc. are the process and the student's skills are output.
- Educational technology provides technical guidance and solutions to the problems of education.
- Educational technology covers the entire teaching-learning process with the help of following components:
  - Specialization of goals and behavioural objectives
  - Analysis of student characteristics
  - Selection and organization of learning materials.
  - Procedures and Strategies for Content Presentation
  - Use of Aids, Mass Media and Communication Strategies
  - Effective exploration of Learning Conditions and Learning Environment

- Evaluation of continuous feedback and results.

- Educational technology can bring about the desired change in traditional teaching methods more efficiently and at lower cost.
- Educational technology includes all human and non-human resources of the teaching-learning process.

1.5 TYPES OF EDUCATIONAL TECHNOLOGY

Broadly educational technology is divided into four types. These types are explained below:

- **Teaching Technology:** Teaching is an art. Teaching technology has made this art easier, more accurate, practical and purposeful, and for this, scientific principles have been used in teaching technology. Two components of teaching are content and classroom behaviour or communication. Teaching technology covers both these components. According to Skinner (1968), teaching technology is that science which enhances a teacher's effectiveness and enriches the teaching process still more. Laying emphasis on the importance of teaching technology, Oliver (1960), Braham (1972) and Mitchell (1972) have said that teaching technology is needed in the present times which can make the teaching process more and more systematic and organised. In the changing circumstances, this technology works like a pillar to assist a teacher in carrying out his responsibility, making education and teaching more useful and effective. Teaching technology is born when the principles of psychology (how to teach), principle of sociology (what to teach) and principle of philosophy (why to teach) are put together to determine how to carry out effective teaching. In this regard, Dr. R. A. Sharma opined "It is the application of philosophical, sociological and scientific knowledge to teaching for achieving some specific learning objectives." Teaching technology makes the teaching process more effective, psychological, practical and experimental by which all students and teachers are benefited.

Some of the characteristics of teaching technology are mentioned below:

- The teaching technology helps the teacher to understand the cognitive, affective and psychomotor or conative abilities of the students.
- With the help of teaching technology, effective relationship can be established among three focal points of education - the teacher, the students and the subject matter.
- This technology practically use the knowledge of sociology, philosophy, psychology and science in order to make teaching process progressive.
- Teaching technology helps to observe, analyse, evaluate and improve the classroom behaviour of both students and teachers.
- Teaching technology facilitates learning, creates a supportive environment for learning to take place and helps the learner respond to such an environment effectively.
- Teaching technology provide guidelines to make teaching more practical and experimental.
- This technology motivates for the adaption of suitable teaching strategies, methods of teaching and teaching techniques.
- This technology also provides knowledge about how to control the behaviour of the students.

- **Instructional Technology:** Instructional technology mainly concerned with the right use of audio-visual aids and teaching materials for providing conceptual and practical information. It is that kind of educational technology which helps the teacher and the learner in the instructional task for the realisation of the instructional objectives in the teaching-learning situation. When psychological and scientific principles are assimilated into the teaching-learning process, then it is termed as instructional technology. The origin of instructional technology is from psychological laboratory experiments. The most important example of instructional technology is programmed learning/instruction which helps the

students to learn on the basis of their individual differences. In the words of Mc Murin, "Instructional technology is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives based on research on human learning and communication on human and non-human resources to bring about more effective instruction." Again according to Mangal, "Instructional technology may be defined as a subsystem of educational technology which helps the instructor or the learner himself as a part of his self-learning or auto instruction by determining the media, methods and materials for the realisation of the stipulated instructional objectives in a given teaching-learning situation." B. F. Skinner, Robert Glasser, Norman A. Crowder, Mager, Gilbert are some educationists who contributed in the development of instructional technology.

Some of the characteristics of instructional technology are mentioned below:

- The main function of instructional technology is to provide information.
- Cognitive objectives can be effectively realised with the help of instructional technology,
- This technology gives opportunities to students to learn at their own rate.
- In this technology, right responses of the respondents are reinforced.
- Instructional technology uses the principles of psychology, philosophy and science.
- Instructional technology makes use of both human and non-human resources for making teaching effective.
- This technology maintains coordination among different topics by analysing content.
- This technology evaluates terminal behaviour under classroom conditions.

- **Behavioural Technology:** Behavioural technology focuses on psychological principles in the teaching-learning process that influences desirable behavioural changes of student. Behavioural technology studies how student behaviour can be changed in a desirable way and how teachers' behaviour can be developed in the classroom. Behavioural technology is that science which studies the behaviour of teachers in the field of education by using scientific methods and also modifies the behaviour of teachers as needed. Amidon, Flander, Skinner, Ober and Anderson are some chief exponents who contributed a lot in the field of behavioural technology. The main purpose of behavioural technology is to modify the learning process so that students' behaviour can be modified according to the desired objectives of learning. This technology studies and modifies both verbal and non-verbal behaviours.

  The main features of behavioural technology are:

  - Behavioural technology studies both verbal and non-verbal behaviours in the classroom.
  - The objective of behavioural technology is to bring about desirable change in the classroom behaviour.
  - This technology is psychology-oriented ideology.
  - This technology is helpful for the development of teaching principles.
  - This technology evaluates the teacher scientifically.
  - It applies psychological principles in the field of teaching and learning.
  - This technology helps in realizing the cognitive and psycho-motor objectives.
  - This technology is based on different principles of operant conditioning and reinforcement etc.
  - This technology emphasizes on individual differences.
- **Instructional Design:** The fourth type of educational technology is instructional design. Instructional design occupies an important place in the teaching process. The term instructional design consists of

two words; these are- instruction and design. Instruction means the act of providing information and design means the principles 'verified by scientific methods'. The designs used in teaching circumstances, works, methods and approaches jointly are called instructional design. According to David Marrill, "Instructional design is the process of specifying and producing particular environmental situations which cause the learner to interact in such a way that specified change occurs in his behaviour." In the words of Derick Unwin, "Instructional design is concerned application of modern skills and techniques of requirement of education and training. This includes the facilitation of learning by manipulation of media and methods and the control of the environment in so far as this reflects on learning."



CHECK YOUR PROGRESS

Q 3: Mention one feature of teaching technology.

.....

Q 4: Define instructional design.

.....

1.6 SCOPE OF EDUCATIONAL TECHNOLOGY

It is important to know the scope of educational technology in order to determine its limitations and scope of work. The following are some of the scopes of educational technology.

- **Analysis of Teaching-Learning Process:** This is an important aspect of educational technology and it scientifically discuss the concept of teaching, variables of teaching, theories of learning, stages of teaching, levels of teaching, principles and maxims of teaching, concept of learning, relationship between teaching and learning, relevance of the theory of learning, the integration of

teaching and learning theory for appropriate educational process, etc.

- **Development of Educational Goals or Objectives:** This aspect of educational technology tries to discuss the educational needs and aspirations of the society. It surveys the resources available to meet these needs and aspirations. In addition to this, it studies the objectives of classroom teaching and learning as well as broader educational objectives, behavioural analysis of these objectives and so on.
- **Development of Curriculum:** This aspect of educational technology is important in the development of the curriculum required to achieve a stipulated objectives. This aspect of educational technology tries to discuss about ways of selecting appropriate learning methods, topics, organization of topics in appropriate sizes, arrangement of appropriate instruction for the subject and analysis of the curriculum based on objectives, methods, materials and assessment tools etc.
- **Development of Teaching-Learning Material:** This aspect of educational technology deals with the production and development of appropriate teaching-learning materials based on specific objectives, curriculum and available materials. In this regard, educational technology develops important strategies or instructional approaches and instructional materials such as programmed learning materials, computer aided learning materials, mass media instruction materials, planning of teaching and learning instruments etc.
- **Preparation of Teacher:** Teacher is the key person in the teaching-learning process. Therefore, teachers need proper training to carry out their complex responsibilities smoothly. Educational technology has taken the training or preparation of teachers as an important subject of study. In this case, some contents of study are- teaching model, stimulated teaching, micro-teaching, team teaching, modification of teacher behaviour, teacher effectiveness, classroom

interaction, etc.

- **Development and Selection of Teaching-Learning Strategies and Tactics:** This aspect of educational technology is deals with the central problem of the teaching-learning process. Here, educational technology tries to describe the ways and means of discovering, selecting and developing suitable strategies and tactics of teaching in terms of optimum learning and available teaching-learning resources, availability of teaching methods, devices and models of teaching along with their appropriate selection and use for optimum results.
- **Development, Selection and Use of the Appropriate Audio-Visual aids:** Educational technology covers this aspect by discussing various audio-visual tools used for educational purpose, their selection according to teaching-learning situation, development and production of educational resources etc. It also covers the proper storage and cost of these devices.
- **Effective Utilization of the Hardware and Mass-Media:** Educational technology tries to describe different materials such as sophisticated resources and gadgets used in education in terms of their specific functions and applicability in a particular teaching-learning situation; along with their selection, proper handling and maintenance, preparation and development etc.
- **Application of System Approach and its different Components:** Education is a system where various systematic and scientific measures are taken for the attainment of educational objectives. Therefore, educational technology incorporates and attempts to study the various aspects associated with system approach. System approach of educational technology include the interpretation of the educational process, the theories and principles of system approach, the effectiveness of different components in terms of its input and output aspects, and various human and non-human resources.
- **Feedback and Control through Evaluation:** Feedback and control are two essential aspects of the teaching-learning situation.

Feedback makes teaching strategies more effective. On the other hand, the assessment is related with the entire educational system, such as - goals, methods, content, curriculum, etc. The assessment provides feedback to teachers and students for their appropriate work in preparation and execution level.

Therefore, it can be said that educational technology is essentially related to all the variables of the teaching-learning process such as stages, levels and directions. The scope of educational technology is unlimited because there is no limit to the scope of education.



CHECK YOUR PROGRESS

Q 5: Write briefly about one important subject-matter of educational technology.

.....

1.7 SIGNIFICANCE OF EDUCATIONAL TECHNOLOGY

It is not possible to imagine an education system without the use of educational technology. It is actually need of the hour. Significance of educational technology is analysed with the help of following points:

- Educational technology broadens the outlook and approach of education and makes education more realistic, experimental and innovative.
- Education technology developed an objective and realistic viewpoint towards the study of educational problems.
- Use of educational technology made education an individualised activity rather than making it a collective or group activity.
- Educational technology has improved the quality of teaching by using more flexible and variable methods and techniques of teaching.
- Educational technology contributed in equalise educational

opportunity to all people irrespective of their socio-economic status. It also helps in providing equal educational opportunity to those who are especially able and those who are living in geographical isolation.

- Through the use of educational technology, development of mass education by making it open to all people has been made possible.
- Spirit of innovation and experimentation has been encouraged by the use of educational technology in modern education.

Thus, it is observed that educational technology play an important role in the present education system.

1.8 COMPONENTS OF EDUCATIONAL TECHNOLOGY

The components of educational technology can be divided into three main categories. These are: hardware approach, software approach and system approach. These components are briefly described below:

- **Hardware Approach or Educational Technology-1**: In hardware approach, special emphasis is given on teaching tools. This approach is based on the theories and practices of physics and engineering sciences. This approach is originated from physics and engineering technology. Education is incomplete without the use of devices like tape recorders, televisions, projectors etc. The compulsory application of these devices is strengthened by the hardware approach. In 1961, David said that this approach was essential for teaching and training. That's why Silverman called it Technology in Education. Silverman termed this approach as 'Relative Technology'. Dr. Ruhela said, "This part of educational technology refers to tools and hardware such as teaching machines, televisions, tape recorders, etc., which are used in the field of instruction."

A. Lumsdeine was the first to describe the hardware approach. This approach is also known as audio-visual aids. Here, more emphasis is given technology of machine. This approach believes that machines

can teach and is therefore related to cognitive aspect of instruction. This approach lays special emphasis on three things. These are: Preservation of Learning, Transmission of Learning and Advancement of Learning.

Some of the devices of hardware approach are - chalk boards, radios, overhead projectors, slide projectors, VCRs, televisions, monitors, computer calculators, computer printers, audio-visual recorders, etc.

- **Software Approach or Educational Technology-2:** The software approach is mainly concerned by the use of psychological principles in the field of teaching and learning so that desirable changes can be brought about in students. This approach is also known as instructional technology, teaching technology, behavioural technology, etc. Silverman has called this approach of educational technology a new name of 'Constructive educational technology'. Machines are used in this approach to present the content more effectively. This approach is mainly concerned with all the three aspects of education - input, process and output. Software approaches involve a variety of psychological aspects of student learning such as interest, aptitude, motivation, reinforcement, modification, feedback and so on. According to Davis, "This view of educational technology is closely associated with modern principles of programmed learning and is characterized by task analysis, writing precise objectives, selection of correct responses and constant evaluation".

Some of the software approaches of educational technology are- chalk work, transparencies, slides, video programmes, computer programmes, recorded materials, written materials etc.

There are certain differences between hardware and software approaches of educational technology. These are mentioned below:

Hardware Approach	Software Approach
1. This approach is originated from physics and engineering science.	1. This approach is originated from behavioural technology.
2. This approach is related with the development and application of audio-visual aids, modern apparatus and mass-media.	2. This approach is related to the development and application of software techniques such as teaching content, teaching-learning techniques and other means etc.
3. This approach is also known as 'Relative technology'.	3. This approach is known as 'Constructive educational technology'.
4. This approach is mainly concerned with the use of machines in the field of education.	4. This approach is mainly concerned with the use of psychological principles in the field of education for desirable changes of students' behaviour.
5. Some of the devices of hardware approach are - chalk boards, radios, overhead projectors, slide projectors, VCRs, televisions, monitors, computer calculators, computer printers, audio-visual recorders, etc.	5. Some of the software approaches of educational technology are- chalk work, transparencies, slides, video programmes, computer programmes, recorded materials, written materials etc.

- **System Approach or Educational Technology - 3:** In the age of modern educational technology, system approach is not a new concept. This approach is significant for technology, commercial and administrative work. The term System approach has been formed by two words: system + approach. System means the totality in which all the elements, factors and components work in a self-contained manner. System approach believes in totality. Teaching and learning according to this approach Is a social and technological

process. This approach is learner-centred. As a process, a system approach incorporates all the elements of education. In system approach, all the elements teachers, students, curriculum, classrooms, instructional materials and strategies, social environment, etc. are included.

According to Keshow and Michean, "Systems approach is one of the techniques which aims at finding the most efficient and economically intelligent methods for solving the problems of education scientifically." Again, Hall opined, "A system approach is a set of objects together with a relationship between the objectives and their attributes."

Following are the characteristics of system approach:

- System approach is the base of planning, development, presentation and evaluation of instruction.
- In provides a suitable basis for the determination of objectives from analysis of environment system.
- This approach is integrated and dynamic.
- Instructional objectives are so set by which their accomplishment can be observed easily.
- In this approach, elements are systematically arranged which functions in a specific manner.
- This approach uses the human resource, finance, machinery and material for problem solving in an effective manner.



CHECK YOUR PROGRESS

Q 6: What is the view of Ruhela regarding hardware approach of educational technology?

.....

Q 7: Mention three features of system approach.

.....



1.9 LET US SUM UP

In this unit we have discussed the following matters:

- Educational technology can be described as a systematic approach to the systematic design of the learning system. It provides methods and materials to improve the learning-teaching-evaluation process.
- Educational technology is the combination of five M's. These 5M are- Machines, Materials, Men, Media and Method.
- The basis of educational technology is science. It studies the effects of science and technology on education. Science and technology are used in the context of education. So it can be called a practical aspect of science.
- Educational technology is divided into four types. These are- teaching technology, behavioural technology, instructional technology and instructional design.
- Educational technology is essentially related to all the variables of the teaching-learning process such as stages, levels and directions. The scope of educational technology is infinite because there is no limit to the scope of education.
- In hardware approach, special emphasis is given on teaching tools. This approach is based on the theories and practices of physics and engineering sciences.
- Software approach is mainly concerned with all the three aspects of education- input, process and output. Software approaches involve a variety of psychological aspects of student learning such as interest, aptitude, motivation, reinforcement, modification, feedback and so on.



1.10 FURTHER READING

1) Kulshreshtha and Kulshreshtha (2016). Foundations of Educational Technology. Meerut: R. Lall Book Depot.
2) Mangal and Mangal (2009). Essentials of Educational Technology. Delhi: PHI Learning Private Limited.

3) Sampath ET. Al (2004). Introduction to Educational Technology. New Delhi: Sterling Publishers Private Limited.
4) Sharma, A. R. (1992). Educational Technology. Agra: Vinod Pustak Mandir.
5) Sharma, R. A. (2012). Educational Technology and Management. Meerut: R. Lall Book Depot.

1.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Brynmor Jones.

Ans to Q No 1: According to 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 learning".

Ans to Q No 1: One feature of teaching technology is: The cognitive, affective and psycho-motor domains are studies with the help of teaching technology.

Ans to Q No 1: According to David Marrill, "Instructional design is the process of specifying and producing particular environmental situations which cause the learner to interact in such a way that specified change occurs in his behaviour."

Ans to Q No 1: One important subject matter of educational technology is development of curriculum. This scope of educational technology is important in the development of the curriculum required to achieve a stipulated objectives. This aspect of educational technology tries to discuss about ways of selecting appropriate learning methods, topics, organization of topics in appropriate sizes, arrangement of appropriate instruction for the subject and analysis of the curriculum based on objectives, methods, materials and assessment tools etc.

Ans to Q No 1: Dr. Ruhela said that hardware approach of educational technology refers to tools and hardware such as teaching machines, televisions, tape recorders, etc., which are used in the field of instruction.

Ans to Q No 1: Three features of system approach are:

- System approach is the base of planning, development, presentation and evaluation of instruction.
- In provides a suitable basis for the determination of objectives from analysis of environment system.
- This approach is integrated and dynamic.



1.12 POSSIBLE QUESTIONS

A. Very Short Questions

Q 1: What is 5M of educational technology?

Q 2: What is meant by hardware approach of educational technology?

Q 3: Define teaching technology.

Q 4: What are the three elements of system approach?

Q 5: Define system approach.

B. Short Questions (Answer each question in around 150 words).

Q 1: Differentiate hardware and software approach of educational technology.

Q 2: Write a note on behavioural technology.

Q 3: Write a note on the nature of educational technology.

Q 4: Describe the significance of educational technology.

Q 5: Write the characteristics of instructional technology.

C. Long Questions. (Answer each question in around 300-500 words)

Q 1: What is meant by educational technology? Explain its nature.

Q 2: Briefly discuss the components of educational technology.

Q 3: Describe the scope of educational technology.

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UNIT 2: INSTRUCTIONAL OBJECTIVES

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 Meaning of Instructional Objectives

- 2.3.1 Importance of Instructional Objectives
- 2.3.2 Difference between Instructional Objectives and General Objectives

2.4 Taxonomy of Instructional Objectives

- 2.4.1 Taxonomy of Instructional Objectives in Cognitive Domain
- 2.4.2 Taxonomy of Instructional Objectives in Affective Domain
- 2.4.3 Taxonomy of Instructional Objectives in Affective Domain

2.5 Let Us Sum Up

2.6 Further Reading

2.7 Answer to Check Your Progress

2.8 Possible Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- Comprehend the instructional objectives
- Explain the significance of instructional objectives
- Understand the taxonomy of instructional objectives in various domains.

2.2 INTRODUCTION

In the first unit of this block, you have learned about educational technology or use of technology in education. We know that teaching is a very systematic and purposeful task. Use of technology in the classroom or education makes it more effective and fruitful. By a teacher has to take special care and caution while applying it as he/she has to follow some instructional objectives. In your previous semester, course 4 (Method and

Technique of Teaching and Teaching Practical) you have come across the term "taxonomy" of educational objectives. Here in this unit, we will discuss about the instructional objectives and the taxonomy of instructional objectives used by a teacher in the classroom to transact the class. Let's start with the concept or meaning of instructional objectives.

2.3 MEANING OF INSTRUCTIONAL OBJECTIVES

Whenever, we make our mind to go or to travel somewhere, first thing that comes to our mind is the place or destination. We decide a particular place or destination because of its significance like Delhi for Taj Mahal or Goa for the Beach or Ootty for its natural beauty. This implies before reaching the particular place, we determine some goals in our mind to visit those place of significance. We determine some objectives in our mind in terms of sightseeing or fooding as well as lodging. Likewise, when a teacher enters into a class, he doesn't enter alone. He enters with a detailed plan and some objectives. Teaching as we know is the process of imparting instruction of a particular lesson, unit or sub-units with the help of different tools, methods and skills. While imparting the lesson, the teacher has to place before the students some definite and very specific objectives within a specified classroom period and resources in hand. These objectives are known as Instructional Objectives. The primary objectives of these objectives are to -bring desired changes in the behaviour of students.

The term instructional objective in relation to the teaching of a particular subject may be defined as a group of statements formulated by a teacher for describing what the pupils are expected to do or will be able to do once the process of classroom instruction is over. Instructional objectives are quite narrow, specific, definite, clear and practically well attainable in comparison to the general aims and objectives of teaching a subject. Instructional objectives have the specific feature that these are always stated in terms of the expected or desired changes in the behaviour of the learners and are also considered quite measurable in terms of their evaluation as the instructional output. They are definite, tangible and precise. These

objectives are pre-determined and formulated in such a way that their attainment becomes quite practicable through the usual classroom teaching within stipulated period of fixed duration.

In the words of R.H. Dadis, learning objectives or instructional objectives are the description of the behaviour expected of a learner after instruction.

2.3.1 Importance of Instructional Objectives

As discussed above, instructional objectives are immediate, specific and attainable goals of education. These objectives are those goals towards which pupil progress. Instructional objectives are an intent communicated by a statement describing a proposed change in a learner--a statement of what the learner is to be likely when he/she has successfully completed a learning experiences. As learning is an inferred event, hence, it must be determined what behaviour or performance will constitute sufficient evidence that the desired ability exists. These are the objectives upon which, the success of the classroom transaction and success of learning relies on because the learning stands for modification of behaviour of the learners through experiences. These objectives are an essential part of total teaching -learning process. The following points will help you to realize the importance of instructional objectives-

- Instructional objectives give direction and guide the educational efforts.
- These are the objectives which suggest the teacher in general strategies and specific activities for their attainment. Different set of objectives usually generates different strategies.
- Instructional objectives acts as a director for both teachers and students in performing the educational activities.
- These instructional objectives serve a diagnostic -prescriptive function. On the basis of these objectives, teacher can assess where they are, how much progress has been made on the part of the learners and they can act as well as plan accordingly.

- Instructional objectives also aids in collecting data about the students' progress. It dictate to a great extent way in which we collect status data.
- Instructional objectives are essential for evaluation process as without these objectives, it is even impossible to evaluate an educational efforts.
- Instructional objectives serve a communication function to. It serves not only to communicate what is being done, but also to what end.



CHECK YOUR PROGRESS

Q 1: Why instructional objectives are important?

.....

2.3.2 Difference between Instructional Objectives and General Objectives

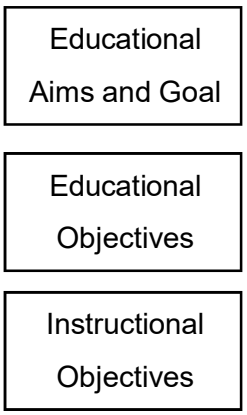
Though many times, instructional objectives and general objectives of teaching are used simultaneously, but, they are actually not the same. General objectives of teaching are known as long-ranged ultimate goals. Whereas instructional objectives are time specific within a specific place and resources in hand. The following table will help you to grasp the difference between the two-

General Objectives/ Educational Objective	Instructional Objectives
Realization of general objectives may require long period or with the completion of schooling by the students.	Instructional objectives are time and period specific.

General objectives of teaching a subject are derivation of the aims of teaching that subject. For proper realization of it, aims are broken into some definite, functional units. It implies the broad nature of General objectives.	Instructional objectives are narrow and specific in comparison to the general objectives.
Attainment of general objectives is long way process. General objectives are broad-based, lofty and difficult to achieve.	Attainment of instructional objectives are quite possible within the educational structure and means.
General objectives are not stated in behavioural term. They are broad based objectives of education. As such they are known as Educational Objectives.	Instructional objectives are always stated in terms of expected pupils' behaviour or desired behavioural changes. Therefore they are termed as teaching-learning objectives or behavioural objectives.
The purpose of general objectives are all –round development of each students.	The purpose of these objectives are to provide statements of skills, concepts and the behaviour and the learners are expected to demonstrate after going through particular instruction.

Though there are differences between the general and instructional objectives, they are interrelated. General objectives are broad and instructional objectives are a part of it. Classroom instructional objectives mare submerged in the reservoir of general objectives of teaching a subject at a particular school stage that in turn, are further submerged in the ocean of general aims and goals of teaching the subject.

The following diagram will help you to understand this interrelationship-



2.4 TAXONOMY OF INSTRUCTIONAL OBJECTIVES

The word "Taxonomy" is not new to you. The taxonomy stands for a system of classification. Whenever we talk about the taxonomy of instructional objectives, Taxonomy of Bloom comes first. Blooms' taxonomy presents a system of classification of the instructional objectives. Benjamin Bloom had designed the taxonomy in order to help teachers and instructional designers to classify instructional objectives. The taxonomy of educational and instructional objectives has been worked out on the assumptions that the teaching-learning process may be conceived as an attempt to change the behaviour of the pupils with respect to some subject matter or learning experiences. The taxonomy of the educational objectives should be set up on the basis of considering the philosophical, psychological and scientific principles. Here, it is important to mention here that, behaviour is divided into three domains-cognitive (knowing), affective (feeling) and psychomotor (doing). The taxonomy of educational and instructional objectives has also been considered to be belonging these three domains.

The taxonomy related to cognitive domain has been presented by Benjamin Bloom and his associates namely-M.D Englehart, E. J Furst, W.H. Hill (Bloom et.al 1956). The second one related to affective domain was developed by David Krathwohl, Bloom and Masia (Krath Wohl et.al 1964). The psycho-motor domain was developed by Harrow (1972) and Simpson (1966). Benjamin Bloom was the pioneer of this taxonomy of instructional objectives and hence it is popularly known as Bloom's Taxonomy of instructional objectives.

The main aim of taxonomy of instructional objective is to provide a structure in order to categorise the instruction as well as the instructional assessment.

2.4.1. Taxonomy of Instructional Objectives in Cognitive Domain

Taxonomy of objectives in the cognitive domain given by Bloom and his associates tries to provide the most difficult but highly promising task of classifying instructional objectives on a continuum from the simple to the relatively complex. It helps the teachers to keep him reminded that are indeed many and important high mental processes beyond the acquisition of knowledge on the part of his/her students/ learners.

Taxonomy of instructional objectives in the Cognitive Domain

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Let's explain the Taxonomy of instructional objectives in the Cognitive Domain in details-

- **Knowledge:** It represents the lowest level of the instructional objectives belonging to cognitive domain and primarily aims for the acquisition of the knowledge concerning like-specific facts, terminology, methods and processes, generalized principles, theories and structure. The knowledge objectives mainly call for recall and recognition level of one's memory and therefore their evaluation is primarily made through a simple recall or multiple type questions.
  - Knowledge of specifics
  - Knowledge of Terminology

- Knowledge of specific facts
- Knowledge of ways and means of dealing with specifics
- Knowledge of conventions
- Knowledge of trends and sequence
- Knowledge of classification and categories
- Knowledge of criteria
- Knowledge of methodology
- Knowledge of universal and abstractions in a field
- Knowledge of principles and generalization
- Knowledge of theories and structures

- **Comprehension:** The comprehension is based upon knowledge. If there is no knowledge, there will be no comprehension. On the ladder of the acquisition of cognitive abilities, its level is little higher than knowledge specifically, it means the basic understanding of the facts, ideas, methods, processes, principles or theories. As a result, what is communicated to a learner he may-
  - Translate (Translation)or summarize the communicated knowledge in his own words
  - Interpret (interpretation) i.e. cite example, discriminate, classify , verify or generalize
  - Extrapolate(Extrapolation) i.e., estimate or understand the use of knowledge and extend it to other subjects and fields
- **Application:** Knowledge is useful only when it is possible to be applied. The application of an idea, principles or theory made be made possible only when it is grasped and understood properly. Therefore the category of application automatically involves both the earlier categories, i.e., knowledge and comprehension. Under this instructional objectives, the learner is required to acquire the ability to make use of the abstract or generalize ideas, principles in the particular and concreate situation.

- **Analysis:** Analysis refers to an understanding at a higher level. It is a complex cognitive process that involves knowledge, comprehension as well as application of an idea, facts, principles or theory. Through the realization of this instructional objectives, the learner is expected to acquire the necessary skills in drawing inferences, discriminating, making choices and selection and separating apart the different components or elements of a concept, object or principles. Taxonomy of instructional objectives under analysis includes-
  - Analysis of elements
  - Analysis of relationship
  - Analysis of organizational principles
- **Synthesis:** The objectives belonging to this category aims to help the learners acquire necessary ability to combine the different element or components of an idea, object, concept, principles to produce an integrated picture i.e., the figure of wholeness. As a result, he/she may be expected to propagate or present a theory or principles by combining the different approaches, ideas, or viewpoints. Synthesis calls for the creativity aspects of the cognitive abilities and hence, it may be considered definitely a higher level of learning involving knowledge, comprehension, application as well as analysis. Instructional objectives under the ladder of synthesis includes-
  - Production of unique communication
  - Production of plan or proposed set of operations
  - Derivation of a set of abstract relations
- **Evaluation:** The category of the instructional objectives aims to develop in the learners the ability to make proper value judgement about what has been acquired by him/ her in the form of knowledge, understanding, application, analysis and synthesis. It represents definitely the higher level of objectives belonging to cognitive domain and involves all the five categories that we have described earlier. As a result, the learner is expected

to take proper decision about the competitive value of the particular idea, object, principles or theories. He may arrive at an appropriate decision about the matter and methods by making use of all the cognitive abilities acquired through the earlier categories of cognitive objectives. Instructional objectives under the ladder of evaluation includes-

- Judgement in terms of internal evidence
- Judgement in terms of external criteria



CHECK YOUR PROGRESS

Q 2: What are the taxonomy of instructional objectives under cognitive domain?

.....

The following table will help you more on understanding taxonomy of instructional objectives in terms of behavioural pattern-

Table 1: Bloom's Taxonomy of Educational Objectives for Knowledge-Based Goals (Cognitive Domain)

Level of Expertise	Description of Level	Example of Measurable Student Outcome
1. Knowledge	Recall, recognition of terms, ideas, procedure, theories, etc.	When is the first day of Spring?
2. Comprehension	Translate, interpret, extrapolate, but not see full implications or transfer to other situations, closer to literal translation.	What does the summer solstice represent?
3. Application	Apply abstractions, general principles, or methods to specific concrete situations.	What would Earth's seasons be like if its orbit was perfectly circular?
4. Analysis	Separation of a complex idea into its constituent parts and an understanding of organization and relationship between the parts. Includes realizing the distinction between hypothesis and fact as well as between relevant and extraneous variables.	Why are seasons reversed in the southern hemisphere?

5.Synthesis	Creative, mental construction of ideas and concepts from multiple sources to form complex ideas into a new, integrated, and meaningful pattern subject to given constraints	If the longest day of the year is in June, why is the northern hemisphere hottest in August?
6. Evaluation	To make a judgment of ideas or methods using external evidence or self-selected criteria substantiated by observations or informed rationalizations.	What would be the important variables for predicting seasons on a newly discovered planet?

1.4.2. Taxonomy of Instructional Objectives in Affective Domain

The taxonomy of objectives in the affective domain arranged from the lowest to the highest level of function are-

- Receiving (Attending)
- Responding
- Valuing
- Organizing
- Characterization by a value or value complex

Further elaboration will help you to understand the taxonomy of objectives in the affective domain.

- **Receiving (Attending):** It represent the initial category of the objectives belonging to affective domain. For the inculcation of certain interest, attitudes, values or ideas, it is essential that the learner is made to receive or attend the desired ideas, events or ideas. This category points out towards this necessity and takes into consideration three types of sequential activities as follows-
  - The learner is sensitized or made aware of the existence of certain stimuli.
  - Then the desired intention and willingness for receiving or attending the stimuli is created in the learner.
  - Efforts are made for the control of the attention of the learner,

he may be trained to pay selective attention and sustain it for a desired period

- **Responding:** It represents the second level of instructional objectives belonging to affective domain. Once a learner receives and attends to a particular idea, events or thing, he must be made to respond to it as actively as possible. The responses here do not confine itself in just paying attention or arousal of a simple intention or desired of getting a thing, as in the first category of receiving, but manifest themselves in the active behaviour like obeying, answering, reading, discussing, recording, writing and reacting to a stimulus.
- **Valuing:** When one attends as well as responds to a particular thing, idea or events, he is naturally briefed towards value judgement about the thing, idea or events, therefore this category of valuing depends upon both the former categories i.e., receiving and responding. Here the learner is expected to imbibe a definite value pattern towards different ideas, events or objects. In practice, the objectives belonging to this category are usually concerned to the development of typical value patterns and attitudes.
- **Organizing:** This category of objectives is concerned with the construction of relatively enduring value structure in the learner by organizing and synthesising the different value patterns imbibed by him from time to time. Ultimately, this category of objectives leads the learner to form a set value structure or philosophy of life.
- .**Characterization by a value or value complex:** It is the highest level in the categories of the objective belonging to the affective domain. Up to this stage, the learner is able to imbibe all the essential effective behaviour i.e., various interest, attitudes, values, value patterns, a permanent value structure and therefore all the earlier categories are automatically involved in the objectives of these category. At this stage, the learner is

destined to imbibe typical characteristics of his individual character i.e., lifestyle of his own. In fact it is the end point or ultimate goal of education.

The following table will help you more on understanding taxonomy of instructional objectives in terms of behavioural pattern-

Table 2: Bloom's Taxonomy of Educational Objectives for Skills-Based Goals (Affective Domain)

Level of Expertise	Description of Level	Example of Measurable student outcome
1.Receiving	Demonstrates a willingness to participate in the activity	When I'm in class I am attentive to the instructor, take notes, etc. I do not read the newspaper instead.
2.Responding	Shows interest in the objects, phenomena, or activity by seeking it out or pursuing it for pleasure	I complete my homework and participate in class discussions.
3.Valuing	Internalizes an appreciation for (values) the objectives, phenomena, or activity	I seek out information in popular media related to my class.
4.Organization	Begins to compare different values, and resolves conflicts between them to form an internally consistent system of values	Some of the ideas I've learned in my class differ from my previous beliefs. How do I resolve this?
5.Characterization by a Value or Value Complex	Adopts a long-term value system that is "pervasive, consistent, and predictable"	I've decided to take my family on a vacation to visit some of the places I learned about in my class

2.4.3. Taxonomy of Instructional Objectives in Psycho-motor Domain

The psychomotor domain concerns things students might physically do. It was Simpson who first presented the classification of the objectives in the psycho-motor domain. Later it was modified by Harrow (1972) .Those given by Harrow are discussed below arranged from lowest to highest category in the psycho-motor domain

- **Reflex Movement:** Reflect movement may be considered as the involuntary motor responds to various stimuli in the environment. Examples of such reflects movement or actions are-jerking of hands, closing of eye lid, sketching of the arms etc. These movements represents the lowest level of psycho0motor domain. They are largely controlled by autonomous nervous system
- **Basic fundamental movements:** The fundamental movements are just a step ahead of the simple reflex movement. They are not inborn and innate as the reflex movement, but a child may be seen to demonstrate such movements from very early days of his life. His movement in the form of kneeling, creeping, stumbling, walking, jumping, moving hands and neck etc. may be called basic fundamental movements.
- **Perceptual abilities:** The development of motor abilities related to the phenomenon of perception belongs to this category of objectives. When some meaning is attached to sensation, it is termed as perception. As a result, the learner is able to derive useful meanings out of the exposure of their senses to various stimuli in the environment. Such type of behaviour is learned behaviour. It is always acquired through experience and systematic training.
- **Physical abilities:** For an effective motor behaviour there is an urgent need of the development of desirable physical abilities. If one has adequate physical stamina and abilities he may go ahead in the task of improving his psychomotor behaviour. Therefore this category of objectives aim to develop the various physical abilities of the learners like - Tolerance to stand against rough weather, to carry heavy load or running and object or machine etc.
- **Skilled movement:** Skilled movements are those complex bodily movements which help in performing skilled task. These movements can be acquired through an organized and

systematic learning process. Their acquisition requires an intelligent understanding and sufficient drill or practice work on the part of the learners. The art of dancing, driving, playing musical organs, skating, typing, swimming and tailoring represents such skill movements. The development of the abilities concerning such skilled movement depends upon the development of the motor abilities described under all the earlier four categories.

- **Non discursive communication:** This category represents the highest level of psycho-motor behaviour. The bodily movements are hereby integrated with inner feelings and effective behaviour of the learner. In this way, the non-discursive communication may be defined in terms of the overt behaviour activities related to communication of affective behaviour feeling or emotion. This communication may range from a simple behaviour expressed through posing or facial expression to a complex behaviour performed through a highly sophisticated classical dance, painting or acting.



CHECK YOUR PROGRESS

Q 3: What is non-discursive communication?

.....

The following table will help you more on understanding taxonomy of instructional objectives in terms of behavioural pattern-

Table 3: Bloom's Taxonomy of Educational Objectives for Skills-Based (Psycho Motor) Goals

Level of Expertise	Description of level	Example
1. Reflex movement	Involuntary motor response to various stimuli in the environment	Jerking of hands, closing of eyelid, stretching of the arms etc.
2. Basic fundamental movements	They are not inborn and innate as the reflex movements from very early days of his life	People's movement
3. Perceptual abilities	Exposure of the senses to various stimuli in the environment.	Catching,balancing distinguishing etc.
4. Physical abilities	Desirable physical abilities.	Tolerance to stand against rough weather, to carry heavy load
5. Skilled movement	Complex bodily movements which help in performing skilled task	The art of dancing, driving, playing musical organs, skating, typing, swimming
6. Non discursive communication	The bodily movements that are hereby integrated with inner feelings and effective behaviour of the learner.	Sophisticated classical dance, painting or acting.



2.5 LET US SUM UP

After going through the detailed discussion on this unit, we can summarize it as-

- Instructional objectives stands for those well-meaning definite statement that are used for expressing the instructional outcomes of a particular lesson/ subunit of a subject of the prescribed curriculum in behavioural terms, i.e., outlining the definite changes in the behaviour of the students through the study of the topic.
- An instructional objective is an ability or skill expressed in behavioural term.
- In the words of R.H. Dadis, learning objectives or instructional objectives are the description of the behaviour expected of a learner after instruction.
- These instructional objectives serve a diagnostic -prescriptive function. On the basis of these objectives, teacher can assess

where they are, how much progress has been made on the part of the learners and they can act as well as plan accordingly.

- General objectives of teaching are known as long-ranged ultimate goals whereas instructional objectives are time specific within a specific place and resources in hand.
- Though there are differences between the general and instructional objectives, they are interrelated. General objectives are broad and instructional objectives are a part of it.
- The taxonomy of educational and instructional objectives has been worked out on the assumptions that the teaching-learning process may be conceived as an attempt to change the behaviour of the pupils with respect to some subject matter or learning experiences.
- The behaviour is divided into three domains-cognitive (knowing), affective (feeling) and psychomotor (doing). The taxonomy of educational and instructional objectives has also been considered to be belonging these three domains.
- The taxonomy related to cognitive domain has been presented by Benjamin Bloom and his associates namely-M.D Englehart, E. J Furst, W.H. Hill (Bloom et.al 1956). The second one related to affective domain was developed by David Krathwohl, Bloom and Masia (Krath Wohl et.al 1964). The psycho-motor domain was developed by Harrow(1972) and simpson (1966).
- Taxonomy of instructional objectives in the Cognitive Domain-Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation

The taxonomy of objectives in the affective domain arranged from the lowest to the highest level of function are-Receiving (Attending), Responding, Valuing, Organizing, and Characterization by a value or value complex

- Taxonomy of Instructional Objectives in Psycho-motor Domain are-Reflex Movement, Basic fundamental movements, Perceptual abilities, Physical abilities, Skilled movement, Non discursive communication.

2.6 FURTHER READING

1) Mangal S.K & Mangal Uma (2009): Essentials of Educational Technology, PHI learning private Limited.
2) Patel R.N (1966): The concept of educational Technology.
3) Sharma A. R (2007): Educational Technology, Vinod Pustak Mandir, Agra2

2.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Instructional objectives are important because-

- Instructional objectives give direction and guide the educational efforts.
- These are the objectives which suggest the teacher in general strategies and specific activities for their attainment. Different set of objectives usually generates different strategies.
- Instructional objectives acts as a director for both teachers and students in performing the educational activities.
- These instructional objectives serve a diagnostic -prescriptive function. On the basis of these objectives, teacher can assess where they are, how much progress has been made on the part of the learners and they can act as well as plan accordingly.

Ans to Q No 2: The taxonomy of instructional objectives under cognitive domain are-

- Knowledge: It represents the lowest level of the instructional objectives belonging to cognitive domain and primarily aims for the acquisition of the knowledge concerning like-specific facts.
- Comprehension: The comprehension is based upon knowledge. If there is no knowledge, there will be no comprehension.
- Application: Knowledge is useful only when it is possible to be applied. The application of an idea, principles or theory made be made possible only when it is grasped and understood properly
- Analysis: Analysis refers to an understanding at a higher level. It is a complex cognitive process that involves knowledge, comprehension as well as application of an idea, facts, principles or theory.

- Synthesis: Synthesis calls for the creativity aspects of the cognitive abilities and hence, it may be considered definitely a higher level of learning involving knowledge, comprehension, application as well as analysis
- Evaluation: The category of the instructional objectives aims to develop in the learners the ability to make proper value judgement about what has been acquired by him/ her in the form of knowledge, understanding, application, analysis and synthesis.

Ans to Q No 2: Non-discursive communication refers to the highest level of psycho-motor behavior. The bodily movements are hereby integrated with inner feelings and effective behavior of the learner. In this way, the non-discursive communication may be defined in terms of the overt behavior activities related to communication of affective behavior feeling or emotion.



2.8 MODEL QUESTIONS

A. Short Questions (Answer each question in around 150 words).

Q 1: What is instructional objectives?

Q 2: State four importance of instructional objectives

Q 3: What are the purposes of instructional objectives?

Q 4: What is meant by Taxonomy of instructional objectives?

Q 5: Who presented the most popular taxonomy of instructional objectives?

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: Differentiate between general objectives and instructional objectives.

Q 2: Discuss the Taxonomy of Instructional Objectives in Cognitive Domain with suitable examples.

Q 3: Discuss the Taxonomy of Instructional Objectives in affective Domain.

Q 4: Discuss the Taxonomy of Instructional Objectives in psycho-motor domain as given by Harrow.

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UNIT 3: INSTRUCTIONAL TECHNOLOGY

UNIT STRUCTURE

3.1 Learning Objectives

3.2 Introduction

3.3 Meaning and Definition of Instructional Technology

3.4 Nature and Scope of Instructional Technology

3.5 Main Features of Instructional Technology

3.6 Advantages of Instructional Technology

3.7 Aims and Objectives of Instructional Technology

3.8 Educational Technology and Instructional Technology

3.9 Let Us Sum Up

3.10 Further Reading

3.11 Answer to Check Your Progress

3.12 Possible Questions

3.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the meaning and definition of instructional technology;
- analyze the nature of instructional technology;
- examine the scope of instructional technology;
- understand the similarities and difference between educational technology and instructional technology.

3.2 INTRODUCTION

Survival in the modern world is becoming possible only by knowing more. Man makes progress on the basis of what he knows, what he thinks, what he can do and what he actually does with his physical and human resources. At present it has become important to improve the standard of education by raising the quality of instruction to meet the ever growing demands of the society. The instruction has significant role in human learning because most of the human learning is accomplished through instruction

while animal learning through conditioning. The systematic action which induce learning is known as instruction. The instruction stands for development of knowledge and beliefs. Instructional technology has come to our help in enhancing the learning opportunities and systematizing the instructional process for greater efficiency in teaching as well as learning. Instructional technology to reach large numbers in remote and inaccessible areas, remove disparity in educational facilities to the disadvantaged and provide individualized instruction to learners conveniently suited to their needs and pace of learning.

3.3 MEANING AND DEFINITION OF INSTRUCTIONAL TECHNOLOGY

Instructional technology is a newer concept in education. The results of teaching and learning whether formal or informal are called education. Education is literally a comprehensive process and imparting instruction in one of the sub-process of achieving the goals and objectives. The term instructional technology came into being in the late 1960s and James D. Finn Professor at the University of California is considered to be proponent of this term. During those years the term in use was audio-visual media, which included radio and television films. But over a period of time new technologies came into being and found its place in education; and this trend is continuing. Most of the new technologies that arrives were imported to education. There is a technology was developed to deal issues in education. Accordingly technology of instruction may be considered as one of the parts and sections of the entire event relating to educational technology. In a strict sense, instructional technology is concerned with determining and providing appropriate stimuli to the learner to produce certain types of responses for making learning more effective. Instructional technology means a net work of techniques or devices employed to accomplish certain defined set of learning objectives. Instructional technology implies the application of psychological and scientific objectives of learning. The most important example of instructional technology is 'programmed

instruction'. The programmed instruction and instructional technology can be used interchangeably.

The use of instructional technology can systematize the process of teaching-learning in both formal and informal teaching situations. The extension programmes can be improved if they are planned and produced based on the principles of instructional technology by invoking appropriate media and including some means of feedback.

Instructional technology can be well understood by going through the following definitions:

- E.E. Haden opined, 'Instructional technology is that branch of educational theory and practice, concerned primarily with design and use of messages which control the learning process.'
- The definition given by Unwin (1969) described instructional technology as: "The application of modern skills and techniques to requirements of education and training (instruction). This includes the facilitation of learning by manipulation of media and methods and the control of environment."
- As defined by S.M. Mc Murin (1970), "Instructional technology is a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of human learning and communication, and employing a combination of human and non-human resources to bring about more effective instruction."
- Sharma (1989) defines instructional technology as a network of techniques or devices employed to accomplish certain defined set of learning objectives.
- AECT (Association for Educational Communications and Technology) has defined instructional technology as, "the theory and practice of design, development, utilization, management and evaluation of processes and resources for learning."

Instructional technology applies the principles and theories of psychological learning to get deep insight into the content, structure and sequence of instruction to develop instructional resources for

attaining desired learning outcomes. In other words, instructional technology works at shaping the instructional uses of the materials to turn them into instructional resources.

The focus of instructional technology is in using tools to facilitate student learning. It is not simply application of tools but beyond that as well. The tools that are being used by teachers for instruction are wide and varied, and range from writing boards to the iPad. It includes a range of tasks, such as designing and organizing the teaching content in relation to the tools being used for effective learning. In case the teacher is not able to achieve the desired outcome then he/she may analyse, modify the design, reorganize the content, and change the tools by going through a number of steps similar to the steps followed in action research.

In a nutshell instructional technology means development of instruction with media for effective teaching-learning process.

Further, Instructional technology is concerned with determining and providing appropriate stimuli to the learner to produce certain types of responses for making learning more effective.

Assumptions:

The instructional technology involves the following assumptions:

- The content matter can be divided into its elements and each element can be presented independently.
- The external learning conditions can be created by arranging the elements in a logical sequence.
- The appropriate reinforcement can be provided continuously by the use of instruction.
- The student can learn according to his needs and rate of learning.
- The strategies and tactics of instruction can be used for achieving certain well defined set of instructional objectives.
- The student can learn successfully without the physical presence of a teacher.

The instructional technology involves the strategies and tactics which can be used outside and inside the classroom teaching. Teaching is an

instruction but the instruction is not the teaching. The instructional technology can consist of the following content:

- Meaning and definition of Instructional Technology.
- Definition of Programmed instruction and its origin.
- Meaning, assumptions and structure of linear programming and its principles.
- Definition, assumptions, principles and structure of branching programming.
- Meaning, assumptions, principles and instruction of mathematical programming.
- Learner controlled instruction and computer assisted instruction.
- Development of Programmed Instruction Material.
  - Planning
  - Writing Frames
  - Evaluation.
- Adjustive devices for controlling individual differences.
- Priming and prompting devices.

3.4 NATURE AND SCOPE OF INSTRUCTIONAL TECHNOLOGY

Extension education is the process of teaching rural people how to live better by learning ways that improve their farm, home and community institutions. Since learning and teaching are always the keys to education, extension educators must understand at least the elementary characteristics of the process and be able to apply them in their work with people. The following inter linked components represents the nature of instructional technology:

- Teacher-learner friendly: It creates congenial environment for teaching and learning.
- Goal directive: The instructions designed clearly indicates the intended behavioral change in the learner.
- Effective communication tool: It is a composite of all the elements of communication.

- Curriculum Reform: It is an effort towards making learning effective.
- Sequential learning: Planning allows linear learning both vertically and horizontally.
- Systematic application: Accessing all available resources and scientific knowledge.
- Composition of hardware and software: Written materials and soft devices will be made accessible.
- A process of improving learning methodology: Makes learning very participate due to provision of continuous stimuli and response.
- Supplement and support the efforts of the teacher: It does not replace the teacher but supports teaching in creating teaching and learning environment.

The scope of instructional technology are as follows:

- Determination of Objectives: Instructional technology provides different methods and techniques for writing instructional objectives in behavioral terms such as Bloom Taxonomy, Magar's Approach and RCEM Approach. The needs and requirements of the people and hence education need be revised from moment to moment. Instructional technology helps in fixing-up the right objectives in the light of the changed environment.
- Improvement in Teaching Learning Process: It helps in improving the teaching learning process and makes it more purposive. It tries to discuss the concept of teaching, analysis of teaching process, variables of teaching, phases and levels of teaching, principles of teaching, maxims of teaching and learning.
- Development of Teaching Learning Materials: Teaching learning materials are also as important as anything else in the teaching learning process. In this age of science and technology, the materials of teaching cannot be unscientific. Everything of the society including values of life need be reflected in the materials. Only right type material will be able to modify the behavior of the learner suitably making him a fit person for the society.

- Improvement in Teacher Training: The change of environment with new curriculum and new materials need be handled by the teachers. The teachers equipped with old strategies and methodologies of teaching will remain misfits.

Right type of training to the teachers is the need of the hour. Instructional technology can render its valuable help in the training of teachers also. The use of video tapes and close circuit T.V. will help the teachers to remodel and reshape their teaching behavior suitably.

It includes micro teaching, simulated teaching, team-teaching, teacher effectiveness, modification of teacher-behavior, classroom interaction and interaction analysis, etc.

- Development of Teaching Learning Strategies: A strategies plays an important role in the hands of a teacher in every learning situation. The strategy has to be the right one which should be according to the materials and is able to bring about effective teaching-learning.

The different strategies are being evolved by educational technology. The knowledge of those strategies is a must for every teacher. Then only the teacher will be able to do justice to their jobs.

- Proper Use of Audio Visual Aids: Audio-visual aids always played an important role in the teaching-learning process. They need be used according to the times.

The software aids, the hardware aids, the computer and other such appliances, equipments etc., have to be used in the present type of teaching -learning environment. Computer assisted instructions will help the learner as well as the teacher to achieve the goals of education more conveniently.

- Utilization of the Sub-System of Education: Instructional Technology considers education as a system operating in a systematic and scientific way for the achievement of educational objectives.

For the coverage of its systematic approach, it tries to include the topics dealing with the theory and principles of a system approach, explaining education as a system, its different sub-systems in terms of input and output. It is helpful in solving scientifically educational administrative problems with the help of system analysis.

- Development of Curriculum: Instructional technology is concerned with the designing of suitable curriculum for the achievement of the desired objectives.

It is helpful in describing the ways and means of the selection of suitable learning experiences, organization of the contents in a suitable framework in order to bring better results. It provides the scientific foundation to education as well as develops theories of teaching and learning.

- Proper Use of Hardware and Software: These day's hardware and software are playing an effective role in the attainment of educational objectives. Instructional technology helps in the proper use of these aids. It tries to describe these resources in terms of their specific functions, their solution, proper handling and maintenance.
- Provide Feedback: It provides an appropriate feedback to the learners as well as teachers for bringing necessary improvement at the preparatory and implementation stages of their specific acts.

For this purpose, instructional technology discusses the ways and means of suitable evaluation techniques, their planning, development selection and appropriate use in relation to the objectives of teaching-learning system.

In this way Instructional Technology is concerned with all those who are concerned in any way, directly or indirectly, to the processes and product of education

It teaches the teachers the art of teaching, the learners the science of teach the educational planners the structure of planning and administrators or managers the skill of managing or administering the task of teaching and learning.

It works for the individualization of instructions as well as for improving the group dynamics of the class-room.

Therefore, in this way the scope of the instructional technology should not be confined to the limited boundaries, but it should be left free for the necessary expansion and development for carrying out its mission, tasks and objectives.



CHECK YOUR PROGRESS

Q 1: The term instructional technology came into being in the late_____ (Fill in the blanks)

Q 2: Who is the first proponent of Instructional Technology?

.....

Q 3: Define Instructional Technology.

.....

Q 4: Write three assumption of instructional technology.

.....

3.5 MAIN FEATURES OF INSTRUCTIONAL TECHNOLOGY

- The cognitive objectives can be achieved effectively by the use of instructional technology.
- The learner gets an opportunity to learn according to his own pace. Thus, the individual differences are controlled in this technology.
- The right responses of the students are confirmed for providing the reinforcement continuously.
- The instructional technology incorporates the psychology learning theories and principles.
- The learning external conditions, contiguity practice and reinforcement are created with the help of instruction.
- The instructional theory may be developed by using this technology in learning process.
- The instructional technology can be employed in shortage of effective teachers.
- It provides the deep insight into the content structure and sequence of its elements.

3.6 ADVANTAGES OF INSTRUCTIONAL TECHNOLOGY

The advantages of instructional technology are as follows:

- Makes the instruction more interesting.
- Delivery of instruction is more standardized.
- Learning becomes more interactive by applying accepted learning techniques.
- Quantity of learning is improved.
- Instruction can be provided as and when required.
- Help in development of positive attitude of students towards learning and to the learning process itself.
- The role of instruction can be appreciably changed in positive direction.



CHECK YOUR PROGRESS

Q 5: Write three main features of instructional technology.

.....

Q 6: The _____ may be developed by using this technology in learning process. (Fill in the blanks)

Q 7: Write four advantages of Instructional Technology.

.....

3.7 AIMS AND OBJECTIVES OF INSTRUCTIONAL TECHNOLOGY

Instructional Technology is to create engaging, effective learning experiences that cater to the needs of different individuals. It is the precise procedure of outlining, creating, assessing and dealing with the whole instructional procedure to guarantee successful and proficient learning. Below are the aims and objectives of Instructional technology:

- Analyze learner and organizational needs.
- Determine instructional goals and objectives
- Construct a method for evaluating learner achievement.
- Design and select instructional strategies.
- Implement the training.
- Evaluate the training.

In simpler words, it is the method or style of delivering information to a student or audience. To determine the effectiveness of the delivery process, the delivery technique and audience are closely monitored. This feedback data then gives the course designers a way to measure the effectiveness of the process and a chance to improve upon it.

3.8 EDUCATIONAL TECHNOLOGY AND INSTRUCTIONAL TECHNOLOGY

Education is a fairly comprehensive process and imparting of instruction is one of the sub-processes of achieving the goals and objectives of education. Accordingly, technology of instruction may be regarded as one of the parts and sections of the entire phenomenon relating to the technology of education. Strictly speaking, instructional technology is only concerned with determining and providing the appropriate stimuli to the learner to produce certain types of responses for making learning more effective. Educational technology is concerned with the application of system approach to the study of the multi-dimensional problems of education like educational planning and organization, psychology of learning, curriculum development and course design, production of teaching-learning material, use of audio-visual methods, dissemination of information, storage and retrieval, allocation and management of human and non-human material resources, cost effectiveness of media in education and evaluation.

Educational technology provides general support to the teacher, whereas instructional technology conveys a definite part of the curriculum to the students at regular intervals.

Educational technology refers to projects that are large-scale and

involve long periods of time. Instructional technology, on the other hand, is concerned with short-term projects that are on a much smaller scale.

DIFFERENCE BETWEEN EDUCATIONAL TECHNOLOGY AND INSTRUCTIONAL TECHNOLOGY

Educational Technology	Instructional Technology
1. It has a wider concept, including instructional technology. 2. Goals are decided in the context of the needs of a nation. 3. Behavioral outcomes are determined keeping in view the ultimate needs of a nation. 4. Attempts are made to discover competencies and skills of learners all over the nation. 5. Selection of educational media is made for making teaching-learning more effective in several schools of a region. 6. Teaching material is produced on a large scale. 7. Feedback is obtained at national level.	1. It is a part of educational technology. 2. Goals are determined in the context of local needs. 3. Behavioral outcomes are determined keeping in view the specific expectations of the learners. 4. Competencies and skills of the learners of a locality are discovered. 5. A given class or school is the unit for the selection of educational media for making teaching-learning more effective. 6. Limited material is produced according to local needs. 7. Feedback is obtained at local level.



ACTIVITY 3.1

1. Analyze the above table and justify which technology you will use in your classroom.
2. Illustrate how instructional technology is used as a classroom tool to improve upon the course curriculum.



3.9 LET US SUM UP

- Instructional technology has come to our help in enhancing the learning opportunities and systematizing the instructional process for greater efficiency in teaching as well as learning. Instructional technology to reach large numbers in remote and inaccessible areas, remove disparity in educational facilities to the disadvantaged and provide individualized instruction to learners conveniently suited to their needs and pace of learning.

- The term instructional technology came into being in the late 1960s and James D. Finn Professor at the University of California is considered to be proponent of this term.
- In a strict sense, instructional technology is concerned with determining and providing appropriate stimuli to the learner to produce certain types of responses for making learning more effective. Instructional technology means a net work of techniques or devices employed to accomplish certain defined set of learning objectives.
- The extension programmes can be improved if they are planned and produced based on the principles of instructional technology by invoking appropriate media and including some means of feedback.
- Strictly speaking, instructional technology is only concerned with determining and providing the appropriate stimuli to the learner to produce certain types of responses for making learning more effective. Educational technology is concerned with the application of system approach to the study of the multi-dimensional problems of education like educational planning and organization, psychology of learning, curriculum development and course design, production of teaching-learning material, use of audio-visual methods, dissemination of information, storage and retrieval, allocation and management of human and non-human material resources, cost effectiveness of media in education and evaluation.



3.10 FURTHER READING

1) Aggarwal, J.C. 2009. Essentials of Educational Technology. New Delhi: Vikas Publishing House
2) Kocher, S.K.1985.Methods and Techniques of Teaching. New Delhi: Sterling Publishers
3) Mangal, S.K. 2001. Foundation of Educational Technology. Ludhiana: Tendon Publications.

4) Sampath, K., A. Panneerselvam, S. Santhanam. 2007 Introduction to Educational Technology. New Delhi: Sterling Publishers.
5) Sharma, K.K. 2007. Educational Technology. Delhi: Mahavir and Sons Publishers and Distributors.
6) Sharma, R.A. 2002. Technology of Teaching. Meerut: International Publishing House.]

3.10 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: 1960s.

Ans to Q No 2: and James D. Finn Professor at the University of California is considered to be proponent of this term.

Ans to Q No 3: E.E. Haden opined, 'Instructional technology is that branch of educational theory and practice, concerned primarily with design and use of messages which control the learning process.'

Ans to Q No 4: The instructional technology involves the following three assumptions:

- The content matter can be divided into its elements and each element can be presented independently.
- The external learning conditions can be created by arranging the elements in a logical sequence.
- The appropriate reinforcement can be provided continuously by the use of instruction.

Ans to Q No 5: The three main features of Instructional Technology are as follows:

- The cognitive objectives can be achieved effectively by the use of instructional technology.
- The learner gets an opportunity to learn according to his own pace. Thus, the individual differences are controlled in this technology.
- The right responses of the students are confirmed for providing the reinforcement continuously.

Ans to Q No 6: Instructional theory

Ans to Q No 7: The four advantages of instructional technology are as follows:

- Makes the instruction more interesting.
- Delivery of instruction is more standardized.
- Learning becomes more interactive by applying accepted learning techniques.
- Quantity of learning is improved

3.11 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words).

Q 1: Define the concept of Instructional Technology.

Q 2: What are the assumptions of Instructional Technology.

Q 3: Mention the main features of Instructional Technology.

Q 4: Describe the advantages of Instructional Technology.

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: What is Instructional Technology? Write the aims of Instructional Technology.

Q 2: Discuss the nature and scope of Instructional Technology.

Q 3: Differentiate between educational technology and instructional technology.

*** ***** ***

UNIT 4: TEACHING AIDS IN EDUCATIONAL TECHNOLOGY

UNIT STRUCTURE

4.1 Learning Objectives

4.2 Introduction

4.3 Meaning of Teaching Aids

- 4.3.1 Definition of Teaching aids
- 4.3.2 Nature of Teaching Aids
- 4.3.3 Qualities of Teaching Aids
- 4.3.4 Types of Teaching Aids

4.4 Meaning of Projected Aids and Non Projected Aids

4.5 Significance of Teaching Aids in Modern Education.

4.6 Let Us Sum Up

4.7 Further Reading

4.8 Answer to Check Your Progress

4.9 Possible Questions

4.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define the meaning and characteristics of teaching aids;
- explain the different types of teaching aids;
- identify the different projected and non-projected aids of teaching;
- comprehend the significance of using teaching aids in education.

4.2 INTRODUCTION

Can you remember your schooling days? We all liked the class where our teachers used some object or instruments like tape-recorder to make us listen to a Borgeet while teaching us about the contribution of Mahapurusha Sankradev or the Mathe-matics class when teachers taught us using some different technique. So most of you have seen your teachers using some devices or objects in the classroom. People learn a more when

the teaching have an extra -effect. Use of such object or instruments not only makes the classroom more interesting and meaningful. This are termed as teaching aid. In this unit, we will discuss about the concept, nature and different types of teaching aids. Moreover, we will also make discussion on different forms of projected and non-projected aids used in the classroom and its importance of teaching aids in education.

4.3 MEANING OF TEACHING AIDS

A teacher has an inherent desire that his teaching should be as effective as possible. The lesson/ content, teaches transact should be carefully attended, clearly understood, grasped and fixed in the minds of his students. In other words, a good teaching always aims at the effective communication and appropriate learning outcomes. For realizing both these objectives, a teacher has to make use of different types of aid material just as charts, maps, models, concrete objects, films, tapes, projectors, radio, television and similar other resources. All such materials, instruments and resources that aid to the effective realization of his teaching objectives may be termed as teaching aids in the field of teaching learning.

The term 'teaching aid' is composed of two words- teaching and aid. As you all know that teaching is the act of facilitating learning and aid generally means help or assistance. A teaching aid is a tool used by the teacher to help in better facilitating the teaching-learning process. It is one of the means by which teachers are able to bring life into the theoretical texts. In addition, it is a means of personification of the concrete texts in the books. Teaching aids thus prove to be a great supplement for the teachers when the reinforcement of a skill or concept is necessary. Hence, it is a means to involve the learners physically, mentally, emotionally, and environmentally. Teaching aids help the teachers to involve more and more sense organs of the learners in the learning process. As such a teaching aid can involve the learners physically through the use of his senses and acting, mentally through his use of mind and thinking, emotionally through his excitement, and environmentally by making him aware of his environment.

Teaching aids are used to enable the learners to achieve the learning objectives effectively and interestingly.

We see teachers using different kinds of aids in the classroom such as blackboard, maps, charts, globes, and pictures etc., which are traditional in nature. With the advent of science and technology, at present, electronic media have come in a big way and are apt to influence not only communication and education, but also the manner and behavior, lifestyle, attitudes, and interests of the students. These media and materials provide direct as well as vicarious or improvised learning experiences to the students at all levels of education. These include traditional aids as well as electronic media evolved from time to time in large variety and great novelty.

4.3.1 Definitions of Teaching Aids

From the above discussion, it is clear to you that a teaching aid or a tool used by teachers in any type of educational stage that helps the learners for their improvement of reading and other skills as well as provide a lively educational environment by removing the traditional monotony of the classroom. For your better understanding about teaching aid, the following definitions given by different thinkers and educationist are put here-

In the words of Burton, "Teaching aids are those sensory object or images which initiate or stimulate and re-inforce learning." Goods' Dictionary of Education defines teaching aids as "anything by means of which learning process may be encouraged or carried on through the sense of hearing or sense of sight."

Edgar Dale stated- "these aids are those device by the use of which communication of ideas between persons and groups in various teaching and training situations is helped. These are also termed as multi-sensory materials."

According to C.V. Good, "audio -visual aids are those aids which help in completing the triangular process of learning i.e. motivation, classification and stimulation."



CHECK YOUR PROGRESS

Q 1: What is teaching aid? Give some examples

.....

Q 2: State the definition of teaching aid as given by Good.

.....

4.3.2 Nature of Teaching Aids

The above discussion on teaching aids definitely helps you to comprehend the concept and meaning of teaching aid. On the basis of the discussion, we can derive some of the characteristics of the teaching aids. Some of them are-

- A teaching aid is a tool used by the teacher to help in better facilitating the teaching-learning process.
- Teaching aid is a means of personification of the concrete texts in the books.
- It gives meaning to the text.
- Teaching aids are integral part of teaching-learning process.
- It stimulate and re-inforce learning on the part of the students.
- Teachers commonly use aids in the classroom to supplement their instruction.
- Teaching aids are crucial means in realization of instructional objectives.
- These aids involve the learners physically, mentally, emotionally, and environmentally in the teaching-learning situation.
- Effectiveness of teaching as well as the effectiveness of teacher highly depends on the use of teaching aids.
- These are great supplements for the teachers.
- These aids are considered as motivational tool in the teaching-learning situation.

4.3.3 Qualities of Teaching Aids

As you have come to know that teachers commonly use aids in the classroom to supplement their instruction as well to motivate the students towards his/her teaching. As already mentioned, effectiveness of teaching depends on effectiveness of the teaching. Again the effectiveness of these teaching aids depends on certain qualities. These qualities enable students to benefit from aids. Let's discuss these qualifies of teaching aid-

- **Accessibility**: The most important factor of any educational aid's effectiveness is its accessibility to students. Educational aids must be made available to all students within a classroom.
- **Visibility:** For educational aids to be effective, they must be clearly visible. For example-Boards provide convenient visual platforms from which students observe and copy information Now a days, electronic boards, or "whiteboards," can be linked directly to a teacher's computer to display information that can be altered directly or remotely.
- **Practicability:** Teaching aids are most effective when they introduce students to knowledge and skills that prepare them for the real world. Desktop and laptop computers are useful for this purpose. They can be used to access educational and creative material while familiarizing students with technology
- **Interactivity:** Teaching aids become effective when they encourage participation from learners. The greater the degree of interactivity, the greater the benefit is to the student.
- **Usability:** Educational aid's effectiveness lies highly on the ability of the person using it. Both students and teachers must be familiar with the aid's operation and its intended purpose before it can be used effectively. For example, an art teacher who wishes to use a slide projector should be aware that such a device requires periodic maintenance and is ideally placed some distance from the screen.

4.3.4 Types of Teaching Aids

In a classroom, a teacher may use variety of teaching aids. For their appropriate use and purpose of use, it is essential for you all to know the types of teaching aids. Teaching aids and material can be classified in a number of ways. However, here we may mention two different approaches for their classification.

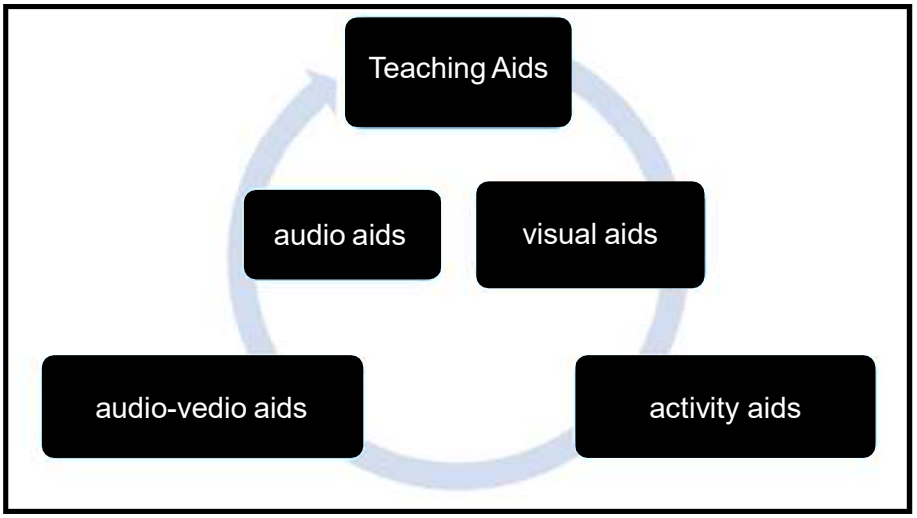
- **Traditional Approach:** This is an age-old approach, and according to this, here we can classify teaching aids into four categories-
  - Audio Aids: This category includes audio aids the aids which call upon the auditory senses and thus help the students to learn through listening. The examples are phonograph records, radio broadcasts and magnetic tape recordings.
  - Visual Aids: Under the traditional approach, another important type of teaching aid is visual aids. The teaching aids those materials which call upon the visual senses and then help the learners to learn through viewing. These aids may be further broken into subcategories: projective and non-projective aids. We will discuss about these types in the later section of this unit.

  The teaching aids, which use the sense of vision, are called Visual aids. For example, actual objects, models, pictures, charts, maps, flash cards, flannel board, bulletin board, chalkboard, overhead projector, slides etc. Out of these, black board and chalk are the common visual aids used by teacher.
  - Audio-Visual Aids: Under this category, another most significant types of teaching aid is audio-visual aids. These aids call upon both the auditory and visual senses and thus help the learners to learn through listening as well as viewing. These aids involve the sense of vision as well as hearing hence, they are called Audio-Visual aids. Examples are television, sound motion pictures, synchronized audio-slide

projection, radio vision and computer-assisted instructions.

- Activity Aids: We may place the aids that facilitate learning through sight and sound as well as through doing in this category. The examples of such aids are dramatization and role -playing, experimentation in a laboratory or workshop, etc.

Fig: 4.1 Types of Teaching aids under Traditional Approach

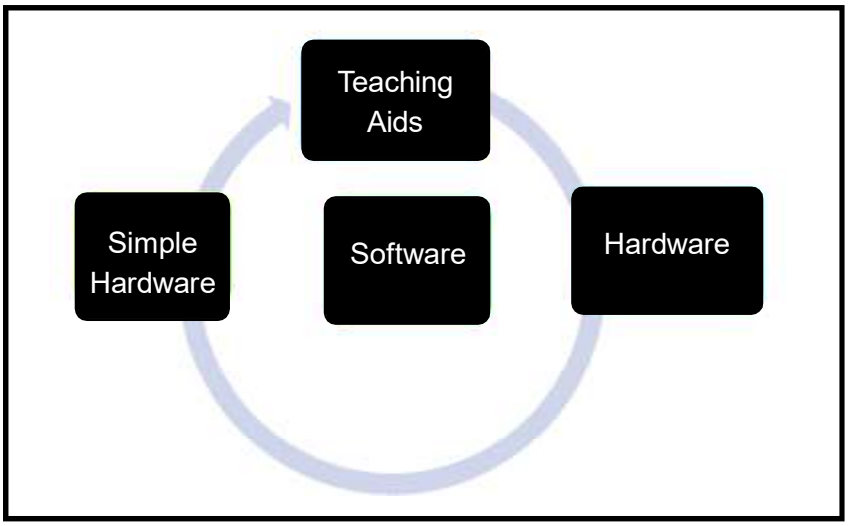


- **Technological Approach:** We have seen that the structure of classroom has been changing with the change of time and situation. Teacher now-a days no longer confine themselves in blackboard and charts or maps. Technology has touched the classroom. As we are moving towards a more digitalized society with many things becoming digital, children are being exposed to technology. Many new technical devices have been added to classroom teaching. According to this approach, the teaching aids may be classified into the following categories---
  - Simple hardware: It includes aids like-magic lantern, epidiascope, slide projectors, filmstrip projectors, opaque projectors and overhead projector, etc.
  - Hardware: Radio, television, radio-vision, tele -lecture, records player, tape recorder, motion pictures, teaching

machines, and computer are best example of hardware types of teaching aids under the technological approach.

- Software: Software types of teaching aids includes- slides and filmstrips, pictures and other printed material, graphic aids such as graphs, charts, maps, diagrams, cartoons and posters and three-dimensional objects like models and specimens.

Fig: 4.2 Types of Teaching aids under Technological Approach





CHECK YOUR PROGRESS

Q 3: State the types of teaching aid under technological approach.

.....

4.4. MEANING OF PROJECTETED AND NON PROJECTED AIDS

Besides the above mentioned types of teaching aids, there is another category of teaching aids as Projected and Non-projected aids.

- **Projected Aids:** These teaching aids are those aids that project pictures upon a screen by using a certain type of machine. They

can be used suitably for both large groups as well as small groups. Examples of projected aids are opaque projectors, slides, filmstrips, overhead projectors, LCD panels. Moreover, projected Aids include Power point presentations, slides, film-strips, filmstrip projector, films, transparencies, and overhead projector, TV/VCR as they can be projected on screen or even against white-washed wall to give an enlarged image of the material. The large, bright and colorful larger than life images make them more effective.

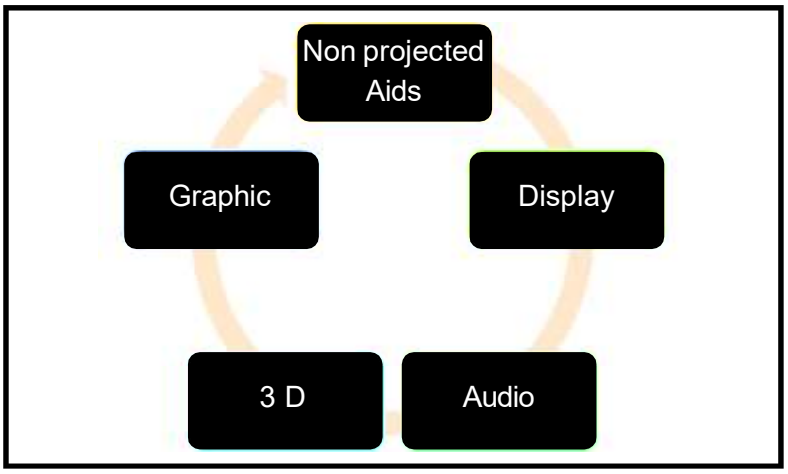
- **Some of the Projected Aids:** As mentioned above, projected aids are projected upon a screen by using certain types of machine. Some of the projected aids are discussed in detail here-
- **The television:** The television is often used as a substitute for the class room. Being a visual as well as an oral medium it always has a greater impact on the student and it can claim their whole attention. Other oral and visual aids can be employed by the teacher on television and thus the effectiveness of many other aids can be combined in one medium. For all its potential, television as a teaching medium cannot succeed on its own. The cooperation of the class teacher is essential.
- **Film strips:** This is one of the important projected aids. The projector can be loaded in advanced and 30to 40clear pictures can be projected on a white wall or screen. The images are sharp and clear and it is visible to a small group even in a class room that is not darkened. One great advantage of this projector is that the picture can be stopped at any point or as long as one likes. Thus the dimension of time is under the teachers control as the pictures can be projected at appropriate moments according to the progress of the lesson.
- **Colour slides:** They are cheaper than film strips and are cheaper to make. Any colour picture can be taken with a good camera and the resulting transparency mounted in a special cardboard or metal mounts for showing in the class. They can be projected in the screen using a film strip projector with an attachment for showing such

mounted transparencies. Up to 36slides can be loaded in advance so that they can be shown one after the other without any trouble or waste of time during the lesson. It is useful to have a rear-projection screen which enables the teacher to show the transparencies without having a darkened room. This makes it convenient for students to take down notes as the teacher is explaining the pictures to them. A further advantage of this type of screen is that the projector and the screen are close together so that the teacher can operate the former and point to the latter quite easily at the same time. They can also provide material for testing the four skills

- **The opaque projector or epidiascope:** The opaque projector or epidiascope can project any paper from a book a photograph, a chart or even small objects on to a screen is a darkened room. The chief advantage of this projector over the slide projector is that any material can be shown without any advance technical preparation. But the main shortcoming is the need for complete darkness in the room which is often difficult to achieve and which interferes with other classroom activities like writing more over the machine is very bulky. Hence its use is usually restricted to the display of illustrated materials during public lectures.
- **Overhead projector:** Overhead Projector is one among the projected aids. This aids become useful under the condition of a constant power supply. That is to say, all projection equipment requires electric power for operation. It can project the diagrams that are on transparencies, with a bright and magnified size. On transparencies, any figure, diagram, statistical information, tables, etc; could be drawn, and projected by using OHP. The projected diagram on the screen or upon a white wall before the students in a class becomes one of the best instructional aids.
- **Slide Projector:** Slide Projector is yet another projected instructional aid. It works with the power supply. Similar to transparencies in OHP, slides are used as software part here.

- **Video Cassette Player (VCP):** Sometimes pre-recorded video tapes can be played through television in the classroom. Video films on educational topics shown through television in the class room have the same effect on the students as the ordinary cinematic educational films do. Video films have the added advantage over ordinary films in that the arrangement is compact and requires little space and time for manipulation. It is the most convenient of all audio- visual teaching - learning materials
- **LCD Projector:** The LCD projector in the laboratory may be used for instruction. It can be used for presentations in the main Library or Library Classroom. Occasionally, it is moved to C-3 for presentations as well. As a general rule, teachers do not use the projector in individual classrooms.
- **Non-Projected Aids:** The visual and audio-visual aids, which are shown directly to the learners, are known as non-projected aids. Such aids include charts, diagrams, posters, flash cards, maps, cartoons, display boards, models, puppets, etc. These aids do not require projector electricity or projection screen. Such materials can be simple shown, it can be hung or touched for example- Chalkboard, Whiteboard, Flannel board, Magnet board, Charts, Posters, Pictorial Materials, and Models etc. They can hence be used with good results. They provide first hand experiences and also make the learners actively participate. They add an interest and involvement of the learner and ensure better results and longer retention. It is to mention here that non projected Aids are classified into four sub categories-

Fig: 4.3 Classification of Non-projected Aids



Some of the Non-Projected Aids

Some of the non-projected aids are discussed in detail here-

- **Black board:** Blackboard represents the oldest and most commonly used teaching aid. Although not a visual aid itself it can be used for the display of visual material in the classroom teaching. Blackboard, in fact, is synonymous to a classroom. A class can function without chair, desks or even rooms to sit in but not without the aid of a blackboard.
- **Bulletin Board:** The bulletin board is a sheet of wood, masonry cork, and celesta similar material set within a frame. The used for displaying pictures, charts, posters, clippings, photographs, or other learning materials, it serves as a perpetual magazine. It gives information of direct concern to the pupils and taps their curiosity and desire for knowledge. It provides a practical outlet for artistic talent and creative ability. It helps to unify class sprit by creating a sense of responsibility, appreciation and accomplishment. It stimulates student's interest and enthusiasm to a particular lesson. It must be simple and must telegraph its message quickly, easily and efficiently. The material must be changed frequently. Display must be done neatly and well.
- **Flannel Board:** The flannel board is somewhat like a Blackboard. But it has added advantages of colour, movement and quick removal,

leading to more interest and more learning. Its extreme flexibility permits various arrangements to be tried experimentally. It is a very useful teaching aid, which must be tried and used effectively by language teachers. It is especially helpful in presenting events or ideas in sequence as story unfolds, a report is given, demonstration is performed, steps in process are given or basic concepts are presented in a definite order.

- **Map:** Generally maps and globes are used both in Science and Social Science subjects. They are indispensable aid in teaching many subjects particularly, Geography, History and Economics. They are defined as "the graphic visual representations of the earth's surface, or position of it. Maps may cover different themes as well as locations. They are constructed based on the information borrowed from various sources. However, map writing is a special skill which needs proper and adequate training and practice. A map will be accurate representation on plain surface in the form of a diagram drawn to scale, as, the details of boundaries of continent countries, etc. Geographical details like location of mountains, rivers, altitude of a place, contours of the earth surface and important locations can also be represented accurately with reference to a convenient scale with suitable color scheme.
- **Globe:** Globe is a spherical model of the earth. A good globe provide correct information about areas, distances, directions and geographical shapes. Even the best flat map cannot achieve accuracy comparable to that of a good globe, as a flat representation of any segment of a spherical surface involves certain unavoidable inaccuracies. The language of maps and globes is largely a language of colors and symbols, standing for locations, boundaries, rivers, routes and other features. Color helps in legibility as well as beauty in maps and globes. Some symbols on a map look like the things that they are supposed to represent like international road signs while others are rather arbitrary and pupils should be trained to interpret them.

- **Charts:** Charts are visual aids, where the diagrams have two dimensions, length and breadth. Hence these are called 2-D aids i.e., two-dimensional aids. Charts are standard equipment in any subjects that are used in classrooms. They are the cheap and best, available teaching aids. They are very advantageous, handy and can be used meaningfully. They enhance the quality of teaching-learning session. Most of the charts contain diagram or a series of diagrams. It may contain the portraits of kings, pedigree tree, flowcharts etc. Science charts usually contain scientific diagrams, where as in case of the subject mathematics, students can locate graphs, pie-charts, charts showing geometrical figures. In subjects coming under social sciences, the charts may deal with some important points written boldly, connected by means of arrows, details of certain dynasty's chronological details etc.,
- **Graphs:** Graphs are flat pictures which employ, clots, lines or pictures to visualize numerical and statistical data. Graphs are of several types, namely, line graph, bar graph and circle graph etc.
  - Line Graph: Here the data is represented with the help of simple lines horizontally or vertically drawn.
  - Bar Graph: A bar graph consists of bars arranged, horizontally or vertically from a 'Zero' base. The colour, length and size of the bats represent different variables and values.
  - Circle Graph: It is also known as Pi- Graph. Here the data is represented in a circle; it may make use of different colours to represent different variables.
- **Model:** Models are substitutes of real things and it is a three-dimensional representation of the real thing. Hence they will be concrete in appearance. Through its concrete appearance, a model helps in clear understanding of structure or functions of a real thing. It is also said that, a model is the replica of original things. It is the miniature of the original one, for gigantic original things.

4.5 SIGNIFICANCE OF TEACHING AIDS IN MODERN EDUCATION

Teaching aids are integral part of the teaching-learning process. They are inseparable part for every teacher. Everything is changing with the changes of time. The need and expectation of the students as well as parents have changed. Teaching is not an easy task. Teaching does not merely mean imparting content knowledge to the students. It is much more than that. Motivating the students towards the teaching and retaining them on a particular track is the toughest job, a teacher has to carry along with teaching. Different teaching aids serves as the best supplement for the teacher to meet the changing needs of the students. Moreover, we are moving towards a more technological society with many things becoming digital, children as well as teachers are being exposed to technology. Video games and iPods are now interesting playthings for the learners. Therefore, they might feel bored with the traditional lecture method of teaching, which is quite common even today. Teaching aids improve the quality of education by making it interesting for the learners. In the modern-day education system, teaching aids have become a norm in the classroom. The traditional classrooms had only blackboard and chalk as the teaching aids, but in modern classrooms, we find white and smart boards, LCD projectors, Computers and laptops, screens, etc. The teachers are expected to focus on the fact that students grow with technology, and therefore, integrating the same into the curriculum and teaching strategy is very important .It simplifies teaching-learning process. As such, teaching aids are significant in modern education.

The following points will help you to realize the significance of teaching aid in modern education-

- **Strengthen Learning:** Teaching aids are an integral component in any classroom. Teaching aids helps the learners to improve reading comprehension skills, illustrating or reinforcing a skill or concept, differentiating instruction and relieving anxiety or boredom by presenting information in a new and exciting way. Teaching aids

also engage students' other senses since there are no limits in what aids can be utilized when supplementing a lesson. Thus it strengthen learning on the part of the students.

- **Improved comprehension:** Teaching aids are helping teachers to close the gap and improve the reading comprehension skills of their students. Using teaching aids like-magazine and newspaper articles, prints ads and even comic books assist in helping students comprehend text and improve their comprehension skill.
- **Reinforcing tool:** Teaching aids prove to be a formidable supplement for teachers when the reinforcement of a skill or concept is necessary. It not only allows students more time to practice, but they also present the information in a way which offers students a different way to engage with the material. Teaching aid acts as a reinforcing tool for the teacher.
- **Individualized learning:** It is important for teachers to reach all learners in a classroom. Therefore, the use of teaching aids facilitates this objective by assisting teachers in differentiating instruction. Using aids such as graphs, charts, flashcards, videos, provides learners with visual stimulation and the opportunity to access the content from a different vantage point. This gives each learner the opportunity to interact with the content in a way which allows them to comprehend more easily.
- **Lively learning environment:** Teaching aids help to make the learning environment interesting and engaging for the students. Teaching aids are improving the quality of education in today's schools. Moreover it provides students with the sense of excitement they desire.
- **Realization of educational objectives:** Teaching aids help the teacher to realize both the general and instructional objectives of teaching. Using different types of teaching aids not only motivates learners but also facilitates learning.
- **Real knowledge provider:** Teaching aids are considered as real knowledge provider tool. When a teacher uses different kinds of

teaching aids, it encourages their sensual learning. As we know that senses are the gateway of knowledge as such, knowledge gained through visual, audio or audio-video effect, provides the learner a concreate knowledge as well as the real knowledge.

Teaching aids are becoming the norm in the classroom. As traditional classrooms with blackboard and chalk become a thing of the past, and smart classrooms become the norm, teaching aids are growing in popularity and advancement. Blackboards are being replaced with white and smart boards. TVs are being replaced with LCD projectors and screens. And educators are becoming more focused on students growing with technology and integrating it into the curriculum.



4.6 LET US SUM UP

After going through the unit, we can summarize it as-

- A teaching aid is a tool used by the teacher to help in better facilitating the teaching-learning process.
- A teaching aid can involve the learners physically through the use of his senses and acting, mentally through his use of mind and thinking, emotionally through his excitement, and environmentally by making him aware of his environment.
- In the words of Burton, "Teaching aids are those sensory object or images which initiate or stimulate and re-inforce learning."
- The effectiveness of these teaching aids depends on certain qualities like-accessibility, usability, practicability, interactivity.
- Teaching aids and material can be classified in a number of ways. However, here we may mention two different approaches for their classification. They are-traditional approach and Technological Approach.
- The types of teaching aids under traditional approach are- Audio Aids, Visual Aids, Audio-Visual aids, Activity Aids.
- The types of teaching aid under technological approach are-Simple Hardware, Hardware and Software.

- Projected Aid are those aids that project pictures upon a screen by using a certain type of machine. Examples of projected aids are opaque projectors, slides, filmstrips, overhead projectors, LCD panels.
- The visual and audio-visual aids, which are shown directly to the learners, are known as non-projected aids
- Examples of non-projected aids are charts, diagrams, posters, flash cards, maps, cartoons, display boards, models, puppets, etc.
- Everything is changing with the changes of time. The need and expectation of the students as well as parents have changed.
- Different teaching aids serves as the best supplement for the teacher to meet the changing needs of the students. Moreover, we are moving towards a more technological society with many things becoming digital, children as well as teachers are being exposed to technology.
- Teaching aids are becoming the norm in the classroom. As traditional classrooms with blackboard and chalk become a thing of the past, and smart classrooms become the norm, teaching aids are growing in popularity and advancement.
- The teaching aids are significant in modern education as it strengthen learning, improves comprehension, act as reinforcing tool and serves individualized learning.



4.7 FURTHER READING

1) Kulshreshtha and Kulshreshtha (2016). Foundations of Educational Technology. Meerut: R. Lall Book Depot.
2) Mangal and Mangal (2009). Essentials of Educational Technology. Delhi: PHI Learning Private Limited.
3) Sampath ET. Al (2004). Introduction to Educational Technology. New Delhi: Sterling Publishers Private Limited.
4) Sharma, A. R. (1992). Educational Technology. Agra: Vinod Pustak Mandir.
5) Sharma, R. A. (2012). Educational Technology and Management. Meerut: R. Lall Book Depot.

4.8 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: A teaching aid is a tool used by the teacher to help in better facilitating the teaching-learning process. It is one of the means by which teachers are able to bring life into the theoretical texts. Examples of teaching aids are-blackboard, maps, charts, globes, and pictures, tape-recorder etc.

Ans to Q No 2: Regarding teaching aid, C.V. Good states- "audio -visual aids are those aids which help in completing the triangular process of learning i.e. motivation, classification and stimulation."

Ans to Q No 3: The types of teaching aid under technological approach are-

- Simple Hardware
- Hardware
- Software

4.9 MODEL QUESTIONS

A. Short Questions (Answer each question in around 150 words).

Q 1: What is teaching aid?

Q 2: Why teaching aids are important?

Q 3: What are the types of teaching aids?

Q 4: What is projected aid? Give example.

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: State the nature of teaching aid. Discuss the qualities of teaching aid.

Q 2: Elaborate the teaching aids under the traditional approach with example.

Q 3: Discuss the projected and non-projected aids mentioning some of them.

Q 4: Why is it essential for a teacher to use teaching aid in the classroom?

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UNIT 5: TEACHING STRATEGIES

UNIT STRUCTURE

5.1 Learning Objectives

5.2 Introduction

5.3 Meaning of Teaching Strategies

5.4 Special Features and Characteristics of Teaching Strategies

5.5 Different Types of Teaching Strategies

- 5.5.1 Autocratic Style of Teaching Strategies.
- 5.5.1(I) Lecture Strategy
- 5.5.1(II) Lesson Demonstration
- 5.5.1(III) Tutorial
- 5.5.1(IV) Programmed Instruction
- 5.5.2 Permissive Style of Teaching Strategies.
- 5.5.2(I) Question-Answer Strategy
- 5.5.2(II) Heuristics
- 5.5.2(III) Project Teaching Strategy
- 5.5.2(IV) Review Strategy
- 5.5.2(V) Group Discussion
- 5.5.2(VI) Role Playing
- 5.5.2(VII) Assignment
- 5.5.2(VIII) Discovery
- 5.5.2(IX) Computer assisted Instruction
- 5.5.2(X) Brain Storming

5.6 Model of Teaching

5.7 Meaning and Definition of Model of Teaching

5.8 Characteristics of a Model of Teaching

- 5.8.1 Concept Attainment Model
- 5.8.2 Inquiry Training Model
- 5.8.3 Glasser's Basic Teaching Model

5.9 Let Us Sum Up

5.10 Further Reading

5.11 Answer to Check Your Progress

5.12 Possible Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the meaning and definition of teaching strategies;
- analyse the nature and characteristics of teaching strategies;
- identify different types of teaching strategies;
- examine the models of teaching.

5.2 INTRODUCTION

Teaching is not everybody's cup of tea to take a sip. It is an art and skill to be learnt. It requires the knowledge of subject content, method, techniques and teaching aids to be used for making teaching interesting and effective. The selection to this method and techniques depends on nature of task, learning objectives, learner abilities and students' entering behaviour.

The learning objectives and task analysis provide the basis for effective presentation of effective presentation of teaching. In order to bring desirable change in behaviours of the learner, teacher has to employ the devices, teaching strategies and teaching tactics.

5.3 MEANING OF TEACHING STRATEGIES

The term teaching strategy, in its simple meaning, stands for the type of strategy used by the teacher in carrying out his teaching or instructional work. The word strategy, in its etymological derivation, owes its origin from a Greek word strategia and may be defined as plan and specific ways devised and employed for the realization of a goal. Strategy, as a term is quite in vague in military science and welfare. Here, it stands well for the effective plans, means and ways derived and employed for winning a war. A chess player may also be said to employ for winning his game. In the same way, a teacher may also need the use of strategies for carrying out his task of teaching as effectively as possible.

Thinking in this way, we may now be in a position to view the term teaching strategy in the following words:

Teaching strategies may stand for the plans, means and specific ways specially devised and employed by the teachers for guiding, directing and showing path to the learners for the realization of the set instructional or teaching-learning objectives.

A similar meaning for the term teaching strategies has also been attributed by the famous writers, E.Stones and S.Morris (1972) in their book Teaching practice: Problems and Perspectives.

They write, "Teaching strategy is a generalized plan for a lesson which includes structure, desired learner behaviour in terms of goals of instruction and an outline of planned tactics necessary to implement the strategy."

5.4 SPECIAL FEATURES AND CHARACTERISTICS OF TEACHING STRATEGIES

Based on the discussion on the meaning of the term teaching strategies, we can draw the following conclusions about the special features, characteristics and nature of teaching strategies:

- Teaching strategy stands for a generalized plan, ways and means for carrying out the task of teaching, i.e. more specifically for teaching a particular lesson.
- Teaching work/lesson is directed towards the realization of the set teaching-learning objectives.
- Teaching strategies is devised and employed to help the learners in the realization of the set teaching-learning objectives.
- Teaching strategy brings out a scheme, some programme or teaching-learning structure, which, if followed, may help in the better realization of the set teaching-learning objectives.
- The strategy requires a number of well-planned tactics for its effective implementation. In other words, teaching tactics are the essential components of a teaching strategy.



CHECK YOUR PROGRESS

Q 1: Etymologically, the word strategy is derived from the _____ word. (Fill in the blanks)

Q 2: What is teaching strategy?

.....

Q 3: Write three characteristics of teaching strategy.

.....



ACTIVITY 5.1

1. Define teaching strategies in your own words.
2. What type of teaching strategy is followed by your teacher in the classroom teaching learning process? Illustrate few of them.

5.5 DIFFERENT TYPES OF TEACHING STRATEGY

Teaching strategies can be classified under the following two heads:

- Autocratic Style
- Permissive Style

5.5.1 Autocratic Style of Teaching Strategies

The autocratic style of teaching is traditional. These strategies achieve different objectives more than permissive styles of teaching strategies. The autocratic style strategies are content centred and teacher remains more active and students are passive listeners. The autocratic teaching strategies realise cognitive and effective while permissive teaching strategies tend to achieve effective objectives. The main emphasis is on presentation. These strategies do not consider the student abilities, interests and personality of the learner. There is no freedom for the learner in the teaching process.

These are highly subjective and conventional styles of teaching process. These are highly subjective and conventional styles of teaching strategies. A detail description of such strategies have been given here.

5.5.1(i) Lecture Strategy

It is the oldest teaching method given by Idealistic Philosophy. It is still the most important teaching method in our schools. It is one of the autocratic teaching strategies. The lecture is often considered a communication strategy which has the following principles:

- **Principles of teaching:**
  - The content is presented as a whole.
  - The main stress is on presentation.
  - The students learn through listening.
  - The subject-content is correlated with other subjects.
  - The new knowledge is linked with student's previous knowledge.

5.5.1 (ii) Lesson Demonstration

The lesson demonstration strategy is the traditional classroom method which used by teacher-educators during teaching practice. As a technique it is less autocratic than a lecture, but considerably passive than a discussion. It has the following principles:

- **Principles:**
  - The skill may be developed by imitation
  - The perception helps in imitation.
- **Applications:** It is mainly used as teaching strategy for average and below average students or untrained and experienced teacher. The learner's cognitive and psychomotor objective can be realised. It is more useful for pupil-teachers to develop their own lessons in classroom teaching.

5.5.1 (iii) Tutorials

Tutorial strategy is considered both autocratic and permissive types of teaching. It is generally considered to be one of the most valuable educational experiences. Lecture strategy is followed by tutorials because individual difficulties are not solved in a lecture. Tutorials are highly individualised type of teaching. Following are the principles:

- **Principles:**
  - It considers the individual differences.
  - It establishes class report with the learner.
  - It provides educational guidance.
  - It organizes remedial help to the learner.

5.5.1 (IV) Programmed Instruction

Programmed instruction is a new strategy of teaching. It has revolutionized the process of teaching and learning. It is also known as individualized instruction. Programmed instruction is an autocratic style of teaching strategy. The responses of the learner are controlled by the programmer. The learner does not get freedom to respond, but it provides an opportunity to each learner to pace according to his own capacity and ability. It is based on the following principles:

- **Principles:**
  - Principle of small steps.
  - Principle of active responding.
  - Principle of immediate confirmation
  - Principle of self placing, and
  - Principle of self testing.

5.5.2 Permissive Style of Teaching Strategies

The permissive style of teaching strategies is based on 'modern theory of organization of task and relationship centre." This style seems less conventional. It is mainly child-centred: content is largely

determined by the pupils. The affective objectives are mainly achieved by permissive style strategies. These strategies create situations for students and teacher interaction and both remain active in teaching. Teaching is organised with the consideration of students' interest, abilities and values. These strategies encourage the creativity of the pupils.

5.5.2 (i) Question- Answer Strategy

The Socratic Method is known as question-answer method. It is developed by the famous philosopher Socrates. He assumes that all knowledge is within the learner and teacher has to unfold it. He further assumes that teacher should present the subject-matter in such a way that learner can recognize the truth and he can identify himself with it. It has the following principles:

- **Principles:**
  - Theory of unfoldment: All knowledge is within the learner, teacher cannot teach any new knowledge.
  - The knowledge can be emitted by linking the question with his answer.

5.5.2 (ii) Heuristic

The term 'Heuristics' has been borrowed from the word 'Heurica'. It means I discover or investigate. The purpose of communication is to develop the tendency of investigation. Armstrong is the exponent of this strategy. It is based on the assumption of Herbert Spencer that the learner should be told as little as possible and he should be encouraged to learn himself as much as possible. It has the following principles:

- **Principles:**
  - Developing problem-solving tendency.
  - Developing logical and imaginative thinking ability.
  - Developing scientific attitude towards the problem.

- Encouraging free thinking for performing the task.

5.5.2 (iii) Project Teaching Strategy

It is a new teaching strategy and it has been evolved as a result of social-tendency of education. The advocates of this opine that education should be related to life situation. It is experience-centred teaching strategy. The exponent of this project method is W.H. Kilpatrick. The main focus of this strategy is to socialize a child. It has the following principles:

- **Principles:**
  - Principle of utility. The problem of study is related with life situation of the learners.
  - Principle of readiness. The learner is active in finding out the solution of the problem.
  - Principle of learning by doing. Learner has to perform certain tasks in project strategy.
  - Principle of freedom to work. The learning situations are realistic.
  - Principle of socialization. It develops the feeling of cooperation and group work.

5.5.2 (IV) Review Strategy

It is more permissive style of teaching strategy. It develops the ability of critical thinking among pupils. The pupils remain more active in this teaching strategy and the teacher provides guidance for reviewing books and references books after introducing the topic to them. Every pupil is assigned to review an independent topic. Sometime one topic is assigned to a group of students. In this strategy the pupil has to perform much library work. In review strategy pupils are very critical about knowledge of a topic gathered from various sources.

This strategy requires self motivation and involvement in the

subject-matter. The pupils should have the patience in searching the topic from available literature and should have the feeling of cooperation to help others in this regard.

5.5.2 (V) Group Discussion

There is no comprehensive definition of group discussion but it is considered a democratic teaching strategy. The pupils are more active in it. Teacher's job is to supervise and to provide guidance for pupils activities. It is child-centred teaching strategy. It may be of two types- (1) By teacher, and (2) By the students.

- By the teacher - This type of discussion is more autocratic in style.
- By the students - In this situation discussion is more permissive or democratic in style. It is based on the following principles:

5.5.2 (VI) Role Playing

It is also termed as simulated social skill training or teaching. It is most useful for training institutions to develop social skills. It is a better strategy than lesson-demonstration, because it provides a situation to the learner to perform the task. It is based on the following principles:

- **Principles:**
  - Learning by doing.
  - Principle of immediate reinforcement.
  - Rehearsal before the actual task.
  - Social skill through group work.

5.5.2 (vii) Assignment

The assignments are also considered as one of the teaching strategy. It is most frequently used by teachers in school for every subject. This provides the situation for the assimilation of the content. It is based on the psychological learning principles which are:

- **Principles:**
  - Principle of exercise.
  - Principle of interest.
  - Principle of learning by doing.
  - Principle of Individual differences.
  - Principle of assimilation.

5.5.2 (Viii) Discovery

J.S. Bruner has developed this teaching strategy. The discovery and heuristics are used for the same meaning but they are quite different from one another. The discovery strategy is used for teaching social subjects whereas heuristics strategy is meant for science subjects. The heurism is used to provide the objective knowledge of the science concepts whereas discovery is used for the historical facts. There is a scope for direct observation in the heuristics, but discovery provides the factual information about the past events or remains or records. It has the following principles:

- **Principles:**
  - The learner remains active.
  - The student learns with understanding and insight.
  - The organisation of motives and values within the individual is relevant.
  - The principle of assimilation as described as description is followed.
  - There is scope for divergent thinking which leads to inventive solution of the problems.

5.5.2 (ix) Computer Assisted Instruction

In the beginning the computer service have been utilized in administration and industry. But computer has also influenced the education process. It can be used effectively for imparting more information's and facts to the students according to their abilities.

- **Principles:**
  - The cognitive objectives may be achieved by this teaching strategy.

5.5.2 (X) Brain Storming

It is completely permissive style of teaching strategy. It is based on the assumption that a student can learn better in group rather than in an individual study. It is a problem oriented strategy of teaching which has the following principle:

- **Principles:**
  - The higher order of cognitive objectives and effectives can be achieved.



CHECK YOUR PROGRESS

Q 4: Teaching strategies can be broadly classified under _____ heads. (Fill in the blanks).

Q 5: Write the three types of Autocratic Style of Teaching Strategy

.....

Q 6: Write the three types of Permission Style of Teaching Strategy

.....

5.6 MODELS OF TEACHING

The teaching models or models of teaching are instructional design in a way. These describe the process, of specifying and producing the particular environmental situations which cause pupils to interact in such a way that specific change or modification occurs in their behaviours.

Models of teaching suggest inter-relationships between various conditions of teaching and learning. Usually these models are prototype of

the theories of teaching. These models are the building whereas the theories of teaching are the construction plans.

5.7. MEANING AND DEFINITION OF MODEL OF TEACHING

'A model of teaching is a plan or pattern that can be used to shape curricula or courses of study, to design instructional materials and to guide instruction in the classroom and other setting.'

Classroom teaching is a social, dynamic and complex activity and the problems which a teacher faces in a classroom are also complex, varied and multidimensional in nature. These cannot be resolved by simply studying or knowing the nature of teaching, the variables of teaching and the relationship between teaching and learning. Some psychologists have tried to develop theories of teaching, yet we have not been in a position to evolve any sound theory of teaching so far. Still some thinkers of education have made attempts to develop models of teaching by examining the practical aspects of some of the theories enunciated by instructional psychologists.

These models of teaching consist of guidelines for designing educational activities and environments. These specify ways of teaching and methods of learning are intended to achieve certain kinds of goals. A model includes a rationale, a theory that justifies it and describes what it is good and why. The rationale may be accompanied by empirical evidence that it works in actual classroom situations.

Defining models of Teaching

Regarding models of teaching, some of the definitions are given below:

- Joyce and Weil (1972 p.2), "Teaching models are just instructional designs. They describe the process of specifying and producing particular environmental situation which cause the student to interact in such a way that specific changes occurs in his behaviour."
- Joyce and Weil (1972, p.3), Teaching model is "A pattern or plan, which can be used to shape a curriculum or course, to select instructional materials and to guide a teacher's actions."

- Weil and Joyce (1978 p.2), "A model of teaching consists of guidelines for designing educational activities and environments. It specifies ways of teaching and learning that are intended to achieve certain kind of goals."
- Paul D.Eggen (1972, p.12) "Models are prescriptive teaching strategies designed to accomplished particular instructional goals."
- N.K.Jangira and Azit Singh (1983, p.10), "A model of teaching is a set of inter-related components arranged in a sequence which provides guidelines to realise specific goal. It helps in designing instructional activities and environmental facilities, carrying out of these activities and realisation of the stipulated objectives."

5.8 SOME SELECTED MODELS OF TEACHING

The teaching models belonging to different families constitute a long list. In a text book of the elementary nature like the present one, it is difficult to incorporate the details of all these models. However, for the sake of illustration we would like to present a summarised description of a few teaching models. We would also make use of the six fundamental components of the model, described earlier for such description.

5.8.1 Concept attainment Model

The Concept Attainment Model of teaching was developed by Jerome S. Bruner, Jacqueline Good row and George Austin in 1956. The model emerged out of the study of thinking process in human beings. It is based on the assertion that environment is full of tremendously diverse things and would have been impossible to adjust in it if human beings had not been endowed with the capacity to discriminate and to categories things in groups. This process of classifying things in groups benefits human being in three ways. First, it reduces the complexity of the environment, second it gives the means by which we identify the objects in the world and third it reduces the necessity of constant learning.

Bruner and associates devoted their major work to the description of a process by which we discriminate the attributes of things, people and events and place them into categories.

According to Bruner categorizing activity has two components, the act of concept formation and the act of concept attainment. He maintains that concept formation leads to concept attainment. In concept attainment there is only one concept. Using clues supplied by the teacher, students try to determine the identity and definition of that concept. Burner categorises the Concept Model as follows:

- Reception Model of concept attainment.
- Selection Model of concept attainment.
- Unorganised Material Model of concept attainment.

The syntax of these will be:

Syntax of Concept Attainment Model

Phase I- Presentation of Data and Identification of Concept. (Teacher presents labelled examples. Students compare attributes in positive and negative examples. Students generate and test hypothesis. Students state a definition according to the essential attributes.)

Phase II- Testing Attainment of concept (students identify unlabelled examples as yes or no. teachers confirm students hypothesis, names, concept and restates definition according to essential attributes. Students generate examples.)

Phase III- Analysis of Thinking Strategies. (Students describe thoughts. Students discuss role of hypothesis and attributes. Students discuss type and number of hypotheses.)

Syntax

The concept attainment is processed through four phases which are described as follows:

- In the first phase data are presented to the learner. The data may be of any events or people or any other discriminatable unit. The learner delineats the units of information in various

kinds of attributes, the concept or principles or discriminatory concept which is being used on the basis of selection of units.

- In this phase, students test the kinds of concept and their attributes in a variety of materials appropriate to their age and experience. The complexity of developing concepts increases with the age of the learners. Young children may analyse the simple concepts like feeding bottle, cat, dog and family etc. Older children may examine concepts like social status and other more complex. The main purpose of this phase is to increase the knowledge of the nature of concepts and how they are used.
- The phase begins by analysing the thinking strategies to attain the concepts by the student. Some learners start with broad constructs and gradually narrow down the field or become more specific in their statement of the concept.

Social system - In the concept attainment model of teaching, the teacher is the controller of the learning. He presents the data and designates it as belonging or not belonging as an exemplar of concept but the atmosphere in the class is co-operative. The teacher proceeds closely in tune with the learner's intellectual development.

Principles of reaction - During the flow of the lesson, the teacher wants to be supportive of the students' hypothesis about concepts but to emphasise that they are hypothetical in nature and to create a dialog in which the major content is a balancing of one person's hypothesis against another's. in the later phases of the model, students analyse their concepts and strategies.

He should encourage analysis of the merits of various strategies rather than attempt to seek the one best strategy for all people in all situations.

Support system - Concept attainment lesson requires material which has been arranged so that concepts are embedded in the material. The material can be arranged so that positive and negative exemplars are pointed out to the students or so that he may have to find out the concept relevant material himself as when he analyses

a political approach. It should be stressed that the student's job in a concept attainment strategy is not to invent new concepts, but attain the ones that have previously been attained by the teacher or teaching agent. Hence, the data sources need to be known before hand.

Applicability of the model -

- The concept attainment model of teaching is widely used in language teaching. Language learning can be viewed as concept attainment in as much as the society has already devised categories of things and labels for those categories.
- Teaching of grammar or the syntactic structure of every language is done through teaching the concept of that language.
- The fundamentals of mathematics are taught through concept attainment model.
- Concept attainment model of teaching can be used in all disciplines. It can be the basis of extensive man-machine systems in modern teaching-learning process.

5.8.2 Inquiry Training Model

The Inquiry Training Model was developed by J. Richard Suchman for developing scientific inquiry training skills in the pupils. Suchman had a particular system of beliefs, which form the basic philosophy of the present model. His briefs may be summarized as below:

- All knowledge is tentative. A scientist generates a theory or principle. After some time it may be pushed aside by a new one.
- There is no one answer. We can always be more sophisticated in our explanation and most problems are amenable to several equally plausible explanations.
- In a natural process, all of us often inquiry when confronted with a problem or puzzle.
- An individual can be made consciously aware of the process of inquiry and learn to analyse his thinking strategies.
- In addition to what is already known to him, he may be taught the new strategies to enquire and explore things.

- A co-operative efforts helps in the inquiry process. As a result the development of knowledge is always facilitated by help and ideas from colleagues.

Focus. The children are very curious by nature. for satisfying their curiosity, they may be seen to be engaged in enquiry in the inquiry process, exploring and analysing the things or phenomena by themselves. The Inquiry Training Model aims to refine or improve such inquiry skills of the children through a systematic Inquiry training. It provides systematic structure within which the students have to ask questions, organise them to formulate and test hypothesis in the similar way as scholars and scientists do in organising knowledge and generate principles for explaining causation.

Syntax. Inquiry Training model consists of five phases - the initial encounter with problem, the three stages of inquiry (verification, experimentation and explanation) followed by the post mortem process (the analysis of the inquiry). These phases, along with the concerned operations are summarized as below:

Phase One Encounter with the problem

- Explaining inquiry procedures.
- Presentation of the problem or puzzled event.

Phase Two Data Gathering Process (Verification)

- Verifying the nature of objects and conditions.
- Verifying the occurrence of the problem.

Phase Three Data Gathering Process (Experimentation)

- Isolating relevant variables.
- Hypothesizing (and testing) casual relationship.

Phase Fou Formulating and Explanation

- Formulating rules or explanation

Phase Five Analysis of the Inquiry Process

- Analysing inquiry strategy and development more effective ones.

The First Phase: Encounter with the problem

In this phase, the teacher is required to explain inquiry procedure and present the problem situation. The problem situation or the puzzling event should be such that it may provide a discrepancy or appear illogical, quite contrary to the common notion of reality. It may puzzle the students because they do not know the answer. The problem selected may or may not add to knowledge of some or the other subject. However, the emphasis is always on inquiry training as explained by Weil and Joyce in the following words.

"The emphasis in this model is clearly on becoming aware of and mastering the inquiry process, not on the content and explanation of any particular problem situation. Although, the model should also be enormously appealing and effective as a model of acquiring and using information, the teacher cannot be too concerned with subject matter coverage or correctness." (1978, pp. 130-31).

Regarding explanation of inquiry process, the students may be told to observe the following rules.

- They have to phrase such questions as are answerable by a "Yes" or a "No".
- They are not to ask the teacher to explain the phenomenon to them i.e. to give directly the cause or answer of the puzzling event.
- Once a student has been called upon, he will be allowed and persuaded to ask as many questions as he wished to test his hypothesis/hypotheses.
- The students are free to consult work with one another if they wish to do so.
- Any students can test an explanation regarding his hypothesis at any time.
- Students are free to use resource books, experimental kits and other aid material, if they feel the need of doing so.

Phase Two and Three. These phases belong to the data gathering operations of verification and experimentation. In these operations data are gathered by the students in two ways:

- Be asking questions to be responded by the teacher in "Yes" or "No" form and.
- To conduct a series of experiments on the environment of the problem situation.

The process of verification is carried out in two steps:

- Verifying the nature of objects and events like,
- Identification of the objects.
- State of the objects or systems at a particular time (behaviour of objects under certain conditions) and
- Nature of an action or happening.

This phase requires the teacher to be aware of the type of questions to verify all aspects of the problem and change questions pattern through intervention.

The Experimental phases directed at exploration and direct testing. Here the hypothesis involving plausible explanation are formulated and tested by the students. The teacher has to remain very careful in guiding and directing the student for the rejection of the inappropriate hypothesis and broaden the pupils' inquiry for the appropriate hypothesis.

Phase Four demands from the students

- The extraction of the relevant information from the collected data and
- The formulation of an explanation of the problem or puzzling event as best as possible.

Phase Fifth requires working of the teacher and the students together for analysing one another's strategies. They can evaluate the modes of questioning and responding, the appropriateness of questions, the productivity of the lines of questioning, the information they needed but did not obtain, similarly, the suitability of the formulated hypothesis and its verification etc. may also be properly discussed and evaluated. This analysis attempts to help teachers to modify and improve the inquiry process and equip the students with appropriate problem-solving skills.

Principles of Reaction.

The particular and unique rules of thumb for responding and reacting to the action of the students in the inquiry training process may be summarized as below (Weil and Joyce: 1978, p.135).

- Insuring that questions are phrased so they can answered by a "Yes" or a "No"
- Asking students to rephrase invalid questions.
- Pointing out invalidated statements - for example, "We have not yet establish that this is liquid."
- Using the language of the inquiry process - for instance, identifying student questions as theories and inviting testing (experimenting).
- Neither approving nor rejecting student theories (hypothesis).
- Pressing students to clearer statements of theories and more support for generalizations.
- Encouraging interaction among students.

Social System

Inquiry Training Model provides high weightage to the controlling of social system. Teacher and students, however participate as equals where exchange of ideas is concerned. At every stage teacher has to respond in such a way that students may be encouraged to initiate and persuade the inquiry as much as possible. Where in the beginning the social system may be arranged as highly structured, it may be relaxed when the students seem to learn the principles of inquiry. The open environment with a possibility of proper teacher-pupil interaction and pupil-pupil interaction surely adds to the success of this model.

Support System

While working with the Inquiry Training Model, a teacher requires additional support in the form of

- A set of confronting materials
- Technical understanding of the intellectual processes and strategies of inquiry and

- Resource material bearing on the problem.

Application Context

Basically the Inquiry Training Model has been developed to provide training in systematic inquiry. It is not a method of teaching or imparting information. However, it can work well to impart knowledge concerning with subject areas particular in the field of natural sciences. Any event or topic from a curriculum area which can be converted into a problem situation or puzzle can be selected for inquiry training.

5.8.3 Glaser's Basic Teaching Model

John P. De Cecco, in his book "The Psychology of Learning and Instruction", has discussed three psychological models. They are a basic teaching model of Robert Glaser, a computer-based teaching model of Stolurow and Davis and an interaction analysis model of Flanders.

The 'Basic Teaching Model' was evolved by Robert Glaser in 1962 and is called a basic model because it presents a very basic analysis about the process of teaching in terms of the elements which constitute the teaching act.

Components of the Basic Teaching Model:

In this model the entire teaching process is divided into four parts that are given as follows:

- Instructional Objectives
- Entering Behaviour
- Instructional Procedures
- Performance Assessment

In the given diagram, the four main parts or components of the teaching process have depicted through four boxes, named A, B, C and D, with feedback loops for each one of them that indicate an inter-connection between them.

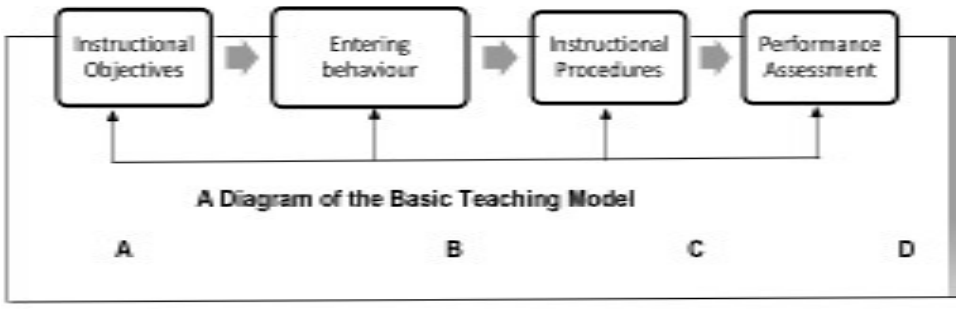


Fig. 5.2: A Diagram of Basic Teaching Model

Brief Explanation of the four Components of the Basic Teaching Model

Implications of the Basic Teaching Model for the Student-Teacher:

The prospective teachers must master the skills of formulating instructional objectives in behavioural terms. They should know how to assess the entering behaviour of their learners so that they may be able to design instruction with reference to the pupils' abilities, interests and academic attainments. They are supposed to be highly dynamic in their approach and the teaching process has to be Instructional Objectives: Instructional objectives are those that a student should attain upon the completion of a segment of instruction. In theory, objectives can vary in scope and character from the mastery of a spelling list to acquisition of complex ideas. These objectives may be stated in general, specific or even behavioural terms. In order to plan instruction systematically objectives are preferably stated in behavioural terms. According to Mager, a statement of instructional objectives stated in behavioural terms has to meet the following criteria:

- Identification of the terminal performance which instruction attempts to produce.
- Description of the important conditions under which the behaviour is expected to occur.
- Description of how good a student's performance must be to be acceptable.

By using Mager's criteria, we can prepare a useful statement

of the instructional objectives pertaining to a particular topic of learning according to the basic teaching model.

Entering Behaviour: Entering behaviour describes the pupil's level before instruction begins. It refers to what he has previously learned, his intellectual ability and development, his motivational state and certain social and cultural determinants of his learning ability. Stated simply, entering behaviour describes the present status of the student's knowledge and skill in reference to the future status that the teacher wants him to attain. Entering behaviour is, therefore, that from which instruction must always begin. Terminal behaviour is that from which instruction must always begin. Terminal behaviour is that from which instruction concludes. We can describe teaching as getting the student from where he is to where we would like him to be as moving before entering terminal behaviour.

Although this model gives priority to the selection of instructional objectives over the assessment of entering behaviour, in practice these two components must interact.

Instructional Procedures: Instructional procedures describe the teaching process in terms of the instructions the teacher makes on these procedures. Proper management of this component results in the changes in student behaviour which we call learning or achievement. Procedures must vary with the teaching of concepts, information, rules, principles, skills and problem-solving abilities which the instructors adopt according to the nature of subject-matter and entering behaviour of the learners for the attainment of behaviourally stated instructional objectives.

Performance Assessment: Performance assessment consists of tests and observation to determine how well the student has achieved the instructional objectives. If performance assessment indicates that the student has fallen short of mastery or some lesser standard of achievement, one or all the preceding

components of the basic teaching model may require re-adjustment. The feedback loops on the given diagram show how the information provided by performance assessment is fed back to each component.

Critical comments:

The basic teaching models explains almost all the important components of a sound instructional design and lay stress on goal-directed teaching as it lays stress on instructional objectives indicating terminal behaviours to be attained by the learners.

The model also, highlights the linking of instruction with already acquired behaviour of the students in terms of entering performance assessment. The model lays stress on carefully planned instructional strategies selected to match the entering behaviour and instructional objectives stated in operational terms. Thus, the emphasis in the model is on perfecting instructional procedures.

The model implies a greater emphasis on teacher competence than on his personal charisma without, of course, objecting to a useful combination of the two. Therefore, the personality of a teacher is not given undue importance in this model. There is inbuilt flexibility in the model. If the pupils are unable to attain the stipulated instructional objectives after having attended the instruction, according to this model, revision of teaching is permissible. We can adjust, and readjust all the processes of the four boxes inorder to ensure hundred percent mastery on the part of the pupils.

Constantly readjusted in the basis of the evidence available in terms of performance assessment. The teaching act in this model is not an 'influence-directed act' rather it is 'goal-directed act' capable of being modified as and when felt necessary.

Teachers are also supposed to be experts in the area of test construction. As performance assessment is an important component of this model, teachers are expected to develop to variety

of assessment tools such as quiz tests, objective-type tests, short-answer type tests and criterion-referred tests.



CHECK YOUR PROGRESS

Q 7: The Concept Attainment Model of teaching was developed by _____. (Fill in the blanks)

Q 8: What is Concept Attainment Model?

.....

Q 9: Write one applicability of Concept Attainment Model

.....

Q 10: The Inquiry Training Model was developed by _____. (Fill in the blanks)

Q 11: Who wrote the book "The Psychology of Learning and Instruction"?

.....

Q 12: The 'Basic Teaching Model' was evolved by _____ (Fill in the blanks)

.....

Q 13: Write the components of basic teaching model

.....



5.8 LET US SUM UP

- Teaching strategy is a generalised plan for a lesson which includes structure, desired learner behaviour in terms of goals of instructions and an outline of planned tactics necessary to implement the strategy. The lesson strategy is a part of a larger development scheme of the curriculum. teaching strategy involves two aspects : (i). a generalised plan for the presentation of lesson, (ii) A desired learning-behaviour in terms of goals instruction.
- Teaching strategies can be classified into two types:
  (i) Autocratic style and (ii) Permissive Style.

- Autocratic style consists of Lecture, Lesson, Demonstration, Tutorials and programmed Learning.
- Permissive style consists of question-answer heuristic, project, review, group discussion, Role-playing, assignment, Discovery, Computer Assisted Instruction, Brain storming Independent study, leaderless group and sensitivity training.
- Models of Training have been developed to help a teacher to improve his capacity to reach more children and create a wider and more diverse environment for them.
- All the models of teaching have some common identifiable characteristics which are: scientific procedure, specification of learning outcome, specification of environment, criterion of performance and specification of operations. The functions of model of teaching are: (i). Guidance, (ii). Developing curriculum, (iii) Specification of instructional material, (IV). Improvement in teaching.
- Elements of a model: (i). Focus, (ii) syntax, (iii) Principle of Reaction, (iv). Social System, (v). Support System.



5.9 FURTHER READING

1) Aggarwal, J.C. 2009. Essentials of Educational Technology. New Delhi: Vikas Publishing House
2) Kochhar, S.K.1985.Methods and Techniques of Teaching. New Delhi: Sterling Publishers
3) Mangal, S.K. 2001. Foundation of Educational Technology. Ludhiana: Tendon Publications.
4) Sampath, K., A. Panneerselvam, S. Santhanam. 2007 Introduction to Educational Technology. New Delhi: Sterling Publishers.
5) Sharma, K.K. 2007. Educational Technology .Delhi: Mahaveer and Sons Publishers and Distributors.
6) Sharma, R.A. 2002. Technology of Teaching. Meerut: International Publishing House.

5.10 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: Greek

Ans to Q No 2: Teaching strategies may stand for the plans, means and specific ways specially devised and employed by the teachers for guiding, directing and showing path to the learners for the realization of the set instructional or teaching-learning objectives.

Ans to Q No 3: Three characteristics of teaching strategies are as follows:

- Teaching strategy stands for a generalized plan, ways and means for carrying out the task of teaching, i.e. more specifically for teaching a particular lesson.
- Teaching work/lesson is directed towards the realization of the set teaching-learning objectives.
- Teaching strategies is devised and employed to help the learners in the realization of the set teaching-learning objectives.

Ans to Q No 4: Two

Ans to Q No 5: Three types of autocratic style of teaching strategy are as follows:

- Lecture Strategy,
- Lesson Demonstration and
- Tutorial

Ans to Q No 6: Three types of permissive style of teaching strategy are as follows:

- Question-Answer Strategy,
- Project Teaching Strategy and
- Review strategy

Ans to Q No 7: Jerome S. Bruner, Jacqueline Goodrow and George Austin in 1956.

Ans to Q No 8: The model emerged out of the study of thinking process in human beings. It is based on the assertion that environment is full of tremendously diverse things and would have been impossible to adjust in it if human beings had not been endowed with the capacity to discriminate and to categories things in groups. This process of

classifying things in groups benefits human being in three ways. First, it reduces the complexity of the environment, second it gives the means by which we identify the objects in the world and third it reduces the necessity of constant learning.

Ans to Q No 9: One applicability of concept attainment model are as follows:

The concept attainment model of teaching is widely used in language teaching. Language learning can be viewed as concept attainment in as much as the society has already devised categories of things and labels for those categories.

Ans to Q No 10: J. Richard Suchman

Ans to Q No 11: John P. De Cecco

Ans to Q No 12: Robert Glaser in 1962

Ans to Q No 13:

- Instructional Objectives
- Entering Behaviour
- Instructional Procedures
- Performance Assessment



5.11 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words).

Q 1: What are the special features of teaching strategies?

Q 2: What do you mean by Autocratic Style of Teaching Strategy?

Q 3: Mention some important principle of Lecture Strategy.

Q 4: Write a note on tutorial method of teaching.

Q 5: What are the advantages and disadvantages of programme instruction?

Q 6: What do you mean by Computer Assisted Instruction (CAI)?

Q 7: What are the main functions of model of teaching?

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: What is teaching strategy? Explain the different types of teaching strategy.

Q 2: Define teaching model. Write the characteristics of model of teaching.

Q 3: Discuss the various elements of concept attainment model with its classroom implications.

Q 4: Explain the inquiry training model. Discuss its various elements with classroom implications.

Q 5: What is meant by permissive style of teaching? Discuss its different types.

Q 6: Explain the components of a teaching model.

*** ***** ***

UNIT 6: COMMUNICATION AND INSTRUCTION

UNIT STRUCTURE

6.1 Learning Objectives

6.2 Introduction

6.3 Meaning and Definition of Communication

6.4 Characteristics of Communication

6.5 Importance of Communication

6.6 Communication Process

6.7 Principles of Communication

6.8 Barriers of Communication

6.9 Types of Communication

6.10 Phases of Teaching

6.11 Teaching Machines

- 6.11.1 Characteristics of Teaching Machines
- 6.11.2 Educational Advantages of Teaching Machines
- 6.11.3 Demerits or Limitations of Teaching Machines

6.12 Let Us Sum Up

6.13 Further Reading

6.14 Answer to Check Your Progress

6.15 Possible Questions

6.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define communication and instruction;
- explain the process of communication cycle;
- discuss the concept of teaching along with its different phases;
- identify the constituent parts of a teaching machine;
- discuss the role of teaching machine in improving the process of teaching.

6.2 INTRODUCTION

Communication plays an effective and essential role for running the show of any formal or informal teaching-learning process. In many of its way, teaching is communicating and in this sense, good teachers are always good communicators. It is also equally true for the learners. He who learns well is the one who participates well in the communication process. Good learners are always the good receivers and good responders. In this way communication as a vehicle or tool for running the show of teaching-learning act must always be treated as a two way process in which both the source of teaching (teacher) and the beneficiary of teaching (learner) interact well for the proper realization of the teaching-learning objectives. However, for this proper interaction teacher as well as students are required to acquire the art and technique of a good communication.

6.3 MEANING AND DEFINITION OF COMMUNICATION

Communication in its literal sense stands for the act of communing. One can communicate his ideas, thoughts and feelings etc. or transfer any type of information and knowledge to the others through this act of communication. For this purpose he may also take the help of some instruments, appliances or devices like telephone, tele printer, telegram, fax, E-mail, radio broadcasting, telecasting etc. in this sense, communication may be taken as a one side transaction of a piece of information, knowledge, ideas, thoughts and feelings from a person (source of transmission) to another person or persons at the receiving end. However, the meaning of the word communication cannot be limited to such one-way transmission. It is always a two ways affair. The source of transmission and its receiver equally share and participate in the communication process.

Etymological derivation of this term communication also supports the above line of thoughts. As commonly known the term communication

has been derived from the Latin word 'Communis' meaning 'Common'. In this sense as a verb the term communication stands for an act of sharing commonness or common understanding and experiences with others. Agreeing to such etymological explanation, Edgar Dale (1969) the Newton of audio-visual aid and instructional technology, has defined the term in the following words. "Communicating is defined as the sharing of ideas and feelings in a mood of mutuality."

Consequently, in this way communication is to be taken as a sharing process. What we know or have in ourselves in the shape of ideas, thoughts and feelings is shared with others through the process of communication. For this purpose we convey or transmit it as a source of communication or transmission through the help of some or the other media of transmission preferably in the way being well received by the receiving person or persons. The person or persons on the receiving end try to receive and respond to it for the necessary interaction with the source of transmission. In this way a chain process or cycle involving the cooperation of the source of communication and its receivers comes in to operation for the effective realization of the fruits of communication.

Definition:

Some of the important definitions of the process of communication are as follows:

According to Newman and Summer, "Communication is an exchange of facts, ideas, opinions or emotions between two or more persons."

Anderson defines "Communication is the process, by which we understand others and in turn, endeavour to be understood by them. It is dynamic, constantly changing and shifting in response to the total situation."

Hoben defines communication as "the verbal interchange of thoughts or ideas".

According to Shannon and Weaver, "Communication involves all the procedures by which one mind may affect another. This involves not only written and oral speech, but also music, the pictorial arts, the theatre, the ballet and in fact all human behaviour."

According to Merrihus, "Communication is a process of mutual exchange of thoughts, ideas, facts and emotions."

According to John Dewey, "Communication is a process of sharing experiences till it become a common possession."

6.4 CHARACTERISTICS OF COMMUNICATION

Communication has some basic characteristics, which are discussed as follows:

- **Purposeful:** Communication always involves a purpose. Whenever as idea or thought arises in the mind of a sender, he wants to communicate it. This means there is always some purpose behind it. The purpose of communication is to impact attitude and behaviour of those involved.
- **Universal:** Communication is the only way through which human beings can share information. Thus, communication is a universal process as it occurs almost everywhere.
- **Interactive:** Interaction is primary characteristic of communication in which two or more persons or group interact with each other. It may results in social interaction. Thus, it is a two-way dynamic flow of information.
- **Imperfect:** A perfect communication is never possible in reality because what a person thinks can never be exactly understood by the receiver. This is because every individual is different from the other and perfect synchronization of minds is never possible.
- **Dependent:** Communication is performed with the help of some media. Communication is now carried out through various channels or modes, ranging from sophisticated communication media and technology, to non-verbal signals. So, It is dependent on some media through which message from one person could be sent to another.
- **Complex:** Communication is a complex process which involves various steps. A number of barriers can hinder this process at both ends (sender and receiver).

- **Contextual:** Communication always takes place within a context. The context of communication has at least four dimensions: (i) physical, (ii) social, (iii) psychology and (iv) temporal. These dimensions interact and influence, and are influenced by one another.

6.5 IMPORTANCE OF COMMUNICATION

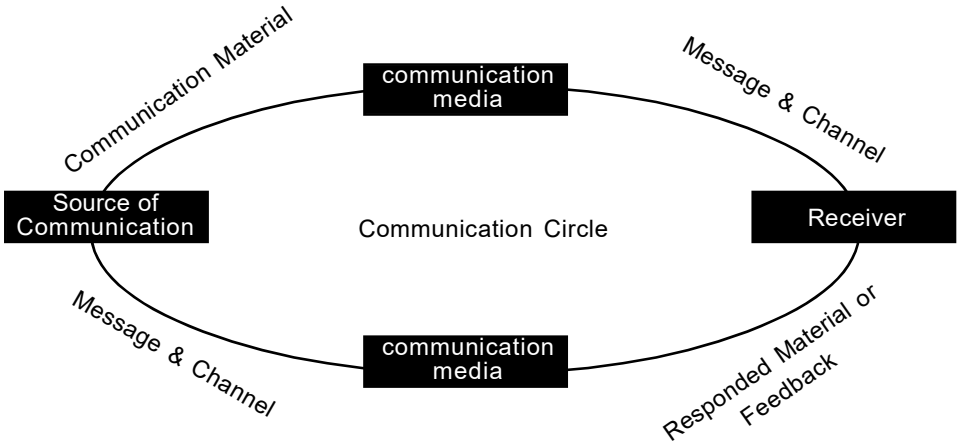
As we have already discussed, communication is nothing but transmission and understanding of message from sender to receiver. It is a very important aspect of human life because it is only through communication that human beings can interact with each other as individuals and as independent groups. It is an essential and basic process in all fields of life. Communication skills can be used virtually in every field. Effective communication is important because it allows people to lead more satisfying lives. Some other reasons which explain why communication is important are as follows:

- **Transmission of information:** Communication is must to transfer information between individuals and places. Any message which is not communicated is of no use.
- **Displaying ideas/emotions:** Whether it is written or oral form, we always express ourselves by communicating with others. Without communication, we are not able to express our feelings or ideas. Hence, communication is important to transmit emotions/ideas.
- **Education:** The whole process of education involves imparting of knowledge to students by the teacher. However, this knowledge is imparted by various media, which depend on communication. Education without communication is impossible.
- **In relationship:** Communication plays a vital role in building relationships between people. It facilitates dialogue, exchange of expression and emotions, which result in relationships. This type of communication decides the relation. It could be personal or professional.

- **Entertainment:** To break away from the daily schedule of life full of stress, entertainment is a crucial part of everyone's life. Nowadays, every source of entertainment like movies, music, television shows, games, theatre or even anecdotes narrated by people involve communication.
- **Achievements of goals:** The ability and the importance of communication become much more crucial when we are on a mission, or need to achieve a goal. Without a means to communicate, an organisation will become isolated. The ability to effectively communicate is very important to achieve the set goals.
- **Cultural promotion:** Communication offers a prospect to promote and preserve culture and traditions. It helps people in fulfilling their desire to be creative.
- **Integration:** It is with the help of communication that many people in a large number of countries all over the world, gain awareness related to each other's customs and tend to admire each other's lifestyle and culture. It progresses the activity of being integrated and tolerant with respect to each other.
- **Discussion:** The process of debating and discussing elucidate various perspectives on matters that are of interest to people. With the help of communication, the reasons for difference in opinions and imparting of new ideas to others can be pinpointed.

6.6 COMMUNICATION PROCESS

Communication as a two way process involving interaction between the two or more persons (on giving and receiving ends) is carried out in a cycle illustrated below



Illustrated as above we may notice the presence of five main components or elements in general in any process of communication namely.

- The source of communication or sender of the message.
- Contents of communication or message.
- Media or channel of communication.
- The Receiver of the communication.
- Response material or Feedback.

Let us know now about these five elements of communication.

- **The source of communication (The communicator):** The process of communication essentially starts with a source of communication. There must be somebody to initiate the process of communication. This source whether in the form of some object/event or person must be in a position to transmit information, ideas, thoughts, opinions and feelings etc. known or possessed by it with the other person or persons on the receiving end of the communication. The source of communication, person or object is generally named as 'Sender' in the language of communication technology. In the teaching learning process going inside the classroom the teacher is to be regarded as the source of communication or sender of the message where in any informal learning situation any source of knowledge (man or material) can be regarded as the source of communication.

- **Contents of communication or message:** What is intended to be communicated or transmitted by the source of communication i.e., sender from his own stock of knowledge, informal thoughts, opinions and feelings etc. to the other person or persons (receivers) is known as the contents of communication. These contents may be well organised and structured or unorganised and unstructured or spontaneous depending upon the nature and purpose of communication as well as the media chosen or situation prevalent at the time of communication.
- **Media and Channel of communication:** What one wishes to communicate to others is always communicated with the help of some or the other appropriate media or channel. The media in general takes the two distinctive forms, verbal and non-verbal. In any communication process, the sender and receiver both are forced to make use of that media or channel of communication which is mutually acceptable as well as effective.

At the onset of any communication process when one as a source of communication or sender of the message tries to convey some information or his own ideas, thoughts and feelings, he is infact motivated to transmit it to the receiver. For its transmission he first tries to organise the communication material in the proper shape and then search for an appropriate media, verbal (spoken or written words) or non-verbal (gestures, sign language, body language, morse code, etc.).

- **The Receiver of Communication:** Receiver is the person who remains at the receiving end of the communication. He is to receive the encoded intended message of the source of communication, decode it for its proper interpretation and must reach or produce a desired response (feedback) to the source of communication for maintain the proper flow of the chain of communication. In this way receiver like a far end pole is equally important for the flow of the current of communication between him and the communication or sender of the message. The communication can remain operative only if he is interested and possesses required competency to

decode, understand and effectively respond to the communicated message.

- **Response material or Feedback:** The response material or feedback may be defined as the reaction or response signals in the encoded form transmitted back by the receiver of the communicated message after its proper decoding, interpretation and understanding in order to maintain the flow of communication between him and the sender. The effectiveness in the flow of communication is dependent much upon the quality, and effectiveness of the contents of the response. It is through feedback that one may evaluate the outcomes of his communication i.e. what was intended to be communicated has or not been reached the receiver, has there been any gap in the communication process or has there been any difficulty or misgiving in the interpretation of the message. In this way, the quality of communication as a two way process may thus be properly maintained through a proper feedback from the receiver and its subsequent follow-up on the part of the sender.

6.7 PRINCIPLES OF COMMUNICATION

At the time of communicating, it is very important to consider some of the general principles of communication. These principles are the same for all human beings, no matter what ethnicity or culture they may be part of. Following are some important principles which should be kept in mind, during the process of communication:

- **Principle of mastery on language:** Verbal communication is the most widely used form of communication. It uses language to express thoughts and ideas. Mastery of language is vital for effective communication. The sender or source of communication should use the language which is easy for the receiver to understand. In a classroom, the teacher should be fluent in the language which the students understand; only then it will be possible for him to convey the message to students.

- **Principle of motivation:** The level of interest of both the source of communication and the receiver should be interested throughout the process of communication. Lack of motivation, interest and zeal on part of the sender or the receiver may adversely influence the progress of communication.
- **Principle of sharing and interaction:** During communication, it is important to be sensitive to the others and be aware of how the receiver is interpreting the message. The success of communication lies in sharing and mutual interaction between the sender and the receiver.
- **Principle of active listening:** Listening is an important aspect of communication and this role is played by the receiver of the message. To become an effective communicator, it is very important to listen to the other person. If the sender is not a good listener, it would be very difficult to understand what someone is trying to say. A lot of misunderstanding and misinterpretation can occur if there is lack of proper listening.
- **Principle of suitability of communication contents:** The content which is to be communicated should have a definite purpose, cohesiveness and usefulness for the receiver. The sender should be familiarized with the content to be communicated. On the receiver's end, the contents should be suitable enough to be grasped so that he can respond properly.
- **Principle of using appropriate channel:** Selection of the wrong communication channel can cause communication obstacle and inadequate feedback. Effective communication relies on selecting an appropriate communication for sending the message. While selecting the communication medium, one should keep in mind the purpose of the message.
- **Principle of conductive environment:** A conductive environment is a very vital constituent for facilitating effective communication. The communication process should be protected from noise, disturbance, poor pronunciation, improper ventilation, etc., because

in the presence of all these factors, communication may not be successful. Hence, to enhance the effectiveness of communication, a conductive atmosphere is necessary.

- **Principle of competency:** Competency is required at both the sender's and receiver's end in terms of communicating and receiving the desired information. Both of them should possess the communication skills which help the sender in sending the message and the receiver in the receiving the message effectively.
- **Principle of appropriate body language:** Appropriate body language also plays a very important role in the communication process. One of the most influential modes of communication in day-to-day interaction is our body language, which includes eye contact, gestures, body stance and facial expressions. Individuals with improper body language are prone to be misunderstood and do not succeed in communicating their ideas.
- **Principle of appropriate feedback:** Appropriate feedback from receiving end conveys that the message of the sender has been received and interpreted correctly. The feedback can also work in reverse order from the source to the receiver's end. If a teacher gets proper feedback from the students, it will help him understand whether the communication is effective or not.

6.8 BARRIERS OF COMMUNICATION

There are a number of factors (and many of these factors exist in day-today life as well) that can act as barriers to effective communication. Barriers of communication are as stated below -

- **Lack of Planning:** Good communication seldom happens by chance. Too often people start talking and writing without first thinking, planning and stating the purpose of message. Furthermore the personality and attributes of the person who is receiving the message also matters cause no matter how nicely the message has been delivered the receiver should be that intelligent to read it correctly.

- **Ambiguity:** Clearly, language and linguistic ability may act as a barrier to communication. If the message sent is not clear and is ambiguous then it may act as a barrier.
- **Verbalism:** Excessive verbalism can no longer be condoned, particularly in today's world of communication which offers much more effective substitutes from other avenues of expression. Such verbalism is a definitely limiting barrier of effective classroom communication.
- **Anxiety:** One of the major emotional causes of communication barriers is a student's anxiety. If a student is anxious and unsure, they're less likely to speak up in class. This is true even in situations where a student doesn't understand what the teacher is saying and needs clarification. Anxiety stops students from participating in group discussions because they don't want to be made the center of attention, and they're afraid of other people's opinions of them.
- **Language:** Language is the primary way of communication thoughts and ideas. If the teacher and the students don't speak the same language, these can be a major communication barrier. If the teacher speaks English, and the students are mostly English as Second Language students, then there will be communication problems, since the students may not understand everything the teacher says.
- **Expression:** Communication is never exact. The initiator tries to put his ideas into words, and then the recipient has to decode those words to understand the idea. When the teacher or student doesn't have the ability to choose the proper words to describe the ideas they want to convey, this will create a communication barrier in class room.
- **Day dreaming:** A common (though avoidable) barrier to effective communication occurs when the learner day dreams, that is when he turn away from the flow of classroom communication and dwells upon his own privately recalled understanding and experiences, which are more preoccupying than those which are identified with classroom activity. Students are failed to keep their full attention in

the class room, if they think the movie that was seen by them in previous night.

- **Imperceptions:** Students are not be able to understand the teacher's important class lecture if they have any physical problem. Psychological function can do nothing in this case. So students may gather knowledge very superficially in class room thus communication fails.
- **Disinterest:** Disinterest arises among the students due to the lack of available teaching materials, teaching system and efficient teacher in the classroom. To eradicate distance teacher should include some motion pictures, films, modems, specimens, film strips, charts, diagrams, tapes, records, television and many other audio visual materials. Variety in class room procedures and teaching materials usually heightens the interest and enthusiasm with which pupils approach their work.

Others barriers may be as follows:

- Economic factor;
- Mental factor;
- Educational factor;
- Organization and religious factor;
- Political factor;
- Social factor;
- Racial factor, etc.

From the above discussion we may say that communication is the unique process of our social, cultural, political; and economic development. All developmental activities largely depend upon proper communication. Classroom learning also become effective with proper communication between students and teachers. Some barriers affect in classroom communication. Audio-Visual instruction may solve these communication barriers.

6.9 TYPES OF COMMUNICATION

There is nothing in a world that would be achievable without the process of communication. There are different modes of communication, depending on the environment or situation and on the number of people involved. Let us discuss all these one by one:

- **Mode of communication:** A person can communicate with the help of both language and expression. If there is use of language, it is called verbal communication. However, communication that takes place without language, with the help of expression only is known as non-verbal communication.
  - **Verbal communication:** Language is an important factor and base of any verbal communication. Communication which makes use of oral or written form of language is termed as verbal communication. We have different types of languages like regional, national and international, for communication. In a classroom, the teacher mostly communicates verbally and writes words or sentence on the blackboard. Verbal communication with students is through questioning, lecturing, guiding, explaining or demonstrating. In this way, we can conclude that verbal communication combines both written and oral forms, which results in effective communication. for effective verbal communication, the following things should be kept in mind.
  - **Non-verbal communication:** There are many ways used by people to communicate, other than verbal communication. Messages that are conveyed through body language, facial expression or code language, without taking help of verbal or written language are known as non-verbal communication. in some cases (with people who are not able to speak and listen [dumb and deaf], mentally challenged persons or who do not know the language of the sender) use of non-verbal communication becomes a compulsion. This type of

communication very often used along with verbal communication to make it more effective. Non-verbal communication can be of following types.

- **Body language:** Feelings, thoughts or ideas can be conveyed with the help of body language. Various postures and movements of body can convey various message. Different people in different profession makes use of body language and convey the feelings like happiness, fear, anxieties, jealous, love and sympathy. A dancer while performing can convey feelings with the help of various postures. Similarly, a teacher can show love for the students, lawyers can very well use various postures to evoke the answers from their clients and so on.
- **Facial expression:** It is rightly said that face is a mirror for one's emotions. Intentions of a person can be very easily studied by his facial expressions. When a person is angry or happy, it can be clearly observed through the facial expression. These expressions are similar and universal all around the world. for non-verbal communication, these are most suitable and effective.
- **Language of eye:** Language of eyes can be declared as another important form of non-verbal communication. It is very simple and easy to understand the language of eyes. Widening or narrowing of pupils and movement of eyelids convey messages to the receiver.
- **Symbolic code language:** In news bulletin for deaf and dumb on television, special code language is used. This is easily understood by them. Even in our day-to-day activities, we use various symbols or codes to convey messages. Detective use code language to pass on secret information.

- **On the basis of number of people:** Communication can take place between two or more individuals. Hence, based on the number of individuals involved, we can divide communication into following:

- **One-to-one communication:** It occurs between two individuals. A friend talking to a student or talks between a father and a son are some examples of one to one communication. It can be both formal and informal type.
- **Small-group communication:** This type of communication occurs among than two individuals. Communication between families, neighbours and friends are example of this type of communication.
- **Public communication:** This type of communication is mostly formal and involves a number of people. Morning assemblies in schools or preaching at religious places are examples of this type of communication.
- **Organizational communication:** This type of communication occurs within the boundaries of an organization or institution, for instance, communication in hospital, army, or any educational institute.
- **Mass communication:** this type of communication is broad and it involves ways to communicate with masses. It is carried out through different types of mechanical means, appliances and mass media such as television, radio, books, videos, etc. Individuals living in any part of the world can be involved in mass communication.

- **Communication on the basis of environment:** Communication can take place in a variety of situations or environment. Depending upon the environment, we may divide communication into two types:
  - **Formal communication:** When communication takes place in a well-set environment with proper rules and regulations to achieve predetermined objectives, it is called formal communication. In events that require public speaking, mass communication, official communication is used. Here, language is used more precisely and there is a higher focus on grammar.
  - **Informal communication:** When communication is not pre-planned and it is free of rules and regulations with minimum

formalities, it is known as informal communication. In this type of communication, focus on the structure of language and grammar is very less. There is also lesser focus on non-verbal behaviour like attire, way of walking, stance, etc. Any type of communication between a group of friends outside the school or college can be taken as an example of informal communication.

- **Communication on the basis of its direction of flow in an organization:** On the basis of this criteria, there are the following two types of communication:
  - **Upward communication:** In this type of communication, message is initiated by subordinates and is received by superiors. In an organization, people in the top management use this type of communication to be aware of the needs, requirements, problems and complaints of the employees. It also helps them in sound decision-making, based on the information received from employees. This type of communication provides an opportunity to employees to communicate their issues to the top management. Upward communication takes place in meetings, counselling, correspondence, reports etc.
  - **Downward communication:** This type of communication is initiated by people at higher positions in an organization. For the success of an organization, effective downward communication is very important. The communication of management with employees is necessary for organizing, coordinating and directing the operations of an organization. Downward communication flows through speeches, instructions, meetings, telephones, letters, pamphlets, etc.



CHECK YOUR PROGRESS

Q 1: Communication has been derived from the Latin word _____. (Fill in the blank)

Q 2: Define 'Communication'.

.....

Q 3: Write any five principles of communication.

.....

Q 4: Communication is mainly divided into _____ types. (Fill in the blank)

Q 5: Differentiate between 'verbal' and 'non-verbal' communication.

.....

6.10 PHASES OF TEACHING

Teaching is considered as a social phenomenon. Teaching is an art in which a teacher influences his students and motivates them for learning. Students learn and develop according to the ideals set before them by teachers. Teaching is nothing but an organized set of activities, as a result of which pre-determined objectives are achieved.

Teaching is a complex task, for performing which systematic planning is needed. Teaching is to be considered in terms of a certain number of steps, and the different steps constituting the process are called the phases of teaching. Jackson thinks that if we are to obtain a complete description of the teaching activity, we must consider what the teacher does before and after his regular teaching in the class. Jackson divides the act of teaching into three phases of teaching as shown below

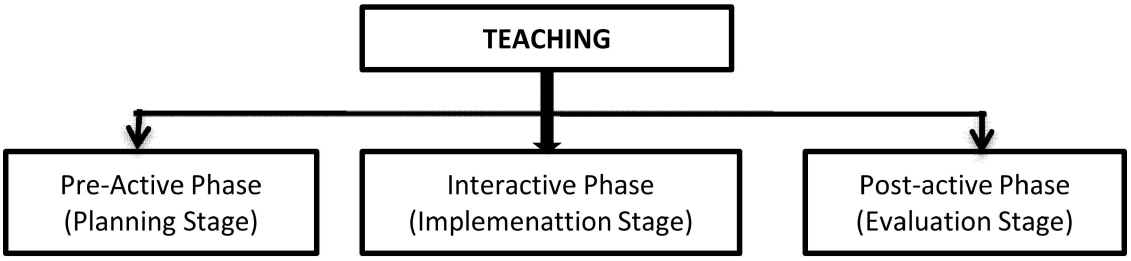


Fig. 6.2.: Phases of Teaching

- **Pre-active stage:** Before actual classroom teaching or what Jackson calls "calm" part of teaching, a teacher has to perform many tasks. These tasks include preparing lesson plans, arranging furniture and equipment within the classroom, papers, studying test reports, reading sections of a textbook and thinking about the aberrant behaviour of a particular student. These activities are crucial to the teacher's performance during regular teaching sessions.

  Operations at the Pre-active Stage: The following operations or sub-stages are involved at the pre-active phase:

  - Forming or fixing up goals.
  - Taking decisions about the content.
  - Managing or sequencing appropriate means and ways of presentation.
  - Deciding about appropriate strategies and tactic of teaching.
  - Developing teaching strategies for the specific subject matter.

- **Interactive Stage:** This is actual classroom teaching. At this stage, the teacher uses a number of strategies for achieving the goals already set. In the interactive setting, the behaviour of the teacher is more or less spontaneous. Research suggests that things happen quickly during the teaching session. For example, the elementary teacher may change the focus of his concern as many as 1,000 times daily. Amid all this hustle and bustle, the teacher often has little time to think.

While many teachers try to devote some time alone with individual students, the teacher-student dialogue is usually public rather than private. When a teacher is alone with a student, he is not faced with the

problem of control and management that frequently adsorbs a major portion of his energies in a group setting. There is a greater sense of physical and psychological intimacy between the teacher and the student during individual sessions than when the teacher is responding to the class as a group.

Operations at the interactive stage are the following:

- Selection of stimuli.
- Presentation of the stimuli.
- Feedback of reinforcement.
- Development of strategies of teaching.

- **Post-active phase:** The post-active phase of teaching is the simplest of all phases. It is nothing but the evaluation of operations involved in teaching. This phase comprises attempts made by teacher for determining the effectiveness of their teaching, and effectiveness of lessons taught by them. Practically, the data that is collected and examined is a combination of observation of classroom activities and outcome of students' written work. This phase involves the following operations:
  - **Defining the exact dimensions of teachings:** The teacher compares the expected and the actual behaviour changes in course of his teaching, at the end of his session. The extent or quality of accomplishment of stipulated objectives helps the teacher to understand the effectiveness of teaching. It also helps in taking decisions about future improvement. Methods and strategies used by teacher are said to be effective only if the teaching objectives have been achieved.
  - **Selecting appropriate testing devices and techniques:** The teacher chooses appropriate testing techniques and evaluation tools to measure the various dimensions of behaviour. Thus, he notices the changes brought about by his teaching. The tests may be of many types, e.g., paper-pencil test, standardized tests, objective type tests, teacher-made tests, etc. It helps the teacher

to teach things better in future and also the students to learn things better.

- **Changing strategies in terms of evidences gathered:** On the basis of assessment, a teacher comes to know about his performance. If the objectives have not been achieved, the teacher may find out the factors responsible for failure and also find the remedial techniques to be applied so that the objectives can be achieved.



CHECK YOUR PROGRESS

Q 6: What is teaching?

.....

Q 7: Write three characteristics of teaching.

.....

Q 8: Write the phases of teaching.

.....

Q 9: Name the activities involved in the interactive process of teaching.

.....

6.11 MEANING OF TEACHING MACHINES

Teaching machines are regarded as one of the most sophisticated and developed teaching-learning aids among the category designated as hardwares. In many of the teaching-learning situations, it has the wonderful capacity of replacing the teacher in all types of teaching tasks. The credit for the invention for this hardware goes to Sydney L. Pressy. In 1927, he invented a teaching device for the purpose of self-learning much similar to many of the electronic equipments available today in the markets in which one has to respond to the multiple questions by selecting an alternative. The green light appears on the board when he provides right answer i.e. the capital of Haryana is Chandigarh and not otherwise.

These electronic equipments represent the simplest form of a teaching machine. However, there has been a tremendous progress in the quality and working of the teaching machines especially after the invention of computer technology. Today it is beyond our imagination, the services that can be rendered by the modern sophisticated teaching machines available in the schools of the progressive countries.

6.11.1 Characterstics of Teaching Machine

The characteristics of teaching machine are as follows:

- A teaching machine not only presents information to the students but also elicit information from them.
- It keeps record of student's response. This estimates how much they have learnt.
- Teaching machine informs the people about their progress by showing correct and incorrect responses. This restricts cheating.
- Teaching machine helps in solving the problem of teaching.
- Teaching machine controls the behaviour of students.

6.11.2 Educational Advantages of Teaching Machine

The educational advantages drawn with the help of teaching machines can be summarised as below:

- Teaching machines may work for meeting out the increasing demand of more teachers in view of the growing number of students and schools. Moreover, t can work towards providing appropriate teachers for the particular subjects where there is a death of such subject teachers.
- Teaching machines may help the teachers by sharing their responsibilities regarding teaching and instructional work and thus leave them free for other type of activities helpful in the personality development of the children.

- Teaching machines may play an effective role for providing guidance and counselling to the students especially in the individualised way.
- They can provide best-individualised instructions and auto-learning to each and every learner irrespective of their varying needs and abilities.
- On account of their mechanistic and never tiring nature they can work day and night for providing instructions for a number of learners without any sight of mental or physical fatigue. They can answer a number of questions and queries without showing any angry or reaction of any kind. They can be used at the will of the learner and every learner has full opportunity to learn from them according to his taste, ability and pace.
- They can surpass a good tutor in their capacity of providing feedback, reinforcement, exercise and practice work for the individual learner. The work of continuous evaluation become quite feasible with the help of teaching machines and in this way they can provide a better substitute in them for an effective tutor and experienced teacher.

6.11.3 Demerits or Limitations of Teaching Machine

Teaching machines are often criticised on account of their following demerits and limitations.

- Teaching machines prove quite costly in terms of their purchase and maintenance.
- It is very difficult to get the proper technicians for carrying out any repair work of these machines. In the absence of such persons, the machines may remain out of use causing serious harm to instructional work.
- There is every possibility of causality to the young learner while handling these machines for self-learning.
- The learner may go astray on the path of self-learning and waste

their energy in the useless activities. There is also a danger of making the students careless about their progress and pace as they may think that they may learn anytime they wish as the machine is there to help them.

- The teacher are haunted with fear of being replaced with the machines.
- The teaching machines are bound to make the teaching-learning environment quite mechanical, right, dull, lifeless and boring on account of their mechanical nature and heartless working. There is no possibility of warmth, physical contact and union of the minds as otherwise available in the usual teaching-learning situation with the presence of human teacher.

The close analysis of the above cited merits and demerits of the teaching machines may reveal that they have a quite big roles for proving them a good friend of teachers and as well as learners. The defects and limitations pointed out not so serious. Actually, these arise on account of their mishandling and misconceptions. There is no need to take them as an end or substitute of the teachers. They are to be treated just as an aid to the teaching-learning process and every teacher should try to learn their proper use and maintenance for helping them in exercising their various responsibilities as a teacher.



CHECK YOUR PROGRESS

Q 10: Who invented the teaching machines?

.....

Q 11: What are teaching machines?

.....

Q 12: Write three characteristics of teaching machines.

.....

Q 13: Write three advantages of teaching machines.

.....

Q 14: Write three disadvantages of teaching machines

.....



ACTIVITY 6.1

1. Make a list of different types of communication that take place in the teaching- learning process.
2. Go to some government aided school and private aided schools and make a comparison of the phases of teaching by asking the students as well as the teachers.



6.12 LET US SUM UP

- Communication plays an effective and essential role for running the show of any Formal or informal teaching-learning process. In many of its way, teaching is communicating and in this sense, good teachers are always good communicators. It is also equally true for the learners
- Effective communicators are those who are able to select the most appropriate symbols or messages for specific person and who are able to interpret the intended message symbols of other speakers.
- The presence of five main components or elements in general in any process of communication namely: - (i). The source of communication or sender of the message, (ii). Contents of communication or message, (iii). Media or channel of communication, (iv). The Receiver of the communication and (v). Response material or Feedback.
- A teacher has to perform various functions before, during and after the class. These functions are known as 'phases of teaching'. Thus, teaching is divided into three main phases, i.e., (i) pre-active, (ii). interactive and (iii) post-active phases of teaching.
- Teaching machines are regarded as one of the most sophisticated and developed teaching-learning aids among the category

designated as hardwares. In many of the teaching-learning situations, it has the wonderful capacity of replacing the teacher in all types of teaching tasks.

- Teaching machines not only help students but also save energy and time of the teacher.



6.13 FURTHER READING

1) Dr. Mangal, S.K. 2001.Foundations of Educational Technology. Ludhiana: tendon Publications.
2) Aggarwal, J.C. 2009. Essentials of Educational Technology. New Delhi: Vikas Publishing House.
3) Sampath, K.A. Panneerselvam, S. Santhanam. 2007. Introduction to Educational Technology. New Delhi: Sterling Publishers.
4) Sharma, K.K. 2007. Educational Technology. Delhi: Mahavir and Sons Publishers and Distributors.



6.14 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: Communis

Ans to Q No 2: According to Newman and Summer, "Communication is an exchange of facts, ideas, opinions or emotions between two or more persons."

Ans to Q No 3: Five common principles of communication are: (i). Principle of mastery on language, (ii). Principle of motivation, (iii). Principle of active listening, (iv). Principle of multiple channel and (v) Principle of feedback.

Ans to Q No 4: Two

Ans to Q No 5: Verbal communication make use of oral or written form of language, whereas, non-verbal communication makes use of body-language, facial expression, etc.

Ans to Q No 6: Teaching is considered as a social phenomenon. Teaching is an art in which a teacher influences his students and motivates them for learning. Students learn and develop according to the ideals set before

them by teachers. Teaching is nothing but an organized set of activities, as a result of which pre-determined objectives are achieved.

Ans to Q No 7: Three characteristics of teaching are as follows:

- Teaching is an interactive process between a teacher and a learner. It is not a one-sided affair as both the learner and the teacher have to be fully active during this process.
- Teaching is not an independent activity as it cannot happen in vacuum. It takes place in some social set-up where the teacher aims at modifying the behaviour of an individual or group.
- Teaching is both formal and informal. Both the ways, it help in achieving desired goals.

Ans to Q No 8: The phases of teaching are: (i). Pre-active Phase, (ii). Inter-active Phase, and (iii). Post-active Phase.

Ans to Q No 9: The interactive phase involves following activities:

(i). Perception, (ii). Diagnosis of the learners, (iii). Reaction or achievement.

Ans to Q No 10: Sydney L. Pressy invented teaching machines.

Ans to Q No 11: 'A teaching machine' is a mechanical, electrical or automatic device designed to teach students by presenting information in a planned sequence, with questions based on the given information and providing immediate response to his answer.

Ans to Q No 12: Three characteristics of teaching machines are as follows:

- A teaching machine not only presents information to the students but also elicit information from them.
- It keeps record of student's response. This estimates how much they have learnt.
- Teaching machine informs the people about their progress by showing correct and incorrect responses. This restricts cheating.

Ans to Q No 13: Three advantages of teaching machines are:

- Teaching machines may work for meeting out the increasing demand of more teachers in view of the growing number of students and schools. Moreover, t can work towards providing appropriate teachers for the particular subjects where there is a death of such subject teachers.

- Teaching machines may help the teachers by sharing their responsibilities regarding teaching and instructional work and thus leave them free for other type of activities helpful in the personality development of the children.
- Teaching machines may play an effective role for providing guidance and counselling to the students especially in the individualised way.

Ans to Q No 14: Three disadvantages of teaching machines are:

- Teaching machines prove quite costly in terms of their purchase and maintenance.
- It is very difficult to get the proper technicians for carrying out any repair work of these machines. In the absence of such persons, the machines may remain out of use causing serious harm to instructional work.
- There is every possibility of causality to the young learner while handling these machines for self-learning.



6.15 MODEL QUESTIONS

A. Short Questions (Answer each question in around 150 words)

Q 1: What is meant by communication?

Q 2: What are the basic characterstics of communication process?

Q 3: Mention some principles of communication.

Q 4: What is meant by internal and external barriers of communication process?

Q 5: What do you mean by verbal and non-verbal communication?

Q 6: Write a short note on upward and downward communication?

Q 7: What is teaching machine?

Q 8: What are the educational advantage of teaching machine?

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: Elaborate the process of communication.

Q 2: Describe the different types of communication with examples.

Q 3: Discuss about the phases of teaching.

Q 4: Define teaching machines. Write the characteristics of teaching machines.

*** ***** ***

UNIT 7: MASS MEDIA APPROACH IN EDUCATIONAL TECHNOLOGY

UNIT STRUCTURE

7.1 Learning Objectives

7.2 Introduction

7.3 Meaning and Significance of Mass Media Approach

- 7.3.1 Importance of Mass Media
- 7.3.2 Principles of Using Mass Media

7.4 Broadcasting

7.5 Let Us Sum Up

7.6 Further Reading

7.7 Answer to Check Your Progress

7.8 Model Questions

7.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- Define the concept of mass media;
- Explain the significance of mass media on education;
- Define the meaning of broadcasting;
- Describe the concept of Educational Television;
- Identify the chief merits of Educational Television; and
- Discuss different kinds of Television Programme.

7.2 INTRODUCTION

Presently we are facing mainly two general circumstances - "information explosions" as well as the "population explosion" at a time. Information explosion refers to an explosion of knowledge. As we know that, throughout the world, social and technological changes are taking place very rapidly due to expanding the world of information now a days. New frontiers of knowledge and the horizon of human knowledge and understanding is expanding very fast.

On the other hand, with the explosion of knowledge, there is also population explosion. Year by year the student population is immensely increasing due to the growth of population and democratization of education with varying levels of motivation and aspiration. Generally, the problem of "population explosion" is more serious particularly in the developing countries than the developed one. For example, India is facing serious difficulties both from population as well as information.

The practical fact is that "more things to be learnt and more people to be taught." Today there is a cry for "more education to more people in less time". For giving solutions to such problems, educational technology consisting of various media of mass communication are essentially required. With the help of this mass media under educational technology, both qualitative improvement and quantitative expansion of education can be facilitated and accelerated. Therefore, the mass-media has come to our rescue to tackle this problem. With the help of this unit, you will be able to understand the importance of mass media in the field of education right now. Along with this, the concept and merits of TV programme and SITE are discussed here for your better understanding.

7.3 MEANING AND SIGNIFICANCE OF MASS MEDIA APPROACHES IN EDUCATION

"Educational institutions, left to themselves, may not be successful in achieving the educational objectives of developing societies without the support of the new media." - **Nelson Henry.**

Education is a subject that takes into consideration of the total human aspects of growth and development. The reality is that success of education cannot be achieved merely by substituting mechanical methods for human beings, but by developing new patterns using both human beings, non-human resources and most importantly technological advancements in order to teach more people better and more rapidly.

There are variety of media for mass communication such as Radio, Television, Newspapers and Films etc. The media of communication is the

medium by which a piece of information or knowledge is communicated to us. This medium is the message, which is of greater importance. Because, the same piece of information when conveyed on a printed page or over the telephone by radio, or television will appear different and have entirely a different effect on us. Hence the effectiveness of a piece of information depends upon the medium through which it is imparted.

Hence, the mass media is very important for class room teaching as a part of the process of instruction. The sole objective is to improve the teaching- learning process with the use of various media. Therefore, the main purpose of mass-media in education is to benefit more students with fewer teachers or to obtain quality education.

Carlton W H Erickson observed, "In recent years technology has swept through society, from research laboratories into manufacturing communications, the space age and finally now, into education."

In the previous days, in the field of education, teachers were the only medium of communications for learners. Verbal deliberation was the responsibility on the part of the teachers and passive hearing on the part of the students. With the passage of time, the invention of the printing press lead to cheap, mass produced books, thus bringing literacy and knowledge within easy reach of the masses. Before the books were hand written and hence very rare and expensive. Gradually the explosion of printing technology soon led to newspapers which in turn, opened the gate of information as well as knowledge dissemination, besides being a new, powerful avenue for advertising. For quite some time now, different products of mass media like Radio, TV and Video have spread their influences into every domain of public consciousness and that is the main reason why they are being started to use in the field of education. In fact, the mass media have become a well of message around the world of today and have entered into all the structures of daily life.

The National Policy on Education 1986 and modified Policy, 1992 observed, "The media has profound influence on the minds of children. The mass media make the constraints of time and distance manageable. Modern educational technology must reach out to the most distant areas

and the most deprived section of beneficiaries simultaneously with the areas of comparative affluence and ready availability."

7.3.1 Importance of Mass Media

Many important functions are served by mass media at present. They are very helpful in teaching large number of people and particularly useful in the field of compulsory education and adult literacy also. Of late, they are being increasingly used in the field of distance education. Say for example, Radio forums as a means of adult and continuing education have proved to be extremely successful in Canada, Nigeria, Sweden, Tanzania, and many other countries including India. In this regard some of the points are stated below.

- Mass Media provides information to the masses of the society within a less time.
- It takes a wide coverage of information regarding anything that is happening in any comer of the world.
- It brings the entire world to the individual or to the classroom. Children spend hour's together sitting in front of the television and can visualize, hear and acquire knowledge about the world.
- These media easily reach groups, allow repeated use, give more reality, influence attitudes, show cause and effect relationships and ultimately motivate the audience.
- It sends information to remote places and helps in distant learning.
- It helps in modification of attitudes, inculcation of desirable values and acquaintance with cultural heritage.
- Mass media acts as an agency of social change.
- Mass media are useful for reinforcing group dynamics and interpersonal communication.
- Mass media as means of communication make ideas clear to children and help them to acquire correct knowledge. They help in simplifying and in giving vividness to explanation.

- Mass Media make the instruction concrete and stimulate interest and excite curiosity in things.

"Education today, therefore, has a far greater responsibility than it had ever before. It has to meet the demands of a dynamic world which change its character every day. Contemporary education has to be more comprehensive and complete than it was ever before. The role of the various agencies of education like home, society, community etc. has consequently increased, so has the role of the mass media like television, radio, cinema, newspaper increased." So now-a-day, press, radio, cinema, television, etc. are becoming more and more important in an individual's life.

Mass media in education are press, radio, motion-picture, television, etc. So mass media are many and these are technically called passive agencies of education. They influence the attitude and behavior of the people indirectly. These agencies cover entertainment, informatory propaganda, historical record, education and improvement of moral judgement and moral tone of the people.

7.3.2 Principles of Using Mass Media

For using the mass media very effectively the teacher should make all necessary arrangements. He has the responsibility to select the mass media according to the age level of the students. Even he must know some general principles of using the mass media. Those principles are -

- **Organization:** Mass media should be organized as integral part of the educational programmes. They should not be separated from other curricular activities.
- **Selection:** Mass media should be properly selected and coordinated by the teacher. An experienced and trained teacher can select the mass media according to the needs of the students.
- **Planning:** Mass media should be available according to the need

of the instructional programme. The teachers should possess skill in the use of mass media. They should have special training in their preparation. So they should be properly planned.

- **Experience:** Mass media should be related to pupil's experience.
- **Preparation:** There should be adequate preparation on the part of pupils. The teacher should prepare himself before using it. He should know what the mass media teach and where they fit into his plan of teaching. Adequate preparation should be followed by proper presentation and an adequate follow-up.
- **Evaluation:** Mass media should be evaluated at regular intervals in regards to their use, effect on learning and their functions.



CHECK YOUR PROGRESS

Q 1: Give the definition of Nelson Henry regarding new media.

.....

Q 2: Mention any three types of mass media.

.....

Q 3: Write any two importance of mass media.

.....

Q 4: Mention any three principles of using mass media.

.....

7.4 BROADCASTING

According to the definitions from Oxford Languages, broadcasting refers to the transmission of programmes or information by radio or television. Ever since the start of school broadcasting by the British Broadcasting Corporation (BBC) in 1920, it has made rapid strides in making sound contribution to formal education. The Bombay Radio Station put out

items of special interest to school children occasionally from January 1929. From April 30, the Corporation of Madras had regular school broadcasts for half an hour all weekdays. Similar programmes were introduced by the Calcutta transmitter in 1932.

The programmes for schools produced by Akashvani (AIR) radio stations have been and still are for the following classes of school children/ teachers:

- Children of primary classes;
- Children of secondary and higher secondary classes;
- Preparing lessons for secondary and higher secondary classes near examination time;
- Teachers;
- General enrichment programme for children.

These broadcasts can either be 'live' or pre-recording. Broadcasting organization throughout the world, including AIR, include in their output various school broadcasts. Such programmes are normally arranged in consultation with the heads of various institutions. This connection between the radio educational authorities helps in bringing out effective and useful programmes for the students. Regarding educational broadcasting following discussion can be mentioned here

- **Radio:** Radio is used mainly to broadcast events to far and wide places of the world. It is also one of the important source of entertainment. Every day, we listen various talks, discussions and debates from radio. Such events are extremely important and useful for the students. Especially for the purpose of teaching, many programmes are broadcast over the radio. So radio acts as a great recreational and education force. It broadcasts scientific and cultural facts. It enlightens public opinion. It stimulates curiosity and interests. Through school broadcasts, expert leaching in such diverse fields of science, social studies, art, music, languages, politics, current affairs and other areas, can provide information and enrichment for pupils and for the teacher also.

Radio is, at present, not only one of the popular mass media, but also a potential instructional tool in the formal, informal and non-formal education. It is now giving more emphasis on the planning and production of science programmes in both the formal and no-formal spheres of educational broadcasts.

There are also special programmes for teachers and teacher-education in most of the stations. These are intended to familiarize methods of teaching. These service has been more necessitated in recent years on account of large changes in school curriculum and methodology particularly in subjects like science, mathematics, social studies and English.

Secondary School Broadcasts aim at helping students and teachers by giving up-to-date content knowledge, providing new approaches and methods of teaching. A few non-syllabus programmes are however, broadcast in order to break away from the stereotyped formal education, for doing away with monotony in the curricular topics and also to stimulate awareness and curiosity about the modem world dealing with them ranging from popular science to current affairs.

Besides secondary schools broadcasts, primary school programmes have recently assumed greater importance. This has been done in order to reduce wastage and stagnation at the primary school stage by making the school situation more attractive and interesting.

The radio with its vast resources can organize a series of programmes in order to bring universalization of primary education and promote adult literacy. The programmes are being related to their education, health, hygiene, nutrition etc. with a thrust on bringing the audience into the mainstream of national life.

So, radio is an effective medium. It has occupied a significant place in communication. It is also playing an important role in education. It not only informs, but also inspires. It not only inculcates values and virtues, but also creates attitudes, interests and appreciation.

- **Television:** TV has become a child's third parent and first teacher.

Today, it can be said an extremely popular source of entertainment

among youngsters. The history of television shows that it is a very powerful, informative, socializing and mobilizing force. We listen and see the instruction of the speaker from the television. So the whole personality of the child is engaged in the task. Hence, it has become the most important and powerful agency of mass communication. In television, news items are not only read out but the events are shown. As a result of which not only problems are discussed but practical remedies and solutions are also suggested.

So, educational television is the most recent audio-visual media for class instruction. There are programmes on the television especially for the school children. These programmes are aimed at educating the school children and they instill good moral values. Television can give a very good idea of the history of the country through dances, short-films on historical places, museums etc. Thus television plays a vital role as a means of mass media in educating the masses.

Advantages of Educational Television

The advantages of educational television are many. The young people watching the television can get a very good idea of how it really happened. For example the nuclear explosions of the launching of rockets are programmes of extreme educational value.

- Educational television is capable of making available many needed and so far inaccessible learning experiences.
- Educational television brings about continuing co-operative planning by teachers, supervisors, learning materials exports and skillful production teams.
- Good and effective educational television broadcasts result from the outgrowth of curriculum planning, of content analysis and of the selection of this most appropriate instructional media
- It can use a variety of audio-visual aids, motion pictures, film-strips, slides, recordings, drawings, maps and other projected and non-projected aids can be demonstrated through Television. Video-tapes and recordings on television bring us the launching of space rockets, of political and social events.

- Educational television brings us a new kind of teaching team into existence.
- It can acquaint the children with past culture, history and social life.
- It can motivate both children and adults, because not only it is educative but also entertaining.
- The televised-lectures are more thrilling as they bring to the listeners not only verbal information and the instruction of the speaker but also the whole of his personality engaged in the task.
- National problems like those of population and poverty and illiteracy are often highlighted and discussed over the television.
- It plays an important role to play in educating the children on the history and culture of our country. It gives a very good idea of the history of the country by telecasting various programmes through dances, short films on historical places, museums etc.

Thus television plays a very vital part, as a means of mass media in educating the masses. It is a dynamic and powerful medium which influence education. Its effective use is based upon the fundamental psychological principles of learning which apply to all successful processes of learning.

Development of Educational Television Experiment in Indi

The development of educational television in India can be traced back to the General Conference of UNESCO held in New-Delhi in 1956. Thus the experimental television service was started with the objectives of "experimentation, training and evaluation" as a part of the UNESCO Project. During 1960-61 a series of social education programmes were telecast in collaboration with UNESCO.

The nature as well as impact of these programmes was evaluated by the National Fundamental Education Centre and Indian Adult Education Association, New-Delhi. Regular TV. Service was inaugurated in Delhi on the 15th August, 1965. It was a landmark in the history of television with launching of the "Krishi Darshan" programme for farmers.

One grand project on television was undertaken and accordingly some T.V Sets were installed in secondary schools by 1985. After

execution of this project, this was also evaluated. The experiments of all these projects were significantly beneficial, enlightening and interesting.

Day-by-day the use of educational television increased at a rapid rate and tremendous progress has been made in use of educational television in India after 1982. As the number of schools equipped with T.V. sets increase, benefit of E.T.V. programmes were extended to number of students in different subjects like Physics, Chemistry, Hindi, English, Geography and current affairs.

SITE (Satellite Instructional Television Experiment)

The famous Satellite Instructional Television Experiment (SITE) was implemented during 1975-76. This was inaugurated by Smt. Indira Gandhi, the then Prime Minister of India at Ahmedabad on the 1st August, 1975. Under the experiment, it was possible to telecast programmes to 2400 villages in six states - Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Odisha and Rajasthan.

The major objectives of the site programmes was to help people in their development endeavors. As children's morning programme formed an important component of the SITE, educational advancement was emphasized more than anything else. The one year long Satellite instructional television experiment (SITE) which commenced on 1st August 1975 and concluded on 31st July 1976, marked the beginning of a series of innovative and constructive educational television programmes for national development and for educating the Indian masses living in remote rural areas.

The SITE educational programmes were also aimed at making the children sensitive to, and learn, community living and improve their basic concepts and skills in the areas of numeracy, language and Science.

The programmes were directed at creating a positive attitude to formal education and making education interesting, creative, purposive and stimulating. The educational programmes were so designed as to familiarize children with facts and matters normally beyond their observation and experience.

The Satellite for this experiment, ATS-6 was provided by the National Aeronautics and Space Administration (NASA) of USA and the ground segment was prepared by the Indian Space Research Organization (ISRO) working in collaboration with All India Radio/ Doordarshan.

The educational and developmental programmes were beamed up to the satellite from earth stations set up in Ahmedabad and Delhi and were broadcast towards India using the high power transmitter and the large antenna aboard ATS-6. These programmes were received in about 2400 villages in six different states of India.

One of the purposes of the experiment was to provide a system test of direct broadcast technology in relation to a large developing country.

It also aimed at demonstrating that a developing country like India could fabricate, manufacture and maintain the required earth stations, rebroadcast transmitters and community receiving sets in far off villages with adequate efficiency and reliability.

The experiment was also considered as a learning experience to design, produce and telecast relevant educational and developmental programmes to widely spread areas with different problems and languages using, on a time sharing mode, a single broadcast channel.

One and a half hours of broadcast in the morning was denoted to school children while 2.5 hours in the evening were meant for general audiences in the villages. The evening programmes included half an hour of common programmes in Hindi which originated in Delhi.

The evaluation of the experiment provided a great deal of information and insight into how things worked and what can be done in the areas of technology, management, programme making and programme support to turn this new broadcasting innovation into a powerful aid to education and development for hitherto neglected rural arears.

After the success of SITE in 1975-76, India decided to have a multi-purpose national satellite for her own. The Indian National Satellite System (INSAT-1) represents India's step in this direction. It is intended for telecommunication, weather forecasting and other meteorological

observations, data transmission, direct TV broadcasts to direct receiving sets in rural communities, networking of terrestrial TV transmitters and regional and national networking of radio transmitters.

According to the recent plan of the Department of education, Ministry of human Resource Development, Government of India, and the major educational objectives of INSAT television Programme is to promote alternative approaches to education for children, youth and adults. There are specific programmes to emphasize direct teaching that aim to reduce the workload in classroom and improve the quality of programmes through training of manpower.



CHECK YOUR PROGRESS

Q 5: What is meant by the term broadcasting?

.....

Q 6: Write one advantages of Educational television

.....



7.5 LET US SUM UP

- Mass media have proved to help in classifying concepts, stimulating group and individual activities, developing a collective critical awareness, changing attitudes, imposing a new structure or organization on certain subjects and encouraging originality and creativeness.
- With the help of this mass media under educational technology, both qualitative improvement and quantitative expansion of education can be facilitated and accelerated.
- There are variety of media for mass communication such as Radio, Television, Newspapers and Films etc. The media of communication is the medium by which a piece of information or knowledge is communicated to us.

- The mass media is very important for class room teaching as a part of the process of instruction. The sole objective is to improve the teaching- learning process with the use of various media.
- Teachers have to be properly motivated and made interested in the use of such materials. And they have also to be trained and oriented in the adequate use and maintenance of the materials.
- The National Policy on Education 1986 and modified Policy, 1992 observed, "The media has profound influence on the minds of children. The mass media make the constraints of time and distance manageable. Modern educational technology must reach out to the most distant areas and the most deprived section of beneficiaries simultaneously with the areas of comparative affluence and ready availability."
- Mass media in education are press, radio, motion-picture, television, etc. So mass media are many and these are technically called passive agencies of education. They influence the attitude and behavior of the people indirectly. These agencies cover entertainment, informatory propaganda, historical record, education and improvement of moral judgement and moral tone of the people.
- According to the definitions from Oxford Languages, broadcasting refers to the transmission of programmes or information by radio or television. Ever since the start of school broadcasting by the British Broadcasting Corporation (BBC) in 1920, it has made rapid strides in making sound contribution to formal education.
- Radio is used mainly to broadcast events to far and wide places of the world. It is also one of the important source of entertainment. Every day, we listen various talks, discussions and debates from radio. Such events are extremely important and useful for the students.
- The radio with its vast resources can organize a series of programmes in order to bring universalization of primary education and promote adult literacy. The programmes are being related to their education, health, hygiene, nutrition etc. with a thrust on bringing the audience into the mainstream of national life.

- Educational television is the most recent audio-visual media for class instruction. There are programmes on the television especially for the school children. These programmes are aimed at educating the school children and they instill good moral values.
- Educational television brings about continuing co-operative planning by teachers, supervisors, learning materials exports and skillful production teams.
- Good and effective educational television broadcasts result from the outgrowth of curriculum planning, of content analysis and of the selection of this most appropriate instructional media
- The development of educational television in India can be traced back to the General Conference of UNESCO held in New-Delhi in 1956. Thus the experimental television service was started with the objectives of "experimentation, training and evaluation" as a part of the UNESCO Project.
- Day-by-day the use of educational television increased at a rapid rate and tremendous progress has been made in use of educational television in India after 1982. As the number of schools equipped with T.V. sets increase, benefit of E.T.V. programmes were extended to number of students in different subjects like Physics, Chemistry, Hindi, English, Geography and current affairs.
- The famous Satellite Instructional Television Experiment (SITE) was implemented during 1975-76. This was inaugurated by Smt. Indira Gandhi, the then Prime Minister of India at Ahmedabad on the 1st August, 1975. Under the experiment, it was possible to telecast programmes to 2400 villages in six states - Andhra Pradesh, Bihar, Karnataka, Madhya Pradesh, Odisha and Rajasthan.



7.6 FURTHER READING

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2) Mangal, S.K. and Mangal, U. (2010). Essentials of Educational Technology. New Delhi: PHI Learning Pvt. Ltd.
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7.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: "Educational institutions, left to themselves, may not be successful in achieving the educational objectives of developing societies without the support of the new media." - Nelson Henry.

Ans to Q No 2: Radio, Television, Newspapers.

Ans to Q No 3: Many important functions are served by mass media at present. They are very helpful in teaching large number of people and particularly useful in the field of compulsory education and adult literacy also. Of late, they are being increasingly used in the field of distance education. Say for example, Radio forums as a means of adult and continuing education have proved to be extremely successful in Canada, Nigeria, Sweden, Tanzania, and many other countries including India. Three importance are given below-

- Mass Media provides information to the masses of the society within a less time.
- It takes a wide coverage of information regarding anything that is happening in any comer of the world.
- It brings the entire world to the individual or to the classroom. Children spend hour's together sitting in front of the television and can visualize, hear and acquire knowledge about the world.

Ans to Q No 4: For using the mass media very effectively the teacher should make all necessary arrangements. He has the responsibility to select the mass media according to the age level of the students. Even

he must know some general principles of using the mass media. Those principles are -

- **Organization:** Mass media should be organized as integral part of the educational programmes. They should not be separated from other curricular activities.
- **Selection:** Mass media should be properly selected and coordinated by the teacher. An experienced and trained teacher can select the mass media according to the needs of the students.
- **Planning:** Mass media should be available according to the need of the instructional programme. The teachers should possess skill in the use of mass media. They should have special training in their preparation. So they should be properly planned.

Ans to Q No 5: According to the definitions from Oxford Languages, broadcasting refers to the transmission of programmes or information by radio or television. Ever since the start of school broadcasting by the British Broadcasting Corporation (BBC) in 1920, it has made rapid strides in making sound contribution to formal education. The Bombay Radio Station put out items of special interest to school children occasionally from January 1929. From April 30, the Corporation of Madras had regular school broadcasts for half an hour all weekdays. Similar programmes were introduced by the Calcutta transmitter in 1932.

Ans to Q No 6: The advantages of educational television are many. The young people watching the television can get a very good idea of how it really happened. For example the nuclear explosions of the launching of rockets are programmes of extreme educational value. One advantage of Educational Television is---

- Educational television is capable of making available many needed and so far inaccessible learning experiences.

7.8 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words)

Q 1: Mention the observations of National Policy on Education, 1986 regarding Mass Media.

Q 2: What are the different principles of using Mass Media?

Q 3: Write the full form of AIR.

Q 4: When did a series of Educational Programmes telecast in collaboration with UNESCO?

Q 5: What were the aims of SITE educational programmes?

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: Discuss the significance of Mass Media in the present world.

Q 2: Explain the advantages of Educational Television.

Q 3: Write a note on radio as a broadcasting media.

Q 4: Why did mass media come into the field of education? Discuss.

Q 5: Discuss about SITE.

*** ***** ***

UNIT 8: EMERGING TRENDS IN EDUCATIONAL TECHNOLOGY

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 EDUSAT as an Emerging Trend in Educational Technology

- 8.3.1 Features and Function of EDUSAT
- 8.3.2 Advantages and Disadvantages of EDUSAT

8.4 Teleconferencing System in Education

- 8.4.1 Basic Types of Tele conferencing
- 8.4.2 Uses of Teleconferencing
- 8.4.3 Advantages and Disadvantages of Teleconferencing

8.5 Computer assisted instruction (C.A.I.)

- 8.5.1 Use of C.A.I

8.6 Let Us Sum Up

8.7 Further Reading

8.8 Answer to Check Your Progress

8.9 Model Questions

8.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- Understand the concept and functions of EDUSAT;
- Comprehend the system of Tele conferencing in the field of education;
- Know the idea of C.A. I and its different uses in Education.

8.2 INTRODUCTION

From the discussion of the earlier unit, it has been clear to you all that combining the two words "Education" and "Technology", educational Technology means the study of the techniques or skills of teaching learning activity that used to take place between the two agencies of the teachers

and the taught. It stands for a wise application of human and non-human resources providing appropriate solution to the educational problems. It thereby improves the principles and procedures of education to give a scientific fitting. By observation the nature, it can be said that educational technology is a system of 5 Ms, which involves man, machines, materials, methods and media. All of them are inter related and harmonized into one to work together for realization of the educational objectives of the modern man. Thus in the field education, many new and innovative technologies are being used which involves machines as well as some medias. From the practical observation it can be mentioned here that the last few years have witnessed a dramatic change in the teaching learning model. Now, the way of teaching students are different from the teaching methods that were adopted a few decades back. In this unit, we are going to discuss some of those changes or new trends that are used and applied in education with the application of technologies.

8.3 EDUSAT AS AN EMERGING TREND IN EDUCATIONAL TECHNOLOGY

With the change in time and situation and with the emergence of new technologies, its use and presence are growing in the educational scenario especially in the classroom. From the practical situation, it has been seen that, the new generation readily accepts the utilization of new technologies and also finds it interesting to do so. These technologies play an important role in children's learning and developing their cognitive abilities. The application of educational technology enhances skills and cognitive characteristics. Along with this, with the help of new technology explosion of learning is made and children are able to receive new information, especially through use of different devices and aids as well as satellites. As a result, utilization of educational technology is growing very fast. With the emergence of child centric idea of education throughout the world, both hardware and software technology have become integrated part of teaching learning process for realizing the ultimate aim of education. Many new trends

have been added to the field of education with a view to disseminate knowledge to each children of a country. One such important and remarkable trend is EDUSAT. Let's discuss about this in detail-

- **EDUSAT:** With the enforcement of Right to Education Act (2009) in India it has become necessary to provide education to all children between age group of 6-14 years. However for a country like India, it is very difficult to reach each and every child where maximum number of children are surrounded in remote areas separated by vast geographical distances. Even many time, some of the regions are not accessible. Though there has been substantial growth in the number of educational institutions at all the level, but this is not sufficient to provide proper infrastructure in rural areas. Scarcity of teachers is also an important reasons which adversely affect the efforts of Indian Government to provide quality education to children.

  To overcome this problem, satellites have been launched to establish connectivity between educational institutions in urban regions and rural areas. Along with supporting to formal education, a satellite system can also help in facilitating dissemination of information and knowledge to rural and remote population. With this objective in view, ISRO has dedicated one of its satellites solely for the education sector of the nation. This satellite is called the EDUSAT. It is also named as GSAT-3 satellite. This EDUSAT was launched on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01). After a 17 minutes flight launching, the satellite weighing 1950 kg was successfully placed in a geo-transfer orbit at a height of 180 km above the earth. It is manipulated by the satellite centre of the ISRO at Bangalore. The projected life of the EDUSAT is 7 to 10 years and it can cover whole geographical India. EDUSAT is mainly intended to meet the demand for an interactive, satellite based distance education system for the country. EDUSAT is India's first thematic satellite which was dedicated exclusively to educational services. It is heartening to mention here that, EDUSAT is a collaborative project of the Union Ministry of Human Resource

Development, ISRO, Indira Gandhi National Open University and State Departments of Education. The primary objective of this project is to provide strength to the interactive satellite based distance education system of India. This is a project of Indian Government that strongly reflects the country's commitment to use space technology for national development, especially for development of the population residing in remote and rural geographical locations.

EDUSAT can cover the whole geographical India with its five spot beams covering the northern, north eastern, southern and western region of the country. It is important to note here that in North Eastern Regional (NER) State, the programme has been implemented in 5 states that are Tripura, Mizoram, Nagaland, Meghalaya and Arunachal Pradesh. Each of these States have been given 50 Satellite Interactive Terminals (SITs) free of cost besides the Studio and up linking equipment, and that are currently at different stages of installation. Teachers are the key figure in educational endeavor and as such as per Ministry of Human Resource Development (MHRD) directives, the emphasis has been given to Teachers' Training, Secondary and Higher Secondary schools for connecting to the network.

In the context of North-eastern region, it is very much essential to note that during 2009-10, the Arunachal Pradesh EDUSAT network has been commissioned with one HUB cum satellite studio at Rajiv Gandhi University, Rono Hills, Itanagar and 50 Satellite Interactive Terminals (SITs) at various educational institutions all over the state. This network was inaugurated by Honorable Governor of Arunachal Pradesh on 05th September, 2009. All the equipment for HUB and 33 Satellite Interactive Terminals (SITs) under Assam EDUSAT network has been received at respective sites. Installation & Commissioning is in progress. Expansion of EDUSAT network in Meghalaya with 9 (nine) more SITs in the block offices of three districts has been initiated in association with State Institute of Rural Development, Meghalaya.

Primarily, the EDUSAT was configured to meet India's growing demand for distance education using audio-visual medium and

employing Direct-to-home type direct satellite broadcasting with interactive Class-room capabilities. The EDUSAT Utilization Program was implemented in a manner as to create state-wise SATCOM (Airborne radio telephone communication via a satellite) networks for the eight North Eastern states disseminating quality education Programmes for different levels of the education. There are number of educational radio and television programmes in India, produced by different institutions like, Central Institute of Educational Technology (CIET), State Institute of Educational Technology (SIET), Audio Visual Research Centres (AVRCs), Educational Media Research Centres (EMRCs), Indira Gandhi National Open University (IGNOU), National Institute of Open Schooling (NIOS), and Indian Institute of Technology (IITs). These programmes are broadcasted on their scheduled times daily all over the country through All India Radio (AIR), FM Radio, National Television Channel, Gyandarshan, and many more, which provide quality education to students of schools, colleges and higher education institutions. These all are possible with the help of EDUSAT.

- **Objectives of EDUSAT:** With the following objectives, the one of the India's significant Satellite project EDUSAT was launched-
  - To provide support for imparting education through low cost ground segments.
  - To reach the unreached children in every nook and corner of India, so that no child left out of the education program.
  - To provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students.
  - To improve quality of teaching-learning process.
  - To provide quality teaching resources.
  - To provide self-directed, self-paced and continual learning.
  - To strengthen the distance education efforts initiated by various agencies and educational institution all over the country.
  - To achieve quality and help the Indian masses to access to technical education.



CHECK YOUR PROGRESS

Q 1: When was the India's First thematic Satellite project launched?

.....

Q 2: What are the primary objectives of EDUSAT?

.....

8.3.1 Features and Functions of EDUSAT

The characteristics and functions of EDUSAT will help you to understand this thematic satellite project in a comprehensive way. Let's first try to grasp its essential features-

- **Features of EDUSAT:**
  - The first and foremost feature of EDUSAT is that this is a satellite that has been launched exclusively for education sector for the first time in history of India.
  - It covers all geographical area inside the country.
  - It can be used at all levels of education, from primary schools to professional courses
  - The spot beams used in the EDUSAT are more powerful and signals can be received with a smaller satellite dish.
  - Interactive television, computer conferencing, television broadcast, web based instructions, etc. are some of the widely used delivery modes provided by EDUSAT.
  - The EDUSAT is specially configured to relay through audio-visual medium, employing multimedia, multi centric system to create interactive classrooms.
  - Under the project of EDUSAT, satellites can establish connectivity between urban educational institutions
  - Another significant feature of EDUSAT is that connectivity

can be established between a large number of rural and semi-urban educational institutions with an aim to provide an educational infrastructure.

- EDUSAT is able to provide connectivity to many parts of the country with a capacity of providing more than half a million ground terminals in its full capacity.
- The EDUSAT network can be linked to existing terrestrial broadband, wireless and optical communication networks to provide seamless universal connectivity for tele-education.
- EDUSAT is expected to be in space for a period of seven years, during which it will help educational institutions to make up for the dearth of good teachers along with other things. This will be done by connecting classrooms which are at remote distances from each other.

- **The Functions of EDUSAT in Education:** The EDUSAT is specially configured for an audio visual medium, employing a digital interactive class room and multimedia multi-centric system. It is primarily launched for providing connectivity to the school, college and higher levels of education and also to support non formal education, including developmental communication. The primary functions of EDUSAT are mentioned below-
  - The first and foremost function of EDUSAT is to provide interactive and cost effective education to all people of India.
  - EDUSAT provides consistency to information to all levels of people.
  - EDUSAT serves as a useful tool to implement virtual class room in remote and rural schools. The teacher at the transmission end virtually becomes available to all the virtual classrooms at the receiving end. This process can help in overcoming shortage of trained teachers if in service training is giving to the existing teachers in the most economical way.

- EDUSAT provides audio visual medium and interactive multimedia facility to the people.
- EDUSAT acts as a medium of opening up many possibilities like online teachings, video conferencing etc. for easy and effective educational process.
- EDUSAT provides live lecture session from the best and expert teachers.
- EDUSAT facilitates provision of equality in educational opportunity. Before establishing the EDUSAT quality classes and classes handled by experts benefited only urban students. But with the working of the EDUSAT students from rural area also can enjoy its benefit.
- EDUSAT enhances the distance education in the country, especially in medical, technical and higher education streams. The project will be run by the ISRO and IGNOU, the former providing the technical infrastructure and the latter developing courses and training teachers.
- EDUSAT facilitates the Students to see what they read in there textbooks and to do experiments with the help of multimedia technologies.

8.3.2 Advantages and Disadvantages of EDUSAT

EDUSAT is helpful for supplementing curriculum based teaching, strengthen education efforts, provide greater community participation, increase access, effective teacher training and access to new technologies through a well thought ground section, established in schools, colleges and other institutions. There are many advantages of EDUSAT.

Following are some of the advantages of EDUSAT-

- **Uniform Training to teachers:** EDUSAT is helpful to provide training simultaneously to a large number of geographical dispersed people, in the shortest time, with uniformity in training content.

- **Access to learning Resources:** Another advantage of EDUSAT is that it helps in providing access to best available learning resources, irrespective of the geographical location of learners.
- **More learning gain:** With the launch of EDUSAT, there is enhanced involvement of learners due to interaction capability, which leads to learning gains.
- **Location specific learning:** With EDUSAT, specific topics for specific locations are also possible along with the capability to share the same network by different users groups.
- **Economical in nature:** EDUSAT is economical in nature in the sense that significant savings in expenditure related to travel, logistics and replication of teaching infrastructure can be done.
- **Supplement conventional training:** It can effectively supplement conventional system of training and in some cases it can become a major components in the training system of Indian education.
- **Quality resources:** Another advantages of EDUSAT is its quality resources. It facilitates in improving the quality of learning content and resources delivered to students.
- **Audio-video effect:** EDUSAT has a major step over other conventional forms of distance learning, because it makes audio and visual stimuli available to students in the EDUSAT network. This attracts them and make their learning interesting.
- **Ease of dissemination:** This EDUSAT project has another advantage as it can ease the propagation of information to rural and distant population, pertaining to significant aspects like well-being, cleanliness and personality development.
- **Professional development:** EDUSAT is not beneficial for the students only, it is equally beneficial for the teaching fraternity as it helps the professional to update their knowledge base.

Disadvantages of EDUSAT:

In the above discussion, we have discussed about the advantages of EDUSAT and how it is helpful for improvement in educational sector in a country like India. But; nothing is perfect. As a satellite communication, it might have face some technical drawbacks. Some of them are mentioned here-

- **EDUSAT is time consuming:** As we know that Satellite manufacturing requires more time. As such as a satellite communication technology it takes time.
- **It is costly:** Satellite design and development requires higher cost, as such EDUSAT is costly. For a developing country like India, it is not cost effective.
- **It requires controlling:** Satellite once launched, requires to be monitored and controlled on regular periods so that it remains in the orbit. Irregularities and deficiencies in controlling may lead to unexpected circumstances.
- **Short span:** Satellite has life which is about 12-15 years. The projected life of the EDUSAT is 7 to 10 years. Due to this fact, another launch has to be planned before it becomes un-operational.
- **Redundant component:** Generally in satellite launching redundant component are used in the network design. This may incurs more cost in the installation phase. As such it becomes costly.
- **Complex process:** Satellite visibility from earth is for very short duration which requires fast satellite to satellite handover. This makes the whole system very complex.

Though EDUSAT is criticized for some of its disadvantages, but, it is one of the most significant satellite communication of India. EDUSAT serves as a useful tool to implement virtual class room in remote and rural schools. It covers all the people of India residing in any geographical area.



CHECK YOUR PROGRESS

Q 3: What are the demerits of EDUSAT as a satellite communication?

.....

8.4 TELECONFERENCING SYSTEM IN EDUCATION

Another new trends emerged in the education technology is Teleconferencing. You all have must heard the word-conferencing. Now-a-days, with the advent of technologies in modern era, education is not exception from the use of different conferencing. You must have participated in the online classes through different conferencing organized by your teachers or school especially in the time of pandemic. Thus, it has become a part of our education system. Hence you all must be acquainted with its concept. Teleconferencing means meeting through a telecommunications medium. It stands for the conferencing made possible among the participants even by remaining at a large distance from each other. It is a generic term for linking people between two or more locations by electronics. This mode of conferencing can be defined as an interactive group communication or a real time interaction between two or more people in two or more location through an electronic medium. On account of the use of a sophisticated electronic medium for communication, teleconferencing may bring people together under one roof even though they are separated by thousands of miles for the exchange of information and opinion. To know the history of teleconferencing, it must be added here that, teleconferencing was first introduced in the 1960 with American Telephone and Telegraph's pictures phone. Today it has vast potentiality on account of the great advances made in the field of communication through modern hardware and software technologies. The common factors that contribute to the shared definition of teleconferencing are-

- Use a telecommunication channel
- Link people at multiple locations
- Interactive to provide two-way communications
- Dynamic to require users' active participation

Basically, the word 'tele' means distance and 'conference' refers to consultations, discussions etc. Through teleconferencing two or more locations situated at a distance are connected so that they can hear or at a time both see and hear each other. It provides enough opportunities the distant sites to interact with each other and with the teaching end by using phone, fax, and e-mail. The interactions also occur in real time in the teleconferencing process. It means that the learners/participants and the resource persons are present at the same time from different locations and are also able to communicate with each other according to their convenient. Again in some situations, questions or any confusing topic can be faxed/e-mailed early for response by the resource persons.

- **Function of Teleconferencing:** From the above discussion we come to know that, teleconferencing is a kind of electronic communication between two or more people at a distance. From the educational point of view teleconferencing may connect multiple locations. The functions of teleconferencing in education and training are -
  - The first and foremost function of teleconferencing is to impart information.
  - Teleconferencing serves as a means of building attitudes among the students.
  - Another important function of teleconferencing is to provide role models to its users.
  - To upgrade different communication skills among the students and users.
  - It helps in sharing experiences
  - It facilitates problem solving skills.
  - Teleconferencing offers counselling to the students.

- Teleconferencing can also be used to conduct, supervise or guide project work.

8.4.1 Types of Tele conferencing

There are at least six types of teleconferencing- audio, audio graphic, computer, video, business television (BTV), and distance education. Following are the basic types of teleconferencing-

- **Audio Conferencing:** It is nothing but a natural extension of the person to person telephone call for enabling communication and conversation among more than two person at a time.
- **Video conferencing:** This kinds of conferencing helps both orally and with face-to face dialogue by making use of television and other audio system. In this type of conferencing, one can listen as well as view the faces and actions of the people interacting with another in the conferencing.
- **Computer conferencing:** This is the most common and widely used types of conferencing. In this kind of conferencing, participants are able to communicate with each other by making use of computer technology. In this conferencing, one can communicate text and graphics to participate who may access it with the help of own personal computers. One can also view the faces and actions of the people under conversation through web cameras. Computer conferencing has an extra advantage as it permits people to participate at different times according to their convenience. Here the transmitted communication may be stored for being used by the participant later on at their convenience. In this way, all participants need not be on line at their computer terminals at the same time.

However, practically in most situations, teleconferencing is always aimed for having total interaction matching with the true spirit of face-to face conferencing. For this purpose, a synthesis of the audio-video and computer conferencing is employed. Sometimes,

people just adopt a synthesis of any of the above two or other times audio and video modes are well integrated to computer conferencing. In this way, different configuration teleconferencing system may emerge from the possible synthesis of the different modes of teleconferencing. One of such teleconferencing is-

Video conferencing facilitated by computer technology: It possesses tremendous possibilities and wide educational application for the best possible outcomes of the teleconferencing system. It is one of the most widely used and practice teleconferencing in the educational spectrum at present time. It has now made quite easy for the students sitting in a classroom in any part of country to edit and discuss a project with students of other country. These students can see real time video image of a classroom in a distant location. The learner can type the message on the screen in a "Chat Window" as they smile at each other on the screen. With the document camera, they can share the slides. Moreover, they can easily exchange information, have conversation and get immediate feedback through such lively information provided through this mode.

8.4.2 Uses of Teleconferencing

Teleconferencing is essentially a means for communication and training. At the same time it can be used for the educational purpose. Also it can be used for some other purposes like information dissemination, guidance in response to policy, consultations with experts, focused group discussions, interviews, etc. Following are the areas where teleconferencing is used as an important means-

- Delivery of full courses, lessons, tutoring, project work as well as required training can be provided to the students through teleconferencing.
- Delivery of certificate level courses for professional development too can be provided to the students through teleconferencing. These courses can be modular and multi-media in nature

comprising print, contact programmes, and audio-video conferencing.

- Introduction of short or new courses in skill development, vocational training, professional development, and to address problems that are related to introduction of new curriculum, and also tutoring in difficult areas of the curriculum.
- Remedial learning and off-hours teaching can be provided with the help of teleconferencing.
- Enrichment, updating, guidance to additional learning resources, extension of existing courses are also possible through teleconferencing.
- Along with the general teaching learning process, teleconferencing is also helpful for interaction by students with scientists, experts, policy makers, etc. to obtain multiple perspectives on any particular issues according to their requirements.
- Apart from academic activities, teleconferencing is useful in administrative matters like problems solving and counseling on admissions, examination, status of courseware materials distribution, guidance and advice on course content, expectations, assignments, grading, credits, etc.
- Training and Development Teleconferencing is used to provide training and staff development for capacity building in agriculture, health, nutrition, family welfare, etc. in remote rural areas.
- Technology for Education and Training Teleconferencing has been effectively used for empowerment of women and local self-government bodies and training of grass root workers spread over large geographical areas.
- Professional and Medicinal Courses and Services Medicine is an area in which teleconferencing is being increasingly used.
- Hospitals can provide medical services to remote areas with expert diagnosis and medical advice through the use of teleconferencing.

Similarly, many professional training institutes are using the teleconferencing mode to provide quality teaching support to widely dispersed student community. Thus we can say that now, in almost all the field, teleconferencing is widely appreciated and used for transmission of information and facilitation of smooth communication.

8.4.3 Advantages and disadvantages of Teleconferencing

Teleconferencing has lots of positive outcome for which it is globally welcomed and accepted. It offers a number of advantages to organizers, administrators, educators and learners. Such as-

- It provides learning to geographically disperse large groups.
- It is economical as for organizations, delivery costs are reduced with resultant cost benefit in terms of time, traveling and spread of resources over large groups
- It makes the best use of the available resources by expanding the learning opportunity and taking the resources to the learners.
- It overcomes time or scheduling problems for the learners who can assemble at a learning center for a limited period only because of their full time or part time work, and family and community commitments.
- It can be designed to meet local specific requirements of training in terms of content, language and conditions.
- By using animation, graphics and other techniques, teleconferencing is good at showing processes for demonstrations and experiments, thereby concretizing learning.
- By conveying sights, sounds, and the spirit of the subject, it provides a more rounded view of an issue.
- The element of interactivity in teleconferencing is encouraged through dialogue and by stimulating responses to situations and visuals. The opportunity of dialogue allows the learners to discuss, question, and challenge issues.

- Interactivity gives a sense of participation and an active environment for learning. The learners feel themselves to be a part of the 'real-life' learning situation.
- For the field functionaries in remote rural areas, it reduces the sense of isolation, encourages sharing of concerns and ideas, and helps solve their problems.

Disadvantages of Teleconferencing

The above mentioned points help you to see the strength of teleconferencing, but it is not free from criticism, teleconferencing is criticized for the following reasons-

- One of the demerits of teleconferencing lies on the technical failures with equipment
- It is being criticized for unsatisfactory complex interpersonal communication, such as negotiation or bargaining.
- It is impersonal in nature as it is less easy to create an atmosphere of group rapport.
- Lack of participant familiarity with the equipment is another one.
- Acoustical problems within the teleconferencing rooms is a common.
- Difficulty in determining participant speaking order is another demerits of teleconferencing, like frequently one person monopolizes the meeting.
- It takes more time for greater participant preparation and preparation.
- It is informal in nature, one-to-one or social interaction is not possible via teleconferencing.

To minimize some of the potential problems as mentioned above, users should carefully evaluate their meeting needs and goals to determine if teleconferencing is appropriate. Users should also assess their audience.



CHECK YOUR PROGRESS

Q 4: State two merits and demerits of teleconferencing each.

.....

8.5 COMPUTER ASSISTED INSTRUCTION (C.A.I.)

As we all know that computer is the best gift to human kind, science and technology have ever gifted. Now, everything is computerized. From banking to education, use of computer is a common practice. Many new trends have been added to educational technology. One such is Computer assisted instruction. As the name suggest, it stands for the type of instruction carried out with the help of a computer as a machine. The computer is said to be ahead of the teaching machine on account of its capacity of doing more work and multiple types of works at the same time for an unlimited number if individual learners than the teaching machine. The instructional work so carried out with the help of computer is generally known as computer assisted Instruction, which is shortly named as CAI. It is relatively a new and developed concept than teaching machine and programmed learning - oriented instructional technology. It is basically an instructional technique based on the two way interaction of a learner and a computer with the objectives of human learning and interaction.

- **Definitions of CAI:** In the words of Hilgard and Bower (1977), "Computer assisted instruction has now taken as so many dimensions that it can no longer be considered as a single derivation of the teaching machine or the kind of programmed learning that skinner introduced"

According to Bhatt and Sharma (1992): "CAI is an interaction between a students, a computer controlled display and a response entry device for the purpose of achieving educational outcomes"

On the basis of the above definitions, CAI can be considered as a method of instruction in which there is purposeful interaction between a learner and the computer device, having useful instructional material as software, for helping the individual learner achieve the desired instructional objectives with his own pace and abilities at his command.

- **Types of CAI:** CAI can take variety of forms for providing self-individualized instruction to a learner depending on the available computer services. The different types of CAI are discussed below-
- **Informational Instruction:** This type of CAI helps the learner to get desired information he needs. Here, the computer can serve the role of an enquiry officer to respond to students; enquiry with answers it has stored. It provides minimal interaction between the students and the computer programme. The sole purpose of this type of CAI is to provide essential information for the acquirement of concepts and skills.
- **Drill and practice programmes:** This type of CAI provides the learner with different types of drill and practice programmes covering specific topics related to a particular subjects. Through these, the service of the computer can be properly availed for providing practice in something already learned in some other ways. It helps in the development of a variety of skills in the students. The computer is known to have a good memory for the errors of the learners and therefore, it proves a very effective teacher in providing the student proper material for drill and practice.
- **Tutorial type computer assisted instruction:** In this type of CAI, the computer are engaged in actual teaching. Here, the computer play effectively the role of a tutor by maintaining a perfect interaction and dialogue with the individual students. The tutorial pregame are prepared not only to have instruction in the particular topic, but also to provide specific practice, having proper track of the students' difficulties and performance and help the students to move on the path of progress according to their own pace, abilities and requirement.

- **Educational Game Types:** In this type of CAI, the learners are provided with a variety of well-designed computer games. It is to be mentioned here for you that, these games should not be confused with academic type games. The purpose of this games are only to provide intellectual challenge, stimulation of curiosity and serve as a source of motivation to the individual learners. In course of learning, these games can be used as a source of review or act as a reward for some accomplishment for the learner.
- **Simulation Type Instruction:** Simulation is used as a technique for providing training to the learners. As such simulation instruction provides powerful learning tools for them. With the carefully prepared programme, the students are made to face real or individualized situation. They have to play an active role and are required to take decisions that have consequences.
- **Problem Solving Type Instruction:** Another important types of CAI is problem solving instruction which focuses on the process of finding an answer to a problem rather than the answer itself. Here, the students are provided with programmes that can make them think about the ways and means of solving the problem systematically. Here, in this type of CAI, with the concrete ways suggested in the programme, the students can analyse the problem into its small constituents and they are able to devise the systematic procedure for its solution. One of the best known problem solving instruction is LOGO, which is a procedure oriented language based on the learning theory of Jean Piaget.
- **Practical Work Oriented Instruction:** This type of CAI can provide valuable help in supplementing laboratory and other practical work. Here, a student can learn so many things about the science experiments before actually performing them in his practical class by watching and following computer programme made for this purpose. Moreover, the students can avail necessary skills and experiences about practical tasks in other field before actually engaging in the practical activities.

- **Learning affairs-managing type Instruction:** Here, in this type of CAI, the computer assisted programme provides valuable help in managing and supervising the learning affairs of the students. They can have a proper check over the learning activities of individual students by identifying their academics weaknesses through extensive diagnostic testing and to prescribe educational programme to meet their individual needs.

8.5.1 Use of C.A.I

As discussed above, CAI is an important means of carrying out instructional work. We have discussed different types of CAI. The computer assisted instruction meant for auto -individualized instruction rest on the following uses-

- **Instruction for a number of learners at a time:** CAI is very much useful to provide instruction for a number of learners at a time. It can serve at a time thousands of learners.
- **Individualized Instruction:** CAI is used to provide individualized instruction to the learners according to his ability and interest in particular subject. CAI provides individualized instructional material and help with the help of the computer.
- **Realization of set objective:** CAI is used to establish interaction between the individual learner and the computer devices, which helps in the realization of set instructional objectives.
- **Automatic recording of the learners' performance:** Another usefulness of CAI is its automated recording of the learners' performance. In CAI, all the information related to learners' quarries and difficulties, and their learning outcomes are recorded by the computer device.
- **Planning Instruction:** CAI is very much helpful in planning needed instruction to the individual learners for their proper advancement.

- **Variety in the use of methods and techniques:** CAI is used to provide variety of information and instruction through variety of methods and techniques. CAI assumes that every learner cannot be benefitted through a single method.
- **Audio-visual effect:** CAI is used to provide instruction to the learners with the audio-visual effect by the use of computer devices. This not only help the learners to get motivated but to improvise their performance.
- **Attending learners' response:** Another usefulness of CAI lies on attending learners' response. Here the individual students takes benefit of the displayed material and response to it. These responses are attended by the computer for deciding the future course of instruction displayed to the learners.



CHECK YOUR PROGRESS

Q 1: State three major uses of CAI.

.....



8.6 LET US SUM UP

After going detailed through the unit, it can be summarized as-

- EDUSAT is a satellites that have been launched to establish connectivity between educational institutions in urban regions and rural areas.
- This EDUSAT was launched by ISRO on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01).
- The projected life of the EDUSAT is 7 to 10 years and it can cover whole geographical India
- EDUSAT is a collaborative project of the Union Ministry of Human Resource Development, ISRO, Indira Gandhi National Open

University and State Departments of Education

- The objective of EDUSAT are -to provide support for imparting education through low cost ground segments, to reach the unreached children in every nook and corner of India, so that no child left out of the education program, to provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students etc.
- The first and foremost feature of EDUSAT is that this is a satellite that has been launched exclusively for education sector for the first time in history of India.
- Some of the advantages of EDUSAT are-Uniform Training to teachers, access to learning Resources, more learning gain, location specific learning etc.
- Some of the disadvantage of EDUSAT are it time consuming, it is costly, it requires controlling etc.
- Teleconferencing can be defined as an interactive group communication or a real time interaction between two or more people in two or more location through an electronic medium.
- The major types of teleconferencing are- Audio Conferencing, Video conferencing, Computer conferencing.
- Video conferencing facilitated by computer technology is one of the most widely used and practice teleconferencing in the educational spectrum at present time.
- Some of the functions of teleconferencing are-imparting information, guidance, sharing experience etc.
- The CAI is basically an instructional technique based on the two way interaction of a learner and a computer with the objectives of human learning and interaction.
- In the words of Hilgard and Bower (1977), "Computer assisted instruction has now taken as so many dimensions that it can no longer be considered as a single derivation of the teaching machine or the kind of programmed learning that skinner introduced"

- The different types of CAI are-Informational instruction, drill and practice, problem solving instruction etc.

8.7 FURTHER READING

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4) Sharma A. R (2007): Educational Technology, Vinod Pustak Mandir, Agra-2
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8.8 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: This EDUSAT was launched on September 20, 2004 from the Satish Dhawan Space Centre, in Sriharikota, Andhra Pradesh by the Geo-Synchronous launch vehicle GSLV (F01)

Ans to Q No 2: The primary objectives of EDUSAT are-

- To provide support for imparting education through low cost ground segments.
- To reach the unreached children in every nook and corner of India, so that no child left out of the education program.
- To provide proper feedback or guidance to the learners and act as a facilitator between the experts and the students.
- To improve quality of teaching-learning process.
- To provide quality teaching resources.
- To provide self-directed, self-paced and continual learning

Ans to Q No 3: The demerits of EDUSAT as a satellite communication are-

- **EDUSAT is time consuming:** As we know that Satellite manufacturing requires more time. As such as a satellite communication technology it takes time.

- **It is costly:** Satellite design and development requires higher cost, as such EDUSAT is costly. For a developing country like India, it cost a lot.
- **It requires controlling:** Satellite once launched, requires to be monitored and controlled on regular periods so that it remains in the orbit. Irregularities and deficiencies in controlling may lead to unexpected circumstances.
- **Short span:** Satellite has life which is about 12-15 years. The projected life of the EDUSAT is 7 to 10 years. Due to this fact, another launch has to be planned before it becomes un-operational.

Ans to Q No 4: The two merits of teleconferencing -

- It provides learning to geographically disperse large groups.
- It is economical as for organizations, delivery costs are reduced with resultant cost benefit in terms of time, traveling and spread of resources over large groups

Two demerits of teleconferencing-

- One of demerits of teleconferencing lies on the technical failures with equipment
- It is being criticized for unsatisfactory complex interpersonal communication, such as negotiation or bargaining.

Ans to Q No 5: Three major uses of CAI are-

- **Instruction for a number of learners at a time:** CAI is very much useful to provide instruction for a number of learners at a time. It can serve at a time thousands of learners.
- **Individualized Instruction:** CAI is used to provide individualized instruction to the learners according to his ability and interest in particular subject. CAI provides individualized instructional material and help with the help of the computer.
- **Realization of set objective:** CAI is used to establish interaction between the individual learner and the computer devices, which helps in the realization of set instructional objectives.

8.9 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words)

Q 1: What is EDUSAT?

Q 2: What are the feature of EDUSAT?

Q 3: What is Teleconferencing? What are its functions?

Q 4: What is CAI?

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: Discuss the functions of EDUSAT.

Q 2: Critically analyze EDUSAT.

Q 3: What are advantages and disadvantages of Teleconferencing? Discuss

Q 4: Elaborate the types of CAI with its relevance in present education system.

*** ***** ***

UNIT 9: MICRO-TEACHING

UNIT STRUCTURE

9.1 Learning Objectives

9.2 Introduction

9.3 Concept of Micro-teaching

- 9.3.1 Characteristics of Micro-teaching
- 9.3.2 Objectives of Micro-teaching
- 9.3.3 Importance of Micro-teaching
- 9.3.4 Phases of Micro-teaching
- 9.3.5 Assumptions of Micro-teaching
- 9.3.6 Merits or Utility of Micro-teaching
- 9.3.7 Limitations of Micro-teaching

9.4 Concept of Teaching Skills

- 9.4.1 Different Teaching Skills

9.5 Let Us Sum Up

9.6 Further Reading

9.7 Answer to Check Your Progress

9.8 Possible Questions

9.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the meaning of micro-teaching and teaching skills;
- highlight the characteristics of micro-teaching;
- elaborate the phases of micro-teaching;
- identify the merits and demerits of micro-teaching;
- discuss different teaching skills.

9.2 INTRODUCTION

Before going into the details of concept of micro-teaching and teaching skills, we must know that what is teaching? To understand the meaning of teaching we can refer to the definition of Burton "Teaching is the

process of stimulation, guidance, direction and encouragement of learning". In operational terms we can also state that teaching is imparting knowledge or skill. We all know that teaching is not only an art but also a science which involves various skills and techniques of teaching. In this unit we are going to learn about a special technique called 'Micro-teaching'. If we mark the history of this technique, it can be traced that microteaching is a teacher education technique developed by the School of Education at Stanford University and first applied as a combined training and diagnostic tool in Stanford's teacher intern program in 1963. Hence, in this unit you will be able to learn about the entire microteaching technique and its merits and demerits in the process of teaching.

9.3 CONCEPT OF MICRO-TEACHING

Micro-teaching goes to mean is a scaled-down teaching process or a small form of teaching practice meant for the teacher trainees or the pupil teachers undergoing training. This technique has been developed at Standford University to serve 3 purposes: (1) as preliminary experience and practice in teaching, (2) as a research vehicle to explore training effects under controlled conditions, (3) as an in-service training instrument for experienced teachers. The term "Micro-teaching" was originally used by Dwight.W.Allen, Robert Bush, and Keith.A.Acheson of Standford University, California in 1963. It is a model plan of teacher training which aimed at bringing about desired changes in behaviour of teacher trainees by acquiring new skills in teaching. The skills which will be acquired by a teacher after practicing micro-teaching are the use of blackboard, asking of questions, use of illustrations, presentation of the lesson, fluency in delivery, use of reinforcement and development of pupil's participation and classroom communication etc. It is training concept that can be applied to both pre-service and in-service teachers for their professional development. In micro-teaching the procedure of teaching is basically scaled down. It is scaled down in terms of class and time and even students. This specific teaching skill need to be trained and habituated to the teacher trainees through

repeated practice and by making necessary correction. For this purpose, the usual classroom situation is scaled down by reducing the size from 10-5 students and economising time from 10-5 minutes. The content of teaching is also reduced to small unit in relation to the time-factor. In this process expert teacher-educator are used in making observation and sophisticated electronic equipments like video-tapes are used in recording of teaching presentation in making necessary correction to it. Microteaching can be in fact termed as mini form of ideal teaching.

Microteaching has been defined in number of ways. Some selected definitions are given below:

D.W Allen defines the concept as follows, "Micro-teaching is a scaled down teaching encounter in class size and class time."

Robert Bush has maintained, "Micro-teaching is a teacher education technique which allows teachers to apply well defined teaching skills to a carefully prepared lesson in a planned series of 5-10 minutes encounter with a small group of real classroom students, often with an opportunity to observe the result on video tapes."

According to Allen and Eve, "Micro-teaching is a system of controlled practise that makes it possible to concentrate on specified teaching behaviour and to practice teaching under controlled conditions."

According to B.K Passi and M.S Lalita, "Micro-teaching is a training technique which requires student teachers to teach a single concept using specified teaching skill to a number of pupils in a short duration of time."

According to Allen and Cooper, "Micro teaching is a teaching situation which is scaled down in terms of time and numbers of students. Usually, this has meant a four to twenty-minutes lesson involving 3 to 10 students. The lesson is scaled down to reduce some of the complexities of the teaching acts, thus allowing the teacher to focus on selected aspect of teaching."

9.3.1 Characteristics of Micro-teaching

On consideration of the concept and the various definitions of micro-teaching, following major characteristics may be drawn:

- **Training of Specific Skills:** Micro-teaching is a device for teacher-trainees to train their specific skills. For this purpose, small units or contents of lesson are selected to give practical experience in teaching.
- **Controlled encounter:** It is a scaled down teaching method to control the process of teacher's encounter. It is guided by the principle of economy of time and effort in teaching. Here, the class size is reduced to 5-10 students, time limit reduced to 10-5 minutes and the content of teaching is limited to small units.
- **Individual Teaching:** Here attention to teaching is focussed on one teacher in acquisition of his individual skill in the act. Repetition in teaching is continued till the required skill is attained.
- **Expert Observation:** Expert and trained teacher educator is appointed to make clear observation of the teacher trainee in acquisition of the required skill in teaching. It is therefore a science and a realistic approach to objective teaching of the pupil teacher.
- **Rigorous Method:** Micro-teaching is different from usual classroom teaching. It is more carefully planned and rigorously executed method of teaching. Here, teaching of trainees are very carefully observed and recorded by using video-camera for subsequent observation and modification of presentation.
- **Immediate Feedback:** This training methods provides immediate feedback in learning of the pupil teachers. They perform the teaching skills after receiving demonstration from the experts. There is the process of teaching and re-teaching on the basis of feedback.



CHECK YOUR PROGRESS

Q 1: Who developed the concept of Micro-teaching?

.....

Q 2: What were the main purposes for developing Micro-teaching?

.....

9.3.2 Objectives of Micro-teaching

The technique of micro-teaching can be used to achieve these objectives:

- To enable the teacher-trainees to learn and assimilate new teaching skills under controlled conditions.
- To enable the teacher-trainees to gain confidence in teaching and mastery a number of teaching skills on a small group of pupils.
- To utilise the academic potential of teacher-trainees for providing much needed feedback.
- To give the teacher-trainees training in the component skills of teaching at the pre-service level.
- To gain maximum advantage with little time, money and material.

9.3.3 Importance of Micro-teaching

Micro-teaching is very important for a teacher for their professional development as it intends to develop knowledge, skills and professional attitude of a teacher-trainee. In this context we can highlight the points suggested by Allen in 1970 regarding importance of Micro-teaching. They are as follows:

- Micro-Teaching is a real teaching situation but the number of students and time is scaled down into small portion. This is different to simulated teaching. In the Micro-Teaching the students are peers who play a role as a student. After the teaching process the peers will give the feedback on the teacher's performance.
- The teacher can get the feedback from the supervisor, peers, or video records directly to help the teacher to develop their weaknesses in teaching performance. The information can be the aids for his/her future teaching in the real classroom.

- Micro-Teaching allows the teacher to focus on the acquisition of teaching skills through the selection of only one standard of competence. Thus, it helps the teacher reduce the complexity of teaching in the normal classroom.
- Micro-Teaching will not endanger student if the teacher fails in teaching. It has low risk situation for both students and the teacher, and the teacher is allowed to choose the topic of lesson that he/she greatest capability on it.
- Micro-Teaching provide a more conducive classroom where the teacher can prepare themselves to be not anxiety when they face the real classroom, and choose some learning strategies in the real large classroom with various backgrounds of students.

9.3.4 Phases of Micro-Teaching

Micro-teaching method involves a series of attempts in its teaching procedure. It indicates a systematic and scientific plan of teaching in the acquisition of required skill. Their nature and procedure may be presented below:

- **Explaining the Skill:** Firstly, in micro-teaching, a clear concept of the true nature of skill is explained to the teacher trainees prior to their teaching encounter in the classroom. The skill is defined to them and its related teaching behaviour is made clear in the mind.
- **Demonstration:** Necessary physical demonstration relating to the concept of requisite teaching skill is presented to them. Such ideal demonstration is shown by using the video-recording collected for the purpose.
- **Preparation of the Plan:** Prior to facing the classroom, the teacher-trainees prepare the lesson plan that serves as a guide to his teaching. The plan of lesson is prepared so that a teacher can cover the schedule time limit of 5-10 minutes.

- **Teaching Encounter:** After preparation of the lesson plan the trainee goes to the classroom to make the teaching encounter with the students. The teacher presents the content of teaching in accordance with the plan prepared. It helps the teacher trainees to remove the sense of hesitation and gain self-confidence for teaching. The expert observer also sits in a corner of the room to note down the points of observation.
- **Discussion or Feedback:** On completion of teaching the discussion or feedback session begins. The expert observer opens up the discussion and gives his views on the vital points of observation. The expert also suggests the ways and means to improve or make the trainees presentation more effective. This is called feedback and is considered as a more important step in micro-teaching.
- **Re-plan:** Discussion session may reveal the necessary modification and correction to be brought to the plan presented. Accordingly, the teacher-trainee re-plans or rearranges the plan in the light of expert suggestions. Such a step positively helps in the elimination of the defects and in making improvement over the earlier attempt.
- **Re-teaching:** The revised plan of lesson is again presented in the same classroom for the same duration, although the students may be different. This re-teaching may naturally claim to be more improved presentation over the earlier one.
- **Re-feedback:** Re-teaching is again followed by discussion or re-feedback with the teacher-educator in making re-assessment. It believes that repetition helps in elimination of the error that lead to more perfection in learning the skill.The diagrammatic representation of the micro-teaching technique is presented below:

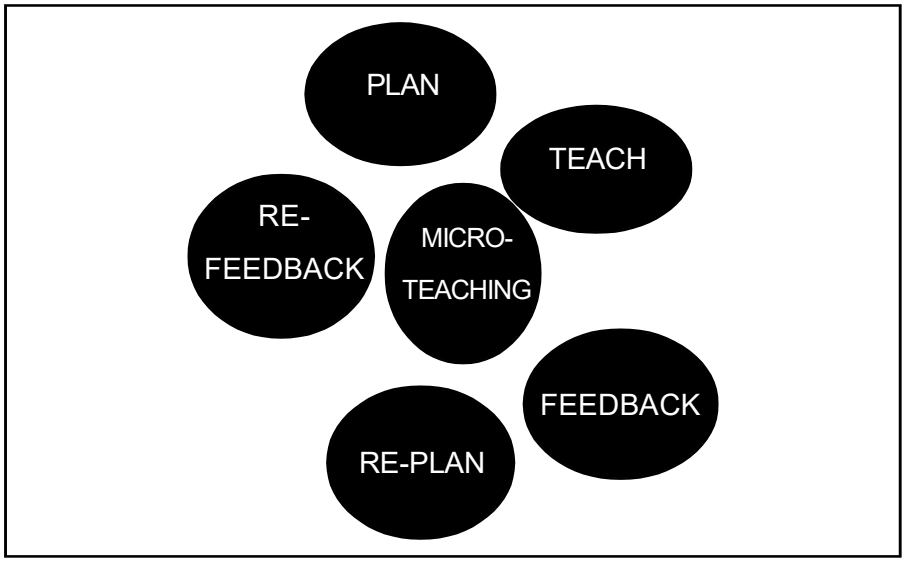


FIG: PHASES OF MICRO-TEACHING (9.1)



ACTIVITY 9.1

Organise a micro-teaching class with the help of your peer group and try to introduce a unit of study by yourself within a time frame of 8 minutes. Your counsellor will act as a supervisor. Try to record all the modifications forwarded by your experts and re-record after modification.

9.3.5 Assumptions of Micro-Teaching

The basic concept of this micro-teaching method lies with certain assumptions. These assumptions are as follows:

- The act of teaching is a complex process. Its complexity can be broken by making small unit of teaching of specific skills called micro-teaching.
- It believes that perfection in teaching can be attained through repetition, modification and correction of the teacher's attempt.
- It believes in the principle of flexibility and dynamism in attainment of perfection in teaching.
- It is of the view that the specific skills attained in small teaching may help to acquire the requisite art of teaching.
- It assumes that the skill acquired through micro-teaching may

be transferred to actual application in the classroom teaching by the trained teacher.

- Micro-teaching method therefore has good deal of perfection and pragmatic imagination behind its planning and execution.

9.3.6 Merits or Utility of Micro-Teaching

Micro-teaching method is well-recognised at present as a new innovative technology of teaching. Its major points of achievement may be presented below:

- **Minimize complexity in teaching:** It is difficult for a pupil-teacher at the beginning to encounter a big classroom with 40-50 students for a period of 40-45 minutes. Micro-teaching method simplifies and trains the teacher to be mentally prepared for that.
- **Develops self-confidence:** Introvert and newly appointed teacher naturally finds it difficult to make psychological adjustment in the classroom. The scale down teaching provision may naturally help to avoid such difficulty and develops self-confidence among them.
- **Understanding the skills of teaching:** Teaching is a craft that involves specific skills to be acquired through training. Skills like verbal deliberation, use of blackboard, asking questions, giving illustrations and the use of teaching aids etc. in the classroom may be trained through micro-teaching method.
- **Feedback Mechanism:** Feedback in teaching very effectively works in this method. The observation and necessary suggestion made by the teacher educator over the teaching encounter may serve the useful purpose in this regard.
- **Behaviour Modification:** Immediate feedback mechanism of this method leads to modification and correction of behaviour of the teacher trainees. Re-planning, re-teaching and re-feedback may lead to more perfection in the trainees behaviour.

- **Improving quality of teaching:** Improvement in the quality of teaching in the need of the hour today. In this regard micro-teaching is said to be the real teaching method. It helps the teacher trainees in modification of their teaching behaviour.
- **Research Tool:** This method may be used as a very effective research tool in respect of the study of the teacher's behaviour. Use of video recorder in recording teachers' classroom demonstration may provide objective data for perception of teacher's behaviour to the research workers.

9.3.7 Limitations of Micro-teaching

From the point of view of its workability one cannot overlook the limitations or drawbacks of this method. Following points need to be considered here:

- In the absence of well-trained and experienced teacher educator, micro- teaching method cannot be successful.
- The method itself is very time consuming. With a large number of teacher trainees, it appears to be a big problem.
- Teacher's own creativity in teaching does not find scope for its revelation and application here.
- Teaching when broken into small parts may lose its meaning and significance.
- Teaching ability cannot be viewed as the sum total of a number of skills to be trained one by one.
- Teaching only to 5 students for 5 minutes' time cannot be true representative of the usual classroom teaching. It is not the real teaching in this sense.
- Students here do not get scope for their interaction and communication within the limited period of time.
- The method itself is costly and time consuming. Use of video-recording re-teaching, re-feedback etc. are making the method more complicated.

9.4 CONCEPT OF TEACHING SKILLS

Teaching is a process that facilitates learning. The effectiveness of the teaching learning process adheres to the teaching skills of the teacher and the learning skills of the learner. Some of the key points of teaching skills are as follows:

- **Interactive Skills:** This interactive skill covers interpersonal skills, effective speaking skills and presentation skills in the teaching learning process.
- **Confidence:** The teacher needs to be confident enough to handle with the subject matter and should be ready to explain and answer to the questions probed by the learners.
- **Organisational Skills:** The pre-planned activities for the teaching considering the needs and interest of the learners should be developed by the teachers.
- **Team work:** The skill to work in team and groups is necessary for the teachers.
- **Conflict Management skills:** The teacher should possess conflict resolution skills to deal with the students or among the peer group.
- **Motivational skills:** It is a pre-requisite skill needed by the teachers since motivation pushes the students to gain interest and attitude towards the subject being taught.
- **Evaluation and feedback:** The teacher should be able to imply appropriate evaluation methods and techniques and give feedback to the students on their performance without any personal bias.

We can better understand the concept of teaching skills if we go through the following definitions of teaching skills:

According to Gage (1968), "Teaching skills are specific instructional activities and procedures that a teacher may use in his classroom. These are related to various stages of teaching or to continuous flow of teacher's performance."

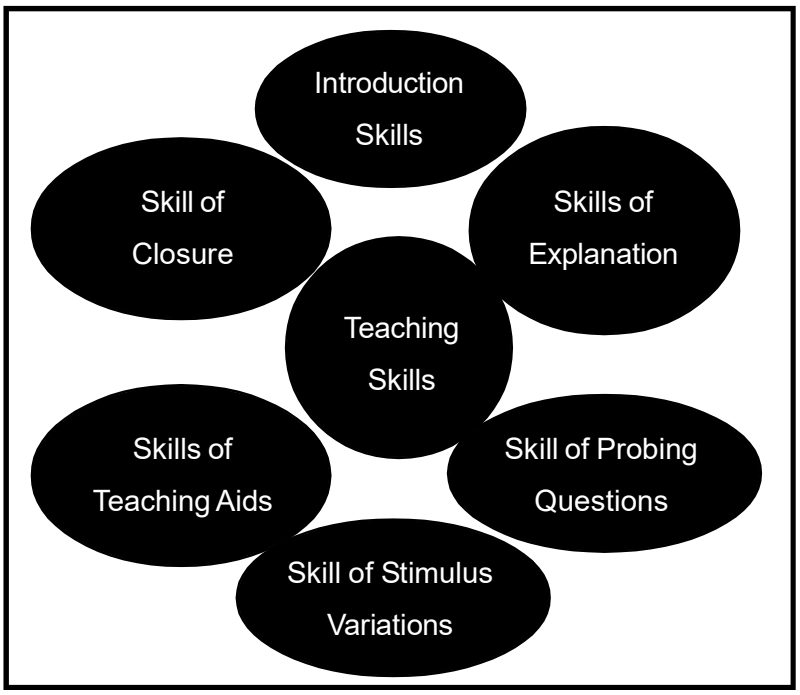
Passi (1968), says that a sets of teaching acts or behaviours performed with an intention to facilitate pupil's learning can be called teaching skills.

The Asian Institute for Teacher Educators (1972) defined teaching skills as those activities of teaching that are especially effective in bringing about desired changes in pupils and are related to continuous flow of teacher's performance.

Wragg (2005) sees teaching skills as strategies that teachers use to facilitate pupil's learning.

Kyriacou (2007) also defines teaching skills as discrete and coherent activities by teachers which foster pupil learning.

9.4.1 Different Teaching Skills





CHECK YOUR PROGRESS

Q 3: Which one of the following statements about "Micro-teaching" is false?

a) It is an innovative method to teach students.

b) The emphasis is on "how" to teach not "what" to teach.
c) It requires peers and students to observe skills of the teacher.
d) Specific areas of teaching skills can be assessed use the micro-teaching technique.



9.5 LET US SUM UP

- Microteaching is a teacher education technique developed by the School of Education at Stanford University and first applied as a combined training and diagnostic tool in Stanford's teacher intern program in 1963.
- This technique has been developed at Stanford University to serve 3 purposes:
  - as preliminary experience and practice in teaching,
  - as a research vehicle to explore training effects under controlled conditions,
  - as an in-service training instrument for experienced teachers.
- The term "Micro-teaching" was originally used by Dwight.W.Allen, Robert Bush, and Keith.A.Acheson of Stanford University, California in 1963.
- The main characteristics of micro-teaching are: training of specific skills, controlled encounter, individual teaching, expert observation, rigorous method, immediate feedback.



9.6 FURTHER READING

1) Kochhar, S.K (2004). Methods and Techniques of Teaching. New Delhi: Sterling Publishers Private Limited.
2) Bhatia & Bhatia (2007). The Principles and Methods of Teaching. New Delhi: Doaba House Publishers. Sampath ET. Al (2004). Introduction to Educational Technology. New Delhi: Sterling Publishers Private Limited.
3) Sharma, A. R. (1992). Educational Technology. Agra: Vinod Pustak Mandir.

4) Sharma, R. A. (2012). Educational Technology and Management. Meerut: R. Lall Book Depot.

9.7 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Micro-teaching was originally used by Dwight.W.Allen, Robert Bush, Keith .A. Acheson of Stanford University, California in 1963.

Ans to Q No 2: Micro-teaching technique was developed at Stanford University to serve 3 purposes: (1) as preliminary experience and practice in teaching, (2) as a research vehicle to explore training effects under controlled conditions, (3) as an in-service training instrument for experienced teachers.

Ans to Q No 3: a) It is an innovative method to teach students.

9.8 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words)

Q 1: Define micro teaching.

Q 2: Micro teaching is called individual teaching. Why?

Q 3: "Micro teaching is a rigorous method"- Explain the statement briefly.

Q 4: What are the objectives of micro teaching?

Q 5: Mention the different assumptions of micro teaching.

Q 6: What is meant by teaching skill?

B. Long Questions (Answer each question in around 300-500 words)

Q 1: Explain the main characterstics of micro teaching.

Q 2: Discuss the phases of micro teaching.

Q 3: Elaborately explain the importance of micro teaching.

Q 4: Discuss the merits and limitations of micro teaching from your point of view.

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UNIT 10 : FLANDERS' INTERACTION ANALYSIS CATEGORIES SYSTEM

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 Meaning of Classroom Interaction Analysis Technique

10.4 Flanders' Interaction Analysis Categories System (FIACS)

10.5 Assumptions of FIACS

10.6 Process of Flanders Interaction Analysis

- 10.6.1 Stage 1: Encoding Process
- 10.6.2 Stage 2: Decoding process
- 10.6.3 Stage 3: Interpretation of a 10x10 matrix

10.7 Advantages and Limitations of FIACS

10.8 Let Us Sum Up

10.9 Further Reading

10.10 Answer to Check Your Progress

10.11 Possible Questions

10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define the meaning of Classroom Interaction Analysis Technique;
- describe about Flanders' Interaction Analysis Categories System;
- explain the procedure of Flanders' Interaction Analysis Categories System; and
- highlight the advantages and limitations of the Flanders' Interaction Analysis Categories System.

10.2 INTRODUCTION

Dear learners, if you observe a classroom, then you will see a chain of instructional events going on inside the classroom which are indicative of classroom interaction. These instructional events may be like teacher

giving directions to students, expresses his/her ideas by lecturing, stimulates student participation by asking questions, classifying students ideas by applying them to the solution of the problem, praises and encourages students from time to time, diagnoses the feelings and attitudes expressed by students or inferred from their behavior, criticizes the behavior of students and so on. You will also observe that in response to the teacher's questions, the student also gives answers to the teacher or sometimes they initiate new ideas in the class or do some other activities. Presently, it is widely acknowledged that knowledge about classroom interaction analysis is very helpful to the practicing teacher to modify his/her behavior and make his/her teaching more effective and meaningful. In this Unit, we will describe in brief the nature of classroom interaction and - Flanders' Interaction Analysis Categories System (FIACS) as an important system of classroom interaction. This Unit will help you to develop an understanding and insight into the process of teaching-learning and the system of analyzing classroom interaction.

10.3 MEANING OF CLASSROOM INERACTION ANALYSIS TECHNIQUES

Classroom interaction analysis technique is considered as one of the most important innovations in pedagogical science for studying teaching behavior. This technique of analyzing teaching behavior has been developed with a view to improve classroom teaching. It provides insight into the nature of classroom communication and helps in modifying teachers' behavior. As such, when we try to understand the meaning of classroom interaction analysis we may perceive it as a technique for studying the chain of classroom events in such a fashion that each event can be identified and recorded. So, classroom interaction analysis may be defined as a technique for coding spontaneous verbal communication, arranging the data in a meaningful way and then analysing the results in order to study the pattern of teaching learning. The technique measures the teaching competency of teacher through systematic observations of his/her classroom activities. It

is based on the assumption that objective analysis of a teacher's classroom behaviour can give reliable information about the way the teacher behaves in the classroom. And it helps a teacher bring desirable modification in his/her classroom behavior and improve his/her interaction with students.

A system of interaction analysis essentially consists of the process of encoding and decoding. While encoding helps in recording the classroom events in a meaningful way, decoding is used in arranging the data into a useful display and then analyzing the results in order to study patterns of teacher behaviour and classroom interaction. So, a particular system of interaction analysis includes:

- A set of categories each defined clearly,
- A procedure for observation and a set of ground rules which govern the coding process,
- Steps for tabulating the data in order to arrange a display which aids in describing the original events, and
- Suggestions which can be followed in some more common applications.

The objectives of studying classroom interaction may be described as below:

- Classrooms interaction techniques provide objective data, systematic record on the teaching behavior of the teacher which may be helpful in giving definite instructions and guidance to the teacher for the improvement of his/her teaching;
- Identify the pattern of teacher behavior inside the classroom; and
- To evolve remedial strategies in reconstructing the whole concept of teaching methodology.



CHECK YOUR PROGRESS

Q 1: Define the term 'interaction analyses.

.....

10.4 FLANDERS' INTERACTION ANALYSIS CATEGORIES SYSTEM (FIACS)

A good number of interaction analysis techniques have been formulated by systematic research efforts and presently there are more than hundred techniques available for analysis of teacher behavior through classroom observation. Among these techniques, Flanders' Interaction Analysis Categories System (FIACS) is considered as one of the most popular systems. This system was developed by Ned. A. Flanders in the year 1959, at the University of Minnesota, in the form of a teacher training technique. According to Flanders, the purposes of interaction analysis are to help the teacher to develop and control his/her teaching behavior and to investigate the classroom interaction and the patterns of teaching events. It involves categorization of all sets of possible verbal behaviors of a teacher in the classroom while interacting with his/her students.

Flanders' Interaction Analysis Categories

The Flanders Interaction Category System (FICS) consists of ten categories of verbal behavior, seven of which are used when the teacher is talking, two are used when any pupil is talking and the last category indicates silence or confusion. The ten categories are grouped into three major sections which include the three possible conditions of communication in the classroom, viz., (i) Teacher talk, (ii) Pupil talk and (iii) Silence or confusion.

- **Teacher Talk:** The teacher talk comprises two types of behaviour, responsive (indirect influence) and initiative (direct influence). The first four categories belong to indirect influence and the latter three to direct influence.
  - The category of indirect influence covers those verbal behaviors of the teacher which gives the students greater opportunities to respond or maximize their freedom of action.
  - On the other hand, the category of direct influence exhibits those verbal behaviors of the teacher which tend to restrict or minimize the students' freedom of action.

- **Pupil Talk:** Similarly, pupil talk comprises two types of behavior, responsive or initiative. It includes two categories.
- **Silence or Confusion:** It includes all those behaviors that are not covered in the first and second sections. It includes one category

These sections and their ten categories with underlying components behaviors' descriptions are presented in Table 10.1.

TABLE 10.1: Flanders' interaction analysis categories

Sections	Flander's Interaction Analysis Categories (FIAC)
Teacher Talk	
A.	**Indirect Talk**
1.	**Accepts Feelings**
	• In this category, the teacher accepts the feelings of the students. • S/he feels that the students should not be punished for exhibiting his feelings. • Feelings may be positive or negative, predicting or recalling.
2.	**Praise or Encouragement**
	• Teacher praises or encourages student action or behavior. For example, jokes that release tension, but not at the expense of another individual, nodding head, etc. Praise and encouragement are the statements which carry the value judgment of approval • When a student gives an answer to the question asked by the teacher, the teacher gives positive reinforcement by saying words like 'good', 'very good', 'better', 'correct', 'excellent', 'carry on', etc.
3.	**Accepts or Uses ideas of Students**
	• It is just like the first category. But in this category, the students' ideas are accepted only and not his feelings. • If a student passes on some ideas or suggestions, then the teacher may respond to the ideas of students by acknowledging his/her ideas, modifying, or rephrasing ideas, applying, comparing or summarizing student's talk • The teacher can say, 'I understand what you mean' etc. Or the teacher clarifies, builds or develops ideas or suggestions given by a student.

4.	**Asking Questions**
	• Asking questions about content or procedures, based on the teacher's ideas and expecting an answer from the students. Questions may be open or closed, convergent/divergent. • Sometimes, the teacher asks the question but s/he carries on his/her lecture without receiving any answer. Such questions are not included in this category.
B.	**Direct talk**
5.	**Lecturing /Lecture**
	• Giving facts or opinions about content or procedure expression of his own ideas, giving his own explanation, citing an authority other than students, or asking rhetorical questions • This category has the highest frequency during a classroom interaction.
6.	**Giving Directions**
	• The teacher gives directions, commands or orders or initiation with which a student is expected to comply with: open your books or stand up on the benches or solve 5th sum of exercise 4.4 etc. • Such statements enhance teacher's authority and excessive use of this category leads to high dependence on the teacher.
7.	**Criticizing or Justifying Authority**
	• When the teacher asks the students not to interrupt with foolish questions, then this behavior is included in this category. • Teachers asking 'what' and 'why' to the students also come under this category. • Statements intended to change student behavior from unexpected to acceptable patterns, e.g., bawling someone out, stating why the teacher is doing what he is doing, extreme self-reference.
Student Talk	
8.	**Student Talk Response**
	• It includes the students talk in response to teacher's talk • Teacher asks a question, student gives an answer to the question. • Teacher initiates the contact or solicits pupil statements or structures the situation. Freedom to express own ideas is limited.

9.	**Student Talk Initiation**
	• Talk by students that they initiate. • Expressing own ideas; initiating a new topic; freedom to develop opinions and a line of thought like asking thoughtful questions; going beyond the existing structure.
10.	**Silence or Pause or Confusion**
	• Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

10.5 ASSUMPTIONS OF FIACS

- The normal classroom situation is usually predominant by verbal communication. So, this system is basically based on observing and analyzing verbal classroom interaction in a normal classroom situation.
- Verbal behaviors can be observed and recorded with higher reliability than most nonverbal behaviors.
- Verbal statements of a teacher are usually consistent with his/her nonverbal gestures and his total behavior.
- Teachers can establish a good classroom climate through the quality of teacher's verbal behavior.
- It is possible to modify teacher behavior through feedback.
- It is possible to ensure objectivity in the process of encoding classroom verbal behavior which in turn permits a system of measurement without disturbing other classroom events.



CHECK YOUR PROGRESS

Q 2: Describe Flanders' Interaction Analysis Categories.

.....

Q 3: What is meant by silence or confusion in FIACS?

.....

Q 4: Write any three assumptions of FIACS.

.....

10.6 PROCESS OF FLANDERS INTERACTION ANALYSIS

The Flanders 10-category interaction analysis system involves three stages:

Stage 1: Encoding Process (observation or recording of classroom events)

Stage 2: Decoding Process (construction of interaction matrix)

Stage 3: Interpretation of a 10x10 matrix

Now, let us discuss each stage in details:

10.6.1 Stage 1: Encoding Process

Encoding means observation or recording of the chain of events going on inside the classroom. This is performed by a trained observer. The requirements of this stage are as follows:

- The observer should require to train himself/herself for the proper recording and s/he must memorize code numbers in relation to a key phrase or word indicated against each category, e.g. 4 is for asking questions.
- The observer should meet the teacher personally whose classroom interaction has to be observed and an arrangement for the observations is arranged as per the needs and conveniences of the teacher.
- Proforma on which observations are made is a 20x20 form in which a 20 minutes episode can be recorded. This form has space for 400 code symbols and it provides space for making comments/notes.
- **Procedure of encoding:** The observer is required to sit in such a place in the classroom from where s/he can hear and see both the teacher and students without disturbing or interfering with the normal classroom activities. S/he notes down within every three seconds the code or category number which best

represents the interaction event just observed on a data sheet. Thus, the observer notes down about 20 observations in a minute on the data sheet. During the recording, the observer records the categories of the behaviours according to their numbers from top to bottom into the columns. Here, speed in recording is important. One lesson is observed for about 20 minutes and so, 400 frequencies (approximately) can be recorded. On the data sheet are recorded the full particulars of the teacher, i.e., name, qualifications, etc.

Certain ground rules: The task of encoding the classroom interaction is quite difficult a task to be performed which requires proper training, practice and care from the part of the observer. The objectivity and reliability of the observation is very critical to get the actual picture of the classroom interaction. For that, certain ground rules have to be followed for encoding which are mentioned as below:

Rule 1: When not certain to which two or more categories a statement belongs, choose the category which is numerically away from Category-5; e.g. for choosing between 3 and 4 choose 3, and for 8 and 9, choose 9.

Rule 2: If the primary tone of the teacher's behaviour has been consistently in initiative or responsive, do not shift it to the opposite classification unless a clear indication of shift is given by the teacher.

Rule 3: The observer should not be concerned with his/her biases or teacher's intent. S/he must be free from personal biases.

Rule 4: If more than one category occurs during the 3 seconds duration, then all these categories should be recorded. Each change in the category is also recorded. If no change occurs within 3 seconds duration that category number is repeated.

Rule 5: If a silence is longer than 3 seconds, record 10 for every 3 seconds.

Rule 6: When the teacher calls a child by his name, the observer ordinarily records 4.

Rule 7: When a teacher repeats a student's answer and the answer is correct, this is recorded as 2.

Rule 8: When the teacher repeats a student's idea and communicates that the idea will be considered or accepted as something to be discussed, record it as 3.

Rule 9: If a student begins to talk after another student, a 10 is inserted between 9's and 8's to indicate the change of students.

Rule 10: Reactions such as 'Okay', 'Yes' and 'All right' etc. are recorded as 2.

Rule 11: A teacher's joke which is not made at the expense of children is 2, but the joke makes fun of a child then it is recorded as 7.

Rule 12: Rhetorical questions are recorded as 5.

Rule 13: If the student gives a specific predictable answer to a narrow question, this is recorded as 8.

Rule 14: An 8 is recorded when several students respond in unison to a narrow question.

10.6.2 Stage 2: Decoding process

After recording or encoding the classroom events into ten categories, the observations are tabulated and converted on a 10x10 matrix table. This matrix table consists of 10 columns and 10 rows making 100 cells. Each number is entered in the form of sequence pairs, being used twice, firstly as the first number and secondly as the second number. The rows of the matrix represent the first number in the pair and the columns represent the second. Hence, each pair of numbers overlaps with the previous pair and such overlapping pairs of observations are entered in appropriate cells of the matrix.

In the matrix construction, one is to make sure that the entire series begins and ends with the same number. It is customary to add a 10 to the beginning and end of the series if it is not already present. So, the data should begin and end in category 10. If a 10 is

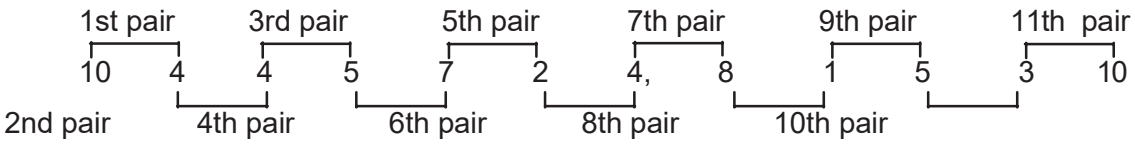
not mentioned in the data, the observer should add it at both ends. Now, let us understand the process of matrix construction with the following example:

Suppose that in an interaction analysis the observer has encoded or recorded the category numbers as 4, 4, 5, 7, 2, 4, 8, 1, 5, 3.

Let us put 10 before and after the series as;

10, 4, 4, 5, 7, 2, 4, 8, 1, 5, 3, 10.

Next, try to form pairs as:



After pairing, these are entered into the 10x10 matrix. The first sequence pair (10,

5) has been tallied in the cell located at the interaction of 10th row and 4th column. The next (4, 4) is tallied in the cell located at the intersection of 4th row and 4th column, and so on. The matrix is completed as shown in Table 10.2.

Table 10.2: Interaction matrix table

CATEGORY	1	2	3	4	5	6	7	8	9	10	Total
1					/						1
2				/							1
3										/	1
4				/	/			/			3
5			/				/				2
6											–
7		/									1
8	/										1
9											–
10				/							1
Total	1	1	1	3	2	–	1	1	–	1	11

In the matrix table, it should keep in mind that the total number of observations N will always be tabulated by N-1. In the above table, there are 12 category numbers (including the extra 10), which have produced a total of 11 tallies in the matrix.



CHECK YOUR PROGRESS

Q 5: What is meant by the encoding process in FIACS?

.....

.....

Q 6: Why are ground rules necessary for encoding in FIACS?

.....

10.6.3 Stage 3: Interpretation of a 10x10 matrix

The process of interpretation of interaction or observation data is often called decoding. Decoding the matrix table helps us in knowing what was going on inside the classroom in terms of teacher behavior and classroom interaction for communication. We can broadly see it in two broad aspects: (i) quantitative, and (ii) qualitative (Mangal, S.K. & Mangal, U. (2010). Essentials of Educational Technology. PHI Learning Pvt. Ltd., New Delhi. pp.373-379). The details of these two broad aspects are discussed below:

- **Quantitative Analysis of Teacher Behavior:** This analysis may be based on the following aspects:
  - Interaction categories
  - Area of interaction
  - Behavior Ratios
  - Interaction Variables

Let us discuss here only the first three aspects to understand how the matrix table of classroom interaction analysis is interpreted.

- **Interaction categories:** The observed data may be interpreted in the simplest way. Here the total of the column representing the use of various categories are taken for the interpretation. These are converted in percentages, which help in ascertaining the relative importance given to the use of various categories by a teacher. For example, if we take the matrix table 10.2 for interpretation then, by applying this method, we would be getting the percentage of categories given in Table 10.3.

Table 10.3: Percentage of categories for interpretation

Columns	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Total
Percentage	9.09	9.09	9.09	27.27	18.18	0	9.09	9.09	0	9.09	99.99

- **Area of interaction:** Flanders (1969) divided the tabulated matrix into 10 areas (Flanders, 1963), namely A, B, C, D, E, F, G, H, I and J for interpretation as shown in the Table 10.4:

Table 10.4: Area of Interaction in the Matrix Table

Area	Description	Categories Covered
Area A	It indicates the indirect influence of teacher talk.	It is calculated by combining the percentage of teacher statements falling into the categories 1, 2, 3 and 4.
Area B	It stands for direct influence of teacher talk.	It is calculated by combining the percentage of the categories 5, 6 and 7.
Area C	This area represents pupil talk.	It is computed by adding the percentage of categories 8 and 9.
Area D	It involves the silence or confusion category.	It is the percentage of category 10 in relation to total tallies.
Area E	It gives an index of teacher's dealing with students on an effective plane.	It represents a block of nine cells involving 1, 2, and 3 categories. It may be defined as the percentages of tallies in nine cells (1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1) (3, 2), and (3, 3) with respect to the total tallies.

Area F	This area is sensitive to difficulties that teachers may face with regard to direction and criticism in dealing with students.	It represents a block of four cells involving categories 6 and 7. Operationally, it is defined as the percentages of tallies in four cells (6, 6). (6, 7), (7, 6), and (7, 7) with respect to total tallies.
Area G	It indicates the teacher's responding to the termination of pupil talk with indirect influence.	It represents a block of six cells (8, 1), (8, 2), (8, 3), (9, 1), (9, 2) and (9, 3). Operationally, it is the percentage of the total of these six cells.
Area H	It indicates the teacher's responding to the termination of pupil talk with direct influence.	It represents a block of (8, 6), (8, 7), (9, 6) and (9, 7) cells. Operationally, it is the percentage of the total of these four cells.
Area I	It indicates the type of statements that trigger student participation. The students often respond to questions posed by the teacher and hence there is usually high tally loading in cells (4, 8), (4, 9), (5, 8), and (5, 9) and indicate the type of statements that trigger student participation. The students often respond to questions posed by the teacher and hence there is usually high tally loading in cells (4, 8) and (4, 9). A high loading on (5, 8) and (5, 9) indicates classroom drill directed by the teacher.	It represents a block of four cells (4, 8), (4, 9), (5, 8) and (5, 9).
Area J	It represents the sustained pupil initiation or response of one followed by the other.	It involves four cells (8, 8), (8, 9), (9, 8) and (9, 9).

- **Behaviour ratios:** The calculation of behaviour ratios may be done directly from the formulae constructed for this purpose. In this method, all column totals are converted into percentages of the matrix total and then calculate certain interaction or behaviour ratios. There are fifteen bahaviour ratios which are stated below one by one:

- **Teacher talk ratio (TT):** It may be defined as actions taken by the teacher that reflect the tendency of teacher talk. This teacher-talk (TT) is calculated by adding the frequencies 1 to 7 categories multiplying by 100 and dividing by the total tallies (N) of the matrix.

  TT= (1+2+3+4+5+6+7)/N x 100

- **Indirect teacher talk ratio (ITT):** It indicates the actions taken by the teacher which encourage and support pupil participation. Indirect teacher talk can be operationally defined by noting down the percentages of teacher statements falling into categories 1, 2, 3 and 4. It is calculated by adding the tallies 1, 2, 3 and 4 categories multiplying by 100 and divided by total number of matrix tallies (N) which can be presented as:

  ITT= (1+2+3+4)/N x 100

- **Direct teacher talk ratio (DTT):** It refers to action taken by the teacher which restricts students' participation. Expressing one's own views, through lectures, giving directions, and criticism with the expectation of compliance to restrict pupil-participation may be indicative of direct teacher's influence. Direct influence may be operationally defined by counting the percentage of teacher statements falling into 5, 6 and 7 categories. It is calculated by the following formula:

  DTT= (5+6+7)/N x 100

- **Pupil talk ratio (PT):** Pupil talk is defined as verbal activities of the pupils in response to the teacher. A pupil who asks to approve his/her work in order to make sure that it is satisfactory before going to the next step. Pupil-response can be operationally defined by noting down the percentage of student-talk falling into categories 8 and 9. It can be calculated by the formula: PT= (8+9)/N x 100

  In this formula, (8+9) stands for the addition of the frequencies of the 8 and 9 categories.

- **Silence or confusion ratio (SC):** The silence or confusion is defined as any event not included in other categories. Periods

of confusion in communication which is not understood by an observer or when it is difficult to determine who is talking is classified in this category. The silence or confusion can be operationally defined by noting down the tallies of category 10. The formula is as below:

$$SC = (10)/N \times 100$$

- **Indirect to direct ratio (I/D):** It involves the proportion of indirect influence behaviour pattern of the teacher. It can be defined operationally by noting down the proportion of indirect influence and direct influence of teachers. It can be computed by adding tallies 1, 2, 3 and 4 of categories and multiplied by 100 and divided by the total tallies of 5, 6 and 7 categories. The formula is,

$$I/D = (1+2+3+4)/(5+6+7) \times 100$$

- **Pupil initiation ratio (PIR):** It proposed to indicate what proportion of pupil talk is judged by the observer to the percentage of category 9. It can be calculated by multiplying the tallies of category 9 and 100 and dividing by the sum of all pupil talk or total tallies of categories 8 and 9. It is calculated by the formula:

$$PIR = (9)/(8+9) \times 100$$

- **Teacher response ratio (TRR):** It may be defined as an index presenting the tendency of a teacher to react to the ideas and feelings of the pupils. The TRR can be obtained by adding the frequencies of categories 1, 2 and 3, multiplying by 100 and dividing by the sum of categories 1+2+3+6+7. It is calculated by the formula:

$$TRR = (1+2+3)/ (1+2+3+6+7) \times 100$$

- **Teacher question ratio (TQR):** It shows the tendency of a teacher to use questions when guiding the more content-oriented part of the class discussion. The TQR is the percentage of all the statements related to category 4 and 5 which are classified in category 4. The TQR varies from teacher, solicits pupil reaction for ideas which the teacher considers important or as s/he

checks their understanding by asking questions. The formula is,

$$TQR = (4)/(4+5) \times 100$$

- **Content cross ratio (CCR):** It is an indication that the main focus of the class discussion becomes on the subject matter, that the teacher takes a very active role in the discussion and that attention to motivation and discipline is minimal. The CCR is found by calculating the percentage of all tallies that lie within the columns or rows of categories 4 and 5. It can be computed by the following formula:

$$CCR= (4) +5/N \times 100$$

- **Steady state ratio (SSR):** It reflects the tendency of teacher and pupil talk to remain in the same category for a period longer than three seconds. The higher the ratio, the less rapid is the interchange between the teacher and pupil on average. Operationally, it is the percentage of the frequencies in steady state cells (SSC) [(1, 1), (2, 2), (3, 3), (4, 4), (5, 5), (6, 6), (7, 7), (8, 8), (9, 9) and (10, 10)]. The formula is,

  SSR= Total Frequencies Steady State Cells/N x 100

- **Pupil steady ratio (PSSR):** It indicated the tendency of pupil talk to remain in the sense that for a period longer than three seconds. It is the percentage of the (8, 8) and (9, 9) out of categories 8 and 9. The formula is,

$$PSSR= (8, 8) + (9, 9)/ (8, 9) \times 100$$

- Instantaneous teacher response ratio (ITRR-89): It is an index of the teacher's tendency to praise or integrate pupil ideas and feelings into the class discussion when the pupil stops talking. The formula is,

ITRR-89= (8, 1) + (8, 2) + (8, 3)+ (9, 1)+ (9, 2) + (9, 3)/

= (8, 1) + (8, 2) + (8, 3) + 8, 6) + (8, 7) + (9, 1) + (9, 2)

+ (9,3) + (9, 6) + (9, 7) x 100

Where (8, 1), (8, 2), etc. stand for the tallies or frequencies of these cells.

- **Instantaneous teacher question ratio (ITQR-89):** It may be defined as the tendency of the teacher to respond to pupil talk with questions based upon his/her own ideas, compared to his/her tendency to lecture. It can be computed by the formula:

ITQR-89= (8, 4) + (9, 4)/ (8, 4 + 8, 5) + (9, 4 + 9, 5) x 100

- **Vicious circle ratio (VC):** It indicates the teacher's restrictive behaviour involving directions and self-justification, which is sensitive to difficulties faced by the teacher when the students are not complying satisfactorily. The formula is,

  VC = (6, 6) + (6, 7) + (7, 6) + (7, 7) /N x 100

- **Interpretation:** The index of behaviour ratios discussed above need to be interpreted against the norms, i.e. the standard normative expectation. Flanders tried to develop such norms for various grades in the U.S.A. These have also been developed to suit the Indian conditions. To get a clear picture on it, we are reproducing these norms in Table 10. 4 for class VIII.

Table 10.4**: Behavior ratio norms**

S. No.	Behavior ratio	Symbol	Developed by Flanders	Developed in Indian conditions
1	Teacher Talk	TT	70	67
2	Pupil Talk	PT	19	21
3	Silence/Confusion	SC	11	12
4	Teacher Response Ratio	TRR	35	26
5	Teacher Question Ratio	TQR	20	19
6	Pupil Initiation Ratio	PIR	15	12
7	Steady State Ratio	SSR	52	46
8	Pupil Steady State Ratio	PSSR	26	37
9	Content Cross Ratio	CCR	68	72

10	Instantaneous Teacher Response Ratio	TRR-89	67	48
11	Instantaneous Teacher Question Ratio	TQR-89	39	42

Source: Mangal, S.K. & Mangal, U. (2010). Essential of Educational Technology. PHI Learning Pvt. Ltd., New Delhi. P. 377

On the basis of the above mentioned Behaviour Ratio Norms table, we can identify the effective and ineffective teachers. The teachers exhibiting greater values of behaviour ratios mentioned on serial numbers, 2, 4, 5, 6, 8 and 11 than the norms provided above may be termed as effective teachers while those exhibiting greater values of behaviour ratio, as mentioned on serial numbers 1, 3, 7, 9, and 10 may be termed as ineffective teachers. So, here we may summarize that the teachers who have the greater values of pupil-talk, teacher response ratio, teacher question ratio, indirect teacher influence and pupil steady state ratio than the normative values are considered to be effective teachers. On the contrary, teachers who have higher teacher-talk, silence or confusion, steady state ratio, content cross ratio and direct teacher behaviour than their normative values are stated as ineffective teachers.

- **Qualitative Analysis of Teacher Behaviour:** Under this method, the following methods are employed for the analysis of the teacher behaviour:
- **Clockwise flow diagrams:** A clockwise flow diagram provides a visual display the sequence of activities of the classroom, i.e. "what event followed what event". So, it is very helpful to understand the nature and structure of classroom verbal behaviour. A flow diagram is drawn on the interpretation matrix. It can help to provide feedback to teachers to improve their teaching behaviour. A flow diagram may be drawn from an observation matrix as follows:

- Firstly, locate and encircle the cell with highest frequency in the matrix, as this sequence of the pair is which occurs most often. This encircled cell will be the starting point of presenting the flow of events.
- After locating the starting point, identify the event which is most likely to follow. The highest frequency in the row other than the starting point cell is marked as the second step of the flow point after locating the second point.
- Connect these two marked cells with a little looping arrow.
- By inspecting the column of the second point, the highest frequency of the cell is noted and encircled. It is connected by an arrow with the second step. It is essential that the flow of activities is presented clockwise. \

Flow diagrams are very useful to understand the sequence of events in the classroom very clearly. What events precede and what follows can be identified through flow diagrams. It also helps in locating the transition of events and the state of steadiness. Besides, flow diagrams help in making comparison between two matrices with normative expectation.

- **Box-flow diagrams:** Box-flow diagrams help to understand the intensity with which the events occurred in the class, the flow diagram may be converted into a box flow diagram. As a result of that, all the cells with frequency less than 10 are eliminated. So, the observer is able to look closely at those cells (events) which occurred with high intensity during classroom interaction.



CHECK YOUR PROGRESS

Q 7: What is meant by direct teacher talk ratio (DTT)?

.....

Q 8: What is meant by Clockwise flow diagrams?

.....

10.7 ADVANTAGES AND DISADVANTAGES OF FIACS

- **Advantages of Flanders' Interaction Analysis System:**

- It is a reliable and objective technique to understand classroom interaction analytically.
- As the system's rule is to take observation after every three seconds, it is ensured that the observer records almost all the behaviours of teachers and students.
- It helps to determine the classroom climate. For example, high teacher talk means a classroom dominated by teachers, whereas high student talk is indicative of a lively classroom.
- A teacher can control his teaching behaviour, so this system is well suited to be used as a mechanism of feedback device for the modification of teacher behaviour.
- It is used as an observation technique in pre-service and in-service teacher education programmes.
- It adds and supplements the training techniques such as micro teaching and team teaching.
- The system is employed as a research tool for analysing and studying teaching and teaching behaviour.

- **Limitations of Flanders' Interaction Analysis System:**

- The system does not describe the totality of the classroom activity. There is a probability of over-looking some important behaviour. And sometimes an unrecorded aspect may be more important than the recorded one.
- More emphasis is laid on teacher behaviour as compared to student behaviour.
- Since the categories are too broad, there is always a fear that an element of subjectivity gets introduced. Different people may differ on clarifying verbal statements.
- Major focus of the system is verbal behaviour whereas nonverbal behaviour is also equally important in classroom interaction

- Tabulation of data pairs into a 10x10 matrix is a time consuming process.
- It does not provide value judgement about good and bad teaching behaviours.
- The system is content-free. It is concerned primarily with social skills of classroom management as expressed through verbal communication. The technique provides no information about the quality of content.



10.8 LET US SUM UP

- Classroom interaction analysis is a technique for studying the chain of classroom events in such a fashion that each event can be identified and recorded.
- A particular system of interaction analysis includes: (a) a set of categories each defined clearly, (b) a procedure for observation and a set of ground rules which govern the coding process, (c) steps for tabulating the data in order to arrange a display which aids in describing the original events, and (d) suggestions which can be followed in some more common applications.
- Flanders' Interaction Analysis Categories System (FIACS) is considered as one of the most popular systems of classroom interaction analysis
- The ten categories of FIACS are grouped into three major sections, viz., (i) Teacher talk, (ii) Pupil talk and (iii) Silence or confusion.
- It is possible to modify teacher behaviour through feedback.
- The objectivity and reliability of the observation is very critical to get the actual picture of the classroom interaction.
- Decoding the matrix table helps us in knowing what was going on inside the classroom in terms of teacher behaviour and classroom interaction for communication.
- Teachers who have higher teacher-talk, silence or confusion, steady state ratio, content cross ratio and direct teacher behaviour than their normative values are stated as ineffective teachers.

- Box-flow diagrams help to understand the intensity with which the events occurred in the class, the flow diagram may be converted into a box flow diagram.
- FIACS can be used as a mechanism of feedback device for the modification of teacher behaviour.



10.9 FURTHER READING

1) Aggarwal, J.C. (2014). Essential of Educational Technology. Vikas Publishing House Pvt. Ltd., New Delhi.
2) Mangal, S.K. & Mangal, U. (2010). Essential of Educational Technology. PHI Learning Pvt. Ltd., New Delhi.
3) Sharma, R.A. (2008). Educational Technology. R. Lall Book Depot, Meerut.



10.10 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: Interaction analysis is defined as a technique for studying the chain of classroom events in such a fashion that each event is taken into consideration. Analysis of teacher behaviour helps the teacher to improve his teaching.

Ans to Q No 2: The Flanders Interaction Category System (FICS) consists of ten categories verbal behaviour, seven of which are used when the teacher is talking, two are used when any pupil is talking and the last category indicates silence or confusion. The ten categories are grouped into three major sections which include the three possible conditions of communication in the classroom, viz., (i) Teacher talk, (ii) Pupil talk and (iii) Silence or confusion.

Ans to Q No 3: Silence or confusion includes all those behaviours that are not covered by teacher talk and pupil talk.

Ans to Q No 4: Three assumptions of FICS are as below:

- Verbal behaviours can be observed and recorded with higher reliability than most nonverbal behaviours.

- Verbal statements of a teacher are usually consistent with his/her nonverbal gestures and his total behaviour.
- Teachers can establish a good classroom climate through the quality of the teacher's verbal bahaviour.

Ans to Q No 5: Encoding means observation or recording of a chain of events going on inside the classroom.

Ans to Q No 6: The objectivity and reliability of the observation in FICS is very critical to get the actual picture of the classroom interaction. For that, certain ground rules have to be followed for the encoding process.

Ans to Q No 7: It refers to action taken by the teacher which restricts students' participation. Expressing one's own views, through lectures, giving directions, and criticism with the expectation of compliance to restrict pupil-participation may be indicative of direct teacher's influence.

Ans to Q No 8: A clockwise flow diagram provides a visual display of the sequence of activities of the classroom, i.e. "what event followed what event".



10.11 POSSIBLE QUESTIONS

A. Short Questions (Answer each question in around 150 words)

Q 1: What are the objectives of studying classroom interaction?

Q 2: What is meant by Flanders' Interaction Analysis Categories System?

Q 3: What is meant by indirect talk and direct talk?

Q 4: How is the decoding process done in FIACS?

Q 5: Describe the Interaction matrix table.

B. Long Questions. (Answer each question in around 300-500 words)

Q 1: Describe Flanders' Ten Category System in detail.

Q 2: Discuss the process of quantitative analysis of teacher behaviour in the Flanders' system.

Q 3: Draw out the advantages and limitations of FIACS.

*** ***** ***

UNIT 11 : PROGRAMMED INSTRUCTION

UNIT STRUCTURE

11.1 Learning Objectives

11.2 Introduction

11.3 Meaning of Programmed Instruction

11.4 Definitions of Programmed Instruction

11.5 Nature of Programmed Instruction

11.6 Principles of Programmed Instruction

11.7 Objectives of Programmed Instruction

11.8 Stages of Programmed Instruction

11.9 Types of Programmed Instruction

11.10 Merits of Programmed Instruction

11.11 Demerits of Programmed Instruction

11.12 Let Us Sum Up

11.13 Further Reading

11.14 Answer to Check Your Progress

11.15 Possible Questions

11.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know the meaning and definitions of programmed instruction;
- discuss the nature of programmed instruction;
- enumerate the principles of programmed instruction;
- explain the objectives of programmed instruction;
- identify the stages of programmed instruction;
- describe the types of programmed instruction;
- analyze the merits and demerits of programmed instruction.

11.2 INTRODUCTION

Programmed instruction is one of the approaches that has gained great acceptance in recent years in education. It is a distinct strategy of

instruction based on the principles of learning defined by the behavioristic school of psychology as expounded by Skinner. These principles emphasize the need to specify the terminal behavior to be developed in the learner and then design the instructional process so as to maximize the rate of acquisition and maintenance of terminal behavior. This is achieved by the application of the principles of active responding, reinforcement, gradual and successive progression and empirical validation. The programmed instruction is based on the theory of operant conditioning.

The term Programmed Instruction has been coined from principles of operant learning or conditioning developed at the psychological laboratories on the basis of experimental studies conducted on animals by B. F. Skinner of Harvard University. This concept was used to development of self-learning material or programmed learning and teaching machines. B. F. Skinner and his companions had first started 'programmed learning' in 1943.

11.3 MEANING OF PROGRAMMED INSTRUCTION

Programmed instruction or programmed learning is one of the important innovations in the teaching learning process. It is a carefully specified, systematically planned, empirically established, skillfully arranged and effectively controlled self-instructional technique to provide individualized instruction or learning experiences to the learner. The subject matter or learning experience is logically sequenced into small segments. The learning experience is self-corrected. It is an application of the principles of behavioral sciences and technology in the field of education.

11.4 DEFINITIONS OF PROGRAMMED INSTRUCTION

Some definitions of programmed instruction are as follows -

- "Programmed learning is a step by step, self-instructional programme, systematic, aimed to ensure the learning of stated behavior" ------- Edgar Dale.

- "A Programmed instruction is a method of self-instruction that enlists machines or specially prepared books to teach information" ------- Chris Jordan.
- "Programmed instruction is the process of arranging the material to be learned into a series of sequential steps that is from known to unknown" ------- Smith and Moore
- "Programmed learning is a method of designing a reproducible sequence of instructional events to produce a measurable and consistent effect on behavior of each and every acceptable students" ------- Susan Markle.
- "Programmed learning refers to the arrangement of instructional material in progressive sequences" -------- Harold W. Bernard.
- "Programmed instruction is a planned sequence of experiences, leading to proficiency, in terms of stimulus - response relationship that have proven to be effective" ------- J. E. Espich and Bill Williams.
- "An instructional programme is a vehicle which generates an essentially reproducible sequence of instructional events and accepts responsibility for efficiently accomplishing a specified change from a given range of initial competencies or behavioral tendencies" ------- Arthur A. Luonsdaine.

From the above definitions, it can be summed up that programmed instruction is a method of presenting new subject matter to students through a graded sequence of controlled steps with corresponding activities. Students work through the programmed material at their own speed independently and assess their own comprehension after each step through exam questions or filling in a diagram. This method consists of a network of tests and statements which direct the student accordingly depending on their pattern of errors.

Programmed instruction refers to two main methods of learning. The first was developed by Norman Crowder, where the instructor includes multiple choice test questions within the text and provides feedback for each of the non-correct alternative options when a student chooses them. The second was developed by B.F. Skinner and includes a schedule of reinforcement for activities placed in a specific, continuous order.

11.5 NATURE OF PROGRAMMED INSTRUCTION

The nature of programmed instruction can be explained below -

- Programmed instruction is a method of individualized instruction.
- In this technique instructional materials are logically sequenced and broken into suitable small steps of the subject matter called 'frames'.
- In actual operation the beginning is made by presenting a form. The learner is required to read or listen to then respond actively.
- Programmed instruction system has an adequate provision for feedback.
- In a programmed learning situation, the learner progresses at his own pace.
- Here, the interaction between the learner and the learning material or programme is very important.
- Programmed instruction provides self-spacing to the learners.
- Programmed instruction is based on the behavioristic principles of psychology.
- It calls for the overt responses of the learner which can be readily be observed, measured and effectively controlled.
- In programmed instruction objectives are defined clearly in operational terms.
- Frequent response is required of the student.
- In a programmed material continuous evaluation is possible by the record of student's response.
- The assumption about the learner is clearly stated in the programmed learning materials.
- The content and sequence of the frames are subjected to actual try out with students and are revised on the basis of data gathered by the programmer i.e. "diagnostic feature".
- The objectives underlying programming are defined explicitly and in operational terms so that the terminal behavior is made observable and measurable.

- The strategy provides sufficient situation for teaching the student to make discriminations among range of possibilities and to reduce generalizations.
- There is immediate confirmation of right answer or correction of wrong answers given by the learner's i. e. "self-correcting feature".
- Programmed instruction enhances the capacity of the learner to discriminate or to generalize by frequent application and thus offers the learner an interesting challenging project.
- In programmed instruction a learner moves in every specific way as opposed to traditional procedures of teaching where the learner moves in very general way.
- Programmed instruction takes care of the fact that there are even differences in the rate at which an individual learner learns various kinds of subject matter.

11.6 PRINCIPLES OF PROGRAMMED INSTRUCTION

Programmed instruction is a relatively new strategy in teaching learning process, which has outweighed the traditional teaching techniques that have become obsolete in the technologically developed societies. Five basic principles of programming have basically emerged from the experimental studies conducted by Prof. Skinner. They are given below -

- **Principle of small steps:** This principle is based on the basic assumptions that one learns better, if the content matter is presented to him/her in suitable small steps. According to this principle a programmer while preparing a program should try to arrange the subjects matter properly into a sequence, meaningful segments of reformation called 'Frames'. These segments should be presented one at a time before the learner for responding.
- **Principle of active responding:** This principle rests on the assumption that a learner learns better by being active. In programmed instruction the learner may remain active. A good program should actively involve the learner in the learning process.

It should be formed that the learner may not get difficulty in moving from one frame to another and to remain meaningfully busy and active by responding to the frames and then acquiring the knowledge in a properly sequenced way.

- **Principle of immediate reinforcement:** The psychological phenomenon of reinforcement is the basis of this principle. One learns better when one is motivated to learn by receiving information of the result just immediately after responding. Therefore, in a good program, appropriate consideration is always made on immediate reinforcement is always made on him/her by informing immediately about the correctness of his/her response.
- **Principle of self-pacing:** The programmed instruction is a technique of individualized instruction. It is based on basic assumption that learning can take place better if an individual is allowed to learn at his own pace. The programming of the material should be done on the view of the principle of individual differences and the learner should be able to respond and move from one frame to another according to his/her own speed of learning.
- **Principle of student evaluation:** The continuous evaluation of the student to the learning process leads to better teaching and learning. In the programmed instruction the learner has to leave the record of his responses because he is required to write the response for each frame on a response sheet. This detailed record helps in receiving the program.

11.7 OBJECTIVES OF PROGRAMMED INSTRUCTION

Following are the objectives of programmed instruction -

- To help the students for learning by doing.
- To provide the situation to learn at his/her own speed.
- To help the student to learn without the presence of teacher.
- To present the mater in a logical manner.
- To study himself.

- To evaluate himself.
- To compare his/her answer with the key.

11.8 STAGES OF PROGRAMMED INSTRUCTION

The stages of programmed instruction are -

- **Preparation:** This is the first stage in the development of program. It includes selection of the topic, writing assumptions about learners, defining objectives in behavioral terms, writing the entry behavior of the learner, developing specific outline of the content, preparing a criteria test.
- **Construction or writing of the programme:** (a) It includes writing drafts, frames in a sequence i.e. from simple to complex, (b) editing the drafts frames by a team of experts usually comprising a subject matter expert, a skilled writer to a programmer.
- **Try out revision:** (a) It includes a trying out the programme on a few individual learners and finding out their reactions and making necessary changes in the light of reactions, (b) trying out the problem on a group of learners and making necessary changes on the basis of their reactions, (c) trying out the problem in the field.
- **Evaluation:** This implies findings the success or the failure after implementing a problem.

11.9 TYPES OF PROGRAMMED INSTRUCTION

Following are the types/styles of programming -

- Linear Programming.
- Branching Programming.
- Mathetics.
- Computer Assisted Instruction

They are explained below -

- **Linear or Extrinsic Programming:** B.F. Skinner is the originator of linear programming. It is also called a single track program or extrinsic programming. According to Skinner, a creature, a bird, or

a human being can be lead to a desired behavior by means of a carefully constructed program consisting of small steps leading logically through the subject matter from topic to topic, provide each step is reinforced by some kind of favorable experience and rewards. In the linear program the learner's responses are controlled externally by the programmer sitting at a distance place. Hence, linear programming is also termed as Extrinsic Programming. Here, all the learners have to proceed through the same frames or in the same order. It is based on theory of operant conditioning. It tells that "A Certain direction can be given to human behavior", for this purpose activities is needed to divide in small parts and make their analysis.

Characteristics of Linear Programming

Following are the characteristics of linear programming -

- **Linear arrangement:** Linear programming represents a linear arrangement. Here, all the learners have to proceed through the same frames in the same order.
- **Responses are controlled:** In linear programming the whole instructional process is well controlled by the programmer. Constructed response is an important characteristic of linear programming. There is no freedom of choice to answer in their own way.
- **Small step:** In this programme the learning material is presented into a series of small steps called frames. Each frame carries a single idea, example or rule.
- **Response is emphasized:** Here, emphasis is laid on the response and the learner must respond to each and every frame for learning.
- **Immediate feedback:** In this programme, feedback or reinforcement is quite immediate. Knowledge of result acts as reinforcement and maintains motivation.
- **Prompting:** Prompts or clues are given in the earlier frames in order to minimize probability errors and are generally withdrawn towards the end of the programme.

- **Active participation:** This programme requires active participation from the part of the learner so that it can move smoothly.
- **Self-pacing:** The learner can learn according to his own speed so that the programme moves differently but steadily and that leads the learner from initial to terminal behaviour.
- **Record student's response:** It provides not only stimulus but also the record of the student's response.
- **Proceeds step by step:** In this programme all the small units are presented in a logical order, so that the learner proceeds step by step without missing anything and without committing any mistake.

Principles of Linear Programming

Linear programming is based on five fundamental principles -

- Principles of small step.
- Principle of active responding.
- Principle of immediate confirmation.
- Principle of self pacing.
- Principle of student testing.

Advantages of Linear Programming

Following are the advantages of linear programming -

- Linear programming highlights the bottleneck in the production process.
- It provides better tools for meeting the changing conditions.
- It improves the quality of the decisions.
- It helps in attaining optimum use of productive factors.

Limitations of Linear Programming

Following are the limitations of linear programming -

- **Teacher-pupil contact:** In this programme, the teacher-pupil contact for the development of human personality and relationship was completely lost.
- **Limited topics:** Linear programming is confined to the limited topics and subjects. It is difficult to convert all topics and subjects to programmed materials.

- **Convergent thinking:** Linear programming does not permit differentiation amongst answers; therefore it is unable to develop discriminating power of the learners.
- **Time-consuming:** Programming is an enervating and time-consuming process. To follow the basic procedures of organizing and then writing a programme is a tedious work.
- **Branching or Intrinsic Programming:** The second most popular and conventional style of developing programming is branching programming. Branching or intrinsic program was developed by Norman, and hence this is known as the Crowderian style. It is also known as branching or intrinsic style of programming. It has been defined as "a programme, which adapts to the needs of the students without the medium of extrinsic device such as computer". This style of programming is called intrinsic because here the learner himself makes the decision to adapt the instruction to his needs according to his background of the subject. The underlying principle of branching is that different students need different instructional materials and that the student can learn from his own errors. This principle is quite different from linear programming in which all the students uniformly follow the same sequence of frames irrespective of their background in the subject.

According to Norman, an American technician, branching or intrinsic programming is one which adapts to the needs of the learner without any extrinsic device such as computer. It is not controlled extrinsically by the programmer. This type of program involves multiple choice response patterns. The learner is required to select the right answer out of several responses prevented to him/her. It is based on configuration theory of learning. It is a problem solving approach. It is stimulus centered approach of learning.

Principles of Branching Programming

Branching programming is based on three basic principles -

- Principle of exposition
- Principle of diagnosis

- Principle of remediation.

Assumption of Branching Programming

Assumptions behind this programming are -

- Student learns better if he/she is exposed to whole situation or content.
- Student errors help in diagnosis.
- Student learns better if remediation is provided side by side.
- Student learns better in democratic environment.

Limitations of Branching or Intrinsic Style

Limitations of branching programming are -

- There is every possibility that the learner may guess the correct response without understanding the subject matter of the frame.
- Infinite branching cannot be provided. It cannot cater to the needs of all individuals because it is very difficult to find out the total number of branches to every individual.
- The cost of preparation is very high. Audio-visual equipment is very costly. Programmes are the products of a programmer's imagination and it is he who decides diagnostic questions and level of content. The diagnostic questions may or may not suit the needs of individual learners.
- It is very difficult to ask questions on the whole matter of a frame because frames are too large. Sometimes important subject matter may be left out.
- In a branching programme, through the process of elimination, all students may eventually get through the material. There is no way of knowing, by merely looking at the programme, whether the student has comprehended the material; the fact that he has learned everything the programme is intended to teach.
- This technique does not shape the behaviour of the student as to the way a programme should.
- It does not consider learning process whether learning is taking place or not. Main emphasis is on diagnosing the weakness of learners and providing remedy to them.

- There is no sequencing of pages. Student finds it difficult to follow the steps. He does not find it exciting or motivating, therefore he does not want to go through these pages.
- More emphasis on remediation rather than teaching. Hence, it is only a tutorial approach.
- **Mathetics Programming:** Mathetics originally comes from the Greek word 'Mathein' which means to learn. Thomas A. Gilbert is the originator of the concept mathetics. According to him, mathetics is the systematic application of reinforcement theory to the analysis and construction of complex behaviour usually known as subject matter mastery, knowledge and skills. Mathetics if applied diligently produces materials that exit the efficiency of lessons produced by any known methods. It is based on connectivist theory of learning. It is a reverse chaining approach. It is based on Principle of Chaining, Discrimination and Generalization.

There are two distinctive types of programming techniques. One technique is the programming of subject material and the other is the programming of behaviour. Both techniques are distinct from each other in their areas of emphasis. Mathetics come under the second type of programming technique, which emphasizes the realization of objectives through performance.

Advantages of Mathetics Programming

Following are the advantages of mathetics programming -

- Mathetics programming is a task oriented programme.
- Results can be linked to concrete goals which we intend to achieve through a mathetics programme.
- Its stress on learner success at 90/90 criterion level of mastery motivates the learner.
- It utilizes the principal of backward chaining.
- It is relevant, significant, meaningful and valid in the eyes of the learner and programmer.

Limitations of Mathetics Programming

Following are the limitations of mathetics programming -

- Main emphasis is on mastery of the content rather than changes in behaviour of the learner.
- Retrogressive chaining of stimuli if not effective for terminal behaviour.
- It is very difficult to develop retrogressive learning package.
- It is very technical in nature and such as demands a lot of skill, training and labour on the part of the programmer.
- It is not suitable for learning the material of all subjects.
- Mathetics cannot be used for factual content.
- Mathetics is not based on any sound learning theory.

Assumptions of Mathetics Programming

Mathetics programming is based on following assumptions -

- Chaining of responses helps in learning to reach up to mastery level.
- Reverse chaining of stimuli helps in learning, i.e. from whole to part, from complex to simple.
- Completion of task provides motivation to students.

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

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

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

- **Computer Assisted Instruction or Learner Controlled Instruction:** Computer is the most important gift of science and technology. It has done miracles in almost all works of life. Today

there is no aspect of our life which has remains untouched with the use and application of computers. Computer is also used in the field of education. Instructional works carried out with the help of computers is generally known as Computer Assisted Instruction or CAI in brief.

Computer-assisted instruction is a natural outgrowth of the application of the principles of programmed learning. The main objective of programmed learning is to provide individualized instruction to meet the special needs of certain individual learners. To accomplish this objective, it needs an efficient and flexible device that can store a massive amount of organized information and use a selected portion to meet the needs of individual learners. The computer is such a device, which can cater to the needs of individual learners by storing heaps of information. It can process the information suited to the needs of individual learners. It can meet a large variety of educational needs, which range widely with respect to educational levels, subject matter, style of instruction and level of learning from simple drill to problem solving.

In short, we can say that computer assisted instruction can be used as an important and effective tool in the teaching of various subjects. The basic principle to all forms of programming is to create a coherent body of knowledge based on careful analysis of the objectives for a particular set of students and gives the student a chance to participate actively in the process of learning, allowing him to test himself without any aid from anyone and to know where he stands.

Importance of Computer Assisted Instruction (CAI) in the Field of Education

- CAI can be used in providing sufficient drill and practice.
- CAI can develop problem solving ability of the learners.
- It can also develop creativity of the students.
- It can supplement laboratory and other practical work.
- CAI can provide opportunity for improving self-learning.
- It can provide valuable help in improving language skills.

- It can provide valuable teaching aid for instruction.
- CAI can help in the various areas and issues related to the teaching-learning and school management.
- It can be used for educational research purposes.
- It can be used in evaluation purposes.
- It can act as the best tutor.
- It also helps in the video conferencing classes.
- It helps in power point presentation.

Difficulties of Computer Assisted Instruction (CAI)

- CAI is very expensive in the field of education.
- It has no self-thinking capacity.
- Computer is an electronic device; there is a potential danger either to damage machine or damaged by the children.
- The children are dependent only on computers.
- CAI is a sort of mechanical approach to education.

These are actually the ways and means of providing instructions or not the basic format of the programming.



CHECK YOUR PROGRESS

Q 1: What is programmed instruction?

.....

Q 2: Give one definition of programmed instruction?

.....

Q 3: Write one characteristic of programmed instruction?

.....

Q 4: Write one principle of programmed instruction?

.....

Q 5: Write one objective of programmed instruction?

.....

Q 6: Why linear programming is called extrinsic programming?

.....

Q 7: Mention one advantage of programmed instruction?

.....

Q8: Mention one disadvantage of programmed instruction?

.....

11.10 MERITS OF PROGRAMMED INSTRUCTION

Following are the merits of this teaching strategy -

- A well programmed instruction is a great trust in the direction of individualized instruction.
- It permits individual learner to progress at his own speed.
- Programmed instruction is more successful in critical sagacity (discernment) of the logic of various subjects and inspiring the students to creative thinking and judgment.
- Good teachers are freed from the humdrum of routine class-roomactivity and they are in a position to devote their time to morecreative activities.
- Some educationists fear that the programmed instruction will deteriorate the quality of instruction. On the other hand, the use of it has improved the quality of education in general.
- The use of programmed instruction has bought a revolution in the social setting of the class-room. Many emotional and social problems have been eliminated and problems of discipline have been automatically solved.
- Programmed instruction is a great thrust in the direction of individualized instruction. A well organized programmed instructional device is tailored to cater to the needs of individual students of the class.
- It helps the teacher to diagnose the problems of the individual learner.
- By presenting the material in small segments of information i. e. frame it makes the learning as an interesting game in which the learner is challenged by his own capabilities.

- The main emphasis is on individual differences and students' involvement.
- There is not fixed time interval for learning. Students may learn at their own pace.
- Learning by doing maxim of teaching is followed to involve learners in the learning process.
- Students are exposed only to correct responses, therefore, possibility to commit errors in reduced.
- Immediate confirmation of the results provides reinforcement to the learners and encourages the learners to proceed further. Feedback is provided to wrong answers, so that learner is able to develop mastery over the content.
- It may be less complicated to keep materials in current programmed instruction unit than it is to update in a textbook.
- Material can be exchanged from country to country and from state to state, giving flexibility and variety to extension offering.
- Programmed Materials can be prepared for and adapted to fit almost any local situation related to nationality, economic or cultural variations in a community.
- The main emphasis is on individual differences and students' involvement. Learners will work individually.
- There is not fixed time interval for learning. Students may learn at their own pace. Students can proceed at their own pace and at time convenient to them. A slow learner is not embarrassed.
- Those who setup programmed instruction units may be motivated to plan their efforts more deliberately and more thoroughly than with traditional teaching.

11.11 DEMERITS OF PROGRAMMED INSTRUCTION

Programmed instruction has demerits too, among them are -

- The programmed instructional materials are very costly only rich nations can afford it.

- Programmed materials have been severely criticized as a threat for the replacement of teachers.
- Programmed instruction does not eliminate competition or grades as often claimed.
- Mere manipulation of machine is not rewarding to children as Skinner seems to think. Once the novelty wears and if, at the start, too many errors appear the pupils loses interest and motivation. Later reinforcements often do not accelerate learning.
- Programmed instruction restricts the learner's freedom of choice resulting in cramping of his imagination and initiative.
- Operant conditioning is found successful only with some pupils, in some cases and not in all. Programmed instruction ignores or makes inadequate provisions for variables like cognitive variables, personality variables and motivational variables.
- The teacher- pupil contact which is so vital for development of human personality and relationship is completely lost.
- In language learning, speech is equally important as development of reading and comprehension skills. But there is no scope for providing this experience.
- It is very difficult to develop an instructional programme.
- Due to tight schedule of time table, students cannot be left to learn at their own pace. It would be very difficult to learn the content the subject matter in a limited period of time.
- There is no chance for students' creativity, their responses are highly structured.
- Development of programme is not economical in terms of cost and time.
- In absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises.
- It cannot be applied at primary level of education or at higher education.
- In absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises.

- Motivation is necessary for students, whether they are staff members or layman, to complete units of programmed instruction. It may be that job promotion in their own organization would be sufficient enticement. Possibly an item in the individual personnel record would motivate him to complete a unit.
- Only cognitive objectives can be achieved. There is no chance for students' creativity, their responses are highly structured.
- Programmed Instruction done on an individual basis at student's home or offices would likely have to be limited to the linear type. While this could be effective, it may not have the potential that more sophisticated computers would have.
- The extension teacher must keep in touch with their students working on units and let them know he is interested in progress and keeping in touch. This may be difficult to do in some cases, like in case of high rate of competition.
- The preparation of programmed instruction material is time demanding, many hours are usually required to produce a unit. Due to tight schedule of time table, students cannot be left to learn at their own pace. It would be very difficult to learn the content the subject matter in a limited period of time.
- The problem of teacher motivation, one of the human factors in programmed learning, must be given attention if this method is to succeed.
- The technique may be new to the particular students and they may not complete units satisfactorily because they don't adequately understand programmed instruction.



ACTIVITY 11.1

Give some suggestions for programmed instruction.



11.12 LET US SUM UP

- Programmed instruction or programmed learning is one of the important innovations in the teaching learning process. It is an application of the principles of behavioural sciences and technology in the field of education.
- Nature of programmed instruction - it is a method of individualized instruction, here, materials are logically sequenced and broken into suitable small steps of the subject matter called 'frames', it has an adequate provision for feedback, the learner progresses at his own pace, the interaction between the learner and the learning material, based on the behaviouristic principles of psychology, continuous evaluation is possible by the record of student's response, etc.
- Principles of programmed instruction are - principle of small steps, principle of active responding, principle of immediate reinforcement, principle of self pacing, principle of student evaluation.
- Objectives of programmed instruction are - to help the students for learning by doing, to provide the situation to learn at his/her own speed, to help the student to learn without the presence of teacher, to present the mater in a logical manner, to study himself, to evaluate himself, to compare his/her answer with the key.
- The stages of programmed instruction are - preparation, construction or writing of the programme, try out revision and evaluation.
- The types/styles of programming are - Linear Programming, Branching Programming Mathetics and Computer Assisted Instruction.
- Merits of programmed instruction are - a well programmed instruction is a great trust in the direction of individualized instruction, it permits individual learner to progress at his own speed, the use of programmed instruction has bought a revolution in the social setting of the class-room, programmed instruction is a great thrust in the direction of individualized instruction, it helps the teacher to diagnose the problems of the individual learner, the main emphasis is on

individual differences and students' involvement, there is not fixed time interval for learning, learning by doing maxim of teaching is followed to involve learners in the learning process, feedback is provided to wrong answers, so that learner is able to develop mastery over the content, material can be exchanged from country to country and from state to state, giving flexibility and variety to extension offering, etc.

- Programmed instruction has demerits too, among them are - programmed instructional materials are very costly only rich nations can afford it, materials have been severely criticized as a threat for the replacement of teachers, restricts the learner's freedom of choice resulting in cramping of his imagination and initiative, the teacher-pupil contact which is so vital for development of human personality and relationship is completely lost, in language learning, speech is equally important as development of reading and comprehension skills, but there is no scope for providing this experience, it is very difficult to develop an instructional programme, due to tight schedule of time table, students cannot be left to learn at their own pace, it would be very difficult to learn the content the subject matter in a limited period of time, there is no chance for students' creativity, their responses are highly structured, development of programme is not economical in terms of cost and time, in absence of the teacher, students may spoil the disciplinary tone of the class, or they will be helpless when any problem arises, it cannot be applied at primary level of education or at higher education, only cognitive objectives can be achieved, the technique may be new to the particular students and they may not complete units satisfactorily because they don't adequately understand programmed instruction.



11.13 FURTHER READING

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11.14 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Programmed instruction is an application of the principles of behavioral sciences and technology in the field of education.

Ans to Q No 2: According to Edgar Dale, "Programmed learning is a step by step, self-instructional programme, systematic, aimed to ensure the learning of stated behavior".

Ans to Q No 3: Programmed instruction is a method of individualized instruction.

Ans to Q No 4: Principle of Immediate reinforcement.

Ans to Q No 5: To help the students for learning by doing.

Ans to Q No 6: In the linear program the learner's responses are controlled externally by the programmer sitting at a distance place. Hence, linear programming is also termed as extrinsic programming.

Ans to Q No 7: Programmed instruction permits individual learner to progress at his own speed.

Ans to Q No 8: Development of programme is not economical in terms of cost and time.

11.15 POSSIBLE QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: What are the characteristics of programmed instruction?

Q 2: What are the objectives of programmed instruction?

Q 3: What are the styles of programmed instruction?

Q 4: Differentiate between linear and branching programming.

Long Questions. (Answer each question in around 300-500 words)

Q 1: Write briefly about the stages of programmed instruction.

Q 2: Discuss the importance of computer assisted instruction in the field of education.

Q 3: Discuss the merits and demerits of programmed instruction.

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UNIT 12 : INTERNET

UNIT STRUCTURE

12.1 Learning Objectives

12.2 Introduction

12.3 What is Internet?

12.4 Major Constituent Characteristics of Internet

12.5 Uses of Internet in Modern Education and Communication

12.6 Disadvantages of the Internet

12.7 Let Us Sum Up

12.8 Further Reading

12.9 Answer to Check Your Progress

12.10 Possible Questions

12.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- learn the basic concept of internet ;
- discuss different major constituent characteristics of internet ;
- explain the uses of internet in modern education and communication;
- enumerate the disadvantages of the internet.

12.2 INTRODUCTION

As we know that internet plays an important role everywhere at present. In the field of education also it has its very vital role. It is the most useful technology of modern times which helps us personal as well as professional lives too. For educational purposes, it is widely used to gather information and to do research or add to the knowledge of various subjects. Popular search engines like google, yahoo are the topmost choice of people as such engines provides vast amount of information in just a few seconds. It contains a wealth of knowledge that can be searched anytime and anywhere. In one sentence, it has introduced the improvement in technology, communication and online entertainment. On considering the significance

of internet, this unit has brought its different aspects in front of you for your better understanding and further practical applications. In this unit, first of all, you will able to learn about the basic concept of internet. You will also study the different characteristics of internet and its uses in modern education as well as communications. Also from the last part of this unit, you will able to analyze the disadvantages of using internet.

12.3 WHAT IS INTERNET?

Internet is the connector of all the computers around the world through a network. In can be defined as the global interconnected network of computer networks. It should be mentioned here that either two or more computers or mobile and such any other electronic devices are connected together in such a way that anyone can communicate by sending messages or video conferences or audio conferences to each other, then they form a network.

Internet is the latest wonder in the modern world of technological communication. It may be said as a future step to development of computer technology. The U.S. Department of Defence in the 1960 had undertaken the work of experimentation on computer network. They wanted to create a computer network that may work even if the nuclear took place due to hit by enemy nuclear missiles in the communication system. They were successful in their attempt. They have developed an agency called Advanced Research Project Agency (ARPA) for future study and research in this line. The present form of World Wide Internet Service was its origin to this achievement.

Since 1981 computers have increased dramatically in speed. Gem Burners Lee, research scholar in Switzerland had developed the World Wide Web (WWW) to make the information on the internet easier to read and understand. Internet is yet another bold step ahead of computer science to future progress of the modern communication technology.

Internet may be defined as the world's largest network system. So, it is said to be the networks of networks. It provides the fastest, easiest and

cheaper means of information communication on the global basis. On the technological level, it is millions of computers that are interconnected through worldwide telecommunication protocols. On the human level internet may be said as the people who make use of those computers, and share information among themselves. The internet has the reach content of information in the form of text, pictures, sounds and video clips. It should be noted that the concept internet has emerged in human mind not because some commonly agreed upon ideological principles but simply because of the sense of freedom and functional anarchy in mind of modern man. Nobody owes the internet nor censor authority is there to regulate it and no country has the power to bring it under control. The system itself enjoys unimaginable freedom in its functioning, although computer security rests on confidentiality and integrity maintained by users.



CHECK YOUR PROGRESS

Q 1: Who did undertake the work of experimentation on computer network?

.....

Q 2: Who developed the World Wide Web (WWW) to make the information on the internet easier to read and understand?

.....

Q 3: Why is internet said to be the networks of networks?

.....

12.4 MAJOR CONSTITUENT CHARACTERSTICS OF INTERNET

The true nature and its functions may be summarized with the following points.

- Internet can be said as the network of networks. It is the network of millions of computers working in the world.

- Nobody owns the internet, nor did any country have the authority to control it.
- Contents of communication through internet are varied and extensive that covers a wide ranging of subjects for the users.
- As internet is easily accessible to people, there is every possibility of it being misused.
- In order to safeguard internet from being misused, certain communication protocols for internet security have been designed.
- Internet communication recognizes no political boundaries. It has been globalised in its functions.
- It was invented; it has evolved over three decades out of desire of people of the world.



CHECK YOUR PROGRESS

Q 4: Do you think that internet has every possibility of it being misused?

.....

Q 5: Write three characteristics of internet.

.....

12.5 USES OF INTERNET IN MODERN EDUCATION AND COMMUNICATION

Explosion of human knowledge, information and education through the internet is undoubtedly the greatest and the most exciting contribution of modern communication technology of mankind. It has provided wider spectrum of learning opportunity more specifically through the World Wide Web (WWW). A variety of areas of education and information have been covered by the internet, so far and in the 21st century there are further promises and possibilities to cover certain more sensitive arrears. In this regard our attention may be drawn to the following vital areas.

- **E-mail:** People naturally want to communicate important information with the near and dear ones in the fastest way possible. Electronic mail connected with the internet is the means to achieve this objective easily. In order to send and receive the message both the users must have an E-mail address that usually rests in the form of user's domain.
- **Collection and Publication of Information:** Internet is the fastest way to collect and publish the news and information from any part of the globe. A modern man needs to be well informed of the latest and up to date news and information in order to serve his personal need and make immediate reaction to them. One can collect such information immediately and the new agencies can publish them in the newspapers overnight make available early in the morning through internet.
- **Business Purposes:** Internet is of great help to the business world today. The business and big business houses are taking the first advantage of this media in making advertisement and publicities of their industrial goods in the world market. Customers of those goods can also easily come to know about the quality products and use ability of them sitting in their own homes. Business discussion for promotion of international trade and commerce has also been greatly helped by the internet.
- **Data collection for Research:** Undertaking research work by the scholars on certain subjects has been very much simplified by the internet. Renowned scholars of the world over have made their original contribution in the field of modern science and technology. The new researchers need to know them for their own creation at the easiest and the earliest convenience. This has made possible by the world internet.
- **Inter - University Communication:** Inter services can practically help the universities in the different parts of the world to maintain their universal characteristics. Those universities must maintain intellectual cooperation and co-ordination in their exchange of

knowledge and in sharing experiences. Teachers and students of them are now greatly helped by use of internet services, in maintaining such communication. It is a big step to globalization of education.

- **Distance Learning Programme:** The concept of distance learning through correspondence with the educational authority by the learner has been made a reality through the internet. The different open universities have been able to cater to the needs of higher education to people through this powerful communication media. Scope of non-formal education has been widened quite un-believably through the use of it.
- **Video- Conferencing:** It is a technique of getting both audio and video communication facility at a time through the internet. It may be applied for effective learning by making contact with the expert person in a certain subject who stays at distance places. It helps in economizing time, money and effort in getting valuable knowledge and information. Instantly which otherwise is not possible to be had from distance.
- **Recreation and Entertainment:** The need of recreation and entertainment for the modern men has been greatly served by the internet. It provides leisure time education through songs, dances feature films and serials etc. presented by the renowned artist. Famous international games and sports held on any part of the world are being brought to every home by the internet services. The common people use to live with those entertainments provided by the media that have the far reaching effect on their keeping of mental health and hygiene.

Besides above discussion, regarding the benefits of internet in the field of education, the following points can also be added for our further knowledge.

- **Cost Effective and Affordable Education:** High cost is one of the largest barriers to education. The Internet improves the quality of education, which is said to be one of the pillars of sustainable

development of a nation. It provides education through Videos (like YouTube tutorial videos) and web tutorials that are affordable to everyone as well as cost-effective.

- **Student - Teacher and Peer Interaction:** The internet has allowed students to be in constant touch with their teachers or with other fellow classmates with the help of social media, messaging apps and chat forums. Parents can interact or communicate with teachers and school authorities about their kid's performance in the school. Interaction with the likeminded people on forums can help students to explore new ideas and enrich their knowledge too.
- **Effective Teaching and Learning Tool:** The Internet has become an effective teaching as well as a learning tool. Teachers can use it as a teaching tool by posting their teaching materials (notes and videos) on school website or forum. The learning process becomes interesting and diverse with the use of tutorial videos and notes. Teachers can teach with the use of animation, PowerPoint slides, and images to capture the students' attention.
- **Easy Access to Quality Education:** Students can easily access quality education materials like tutorial videos on YouTube for free or pay fees online for more quality study materials. Teachers can also make use of the internet by proving the students with extra study material and resources such as interactive lessons, educational quiz as well as tutorials. Teachers can record their lectures and provide it to the students for revisions which is better than reading from notes.
- **Interaction with Digital Media:** Regular use of digital media is one of the most basic parts of our lives. Digital bulletin boards save paper, allow displaying of videos and audios to attract the attention of students. Nowadays, there are many paid sites which provide education resources which are rich in quality and easily understandable to masses.

- **Keeping updated with Latest Information:** The biggest advantage of internet is offering information. There is a huge amount of information available for every subject. It keeps us up to date with the latest information regarding the subjects in which we are interested.
- **Learning with Multimedia:** It helps the students with the learning process as it helps to simplify the knowledge. Also, it helps to visualize what is being taught by the teachers in school.

12.6 DISADVANTAGES OF INTERNET

Nothing in the world is perfect, everything and everyone has its own pros and cons. Similarly, contrary to popular belief the Internet isn't just full of advantages. There exist many disadvantages that many people still aren't aware of or refuse to talk about. The disadvantages of internet have been discussing below.

- **Cyber Bullying:** Cyber bullying is a serious crime that is usually ignored by most, due to the simple fact that it is "virtual" and not physical. But little do people know it almost has the same consequences as physical bullying, as it is the most common cause linked to depression, leading to suicide. Everyone has a Smartphone these days that allow them to stay connected to the Internet all the time, which makes it very easy to be exposed to Cyber Bullying. Here are some ways it can take form in:
  - Defamation
  - Discrimination
  - Manipulation
  - Abusive language

  Cyber Bullying usually takes place on social network platforms such as Face book, Twitter, Instagram, Ask FM, YouTube etc. where one would easily be able find people who won't miss a chance to bully someone.
- **Being exposed to hackers, viruses & identity theft:** As not everyone in the world is technical, it can be easy for hackers to

hack a non-technical person without him or her noticing at all. Internet is a very risky job and may sometime result in some mis-happenings where hackers can manipulate someone into downloading a fishy file and gain access to all their private data. One of the most common hacking that is done is on Face book or other social networks, to gain access to personal data or conversations to learn more about the victim - with the ultimate desire to steal their identity.

- **Exposure to negative content on the Internet:** People may exploit themselves on the Internet intentionally or unintentionally by exposing themselves to negative content on the web, such as graphic image or video of someone getting killed or pornographic material. This can be a very big issue for parents especially, hence it's best to install a spying or a social media monitoring app on their device to make sure what they are doing at all times.
- **Health issues:** Too much of anything always has a side effect, where as in this case - sitting all day in front of the computer or using the mobile phone to access the Internet can cause a lot of health issues which include heart problems, obesity, skin problems, eye problem, back pain etc.
- **Distraction:** The biggest disadvantage of the Internet is that it's easy to get distracted from it and spend hours without realizing, which could've been utilized in a more productive way.
- **Addiction:** Addiction to the net is known to be the biggest factor contributing to the Disadvantages of the Internet. Once any one is connected to the Internet, he or she cannot disconnect himself or herself from the Internet. The individual is stuck to the world of media and endless information.
- **Less focus & tolerance:** According to a survey conducted, it is observed that many people who use Internet on regular basis tend to lose their focus and are generally less patient/tolerating. This is a disadvantage of the Internet that is mostly ignored, which in return can affect a person's personal and career life deeply.

- **Social Isolation:** Usage of the Internet, especially using many social media has been linked with depression & anxiety. People give less time to the people who are present near them physically and give more time on the Internet. Even though they may have 500 friends on Face book, they still feel lonely and depressed due to lack of physical contact.

The Internet is a boon to the people, which is used all over the world. Hence, it should be used for good purpose. It has had a great impact on imparting education to the children. If this is used in appropriate ways that meet children's development level, they can benefit and learn from the Internet.



CHECK YOUR PROGRESS

Q 6: Mention two points regarding internet is helpful for communication.

.....

Q 7: Write two forms of Cyber bullying.

.....

Q 8: How internet is helpful in keeping us up to dated?

.....



12.7 LET US SUM UP

- Internet is the connector of all the computers around the world through a network. In can be defined as the global interconnected network of computer networks.
- Internet is the latest wonder in the modern world of technological communication. It may be said as a future step to development of computer technology.
- The U.S. Department of Defense in the 1960 had undertaken the work of experimentation on computer network.

- Since 1981 computers have increased dramatically in speed. Gem Burners Lee, research scholar in Switzerland had developed the World Wide Web (WWW) to make the information on the internet easier to read and understand.
- Internet may be defined as the world's largest network system. So, it is said to be the networks of networks.
- Nobody owes the internet nor censor authority is there to regulate it and no country has the power to bring it under control. The system itself enjoys unimaginable freedom in its functioning, although computer security rests on confidentiality and integrity maintained by users.
- Contents of communication through internet are varied and extensive that covers a wide ranging of subjects for the users.
- As internet is easily accessible to people, there is every possibility of it being misused.
- In order to safeguard internet from being misused, certain communication protocols for internet security have been designed.
- Internet communication recognizes no political boundaries. It has been globalised in its functions.
- Explosion of human knowledge, information and education through the internet is undoubtedly the greatest and the most exciting contribution of modern communication technology of mankind.
- It has provided wider spectrum of learning opportunity more specifically through the World Wide Web (WWW).
- A variety of areas of education and information have been covered by the internet, so far and in the 21st century there are further promises and possibilities to cover certain more sensitive arrears.
- Internet is the fastest way to collect and publish the news and information from any part of the globe.
- Undertaking research work by the scholars on certain subjects has been very much simplified by the internet.

- The concept of distance learning through correspondence with the educational authority by the learner has been made a reality through the internet.
- It is a technique of getting both audio and video communication facility at a time through the internet. It may be applied for effective learning by making contact with the expert person in a certain subject who stays at distance places.
- The need of recreation and entertainment for the modern men has been greatly served by the internet.
- The Internet has become an effective teaching as well as a learning tool. Teachers can use it as a teaching tool by posting their teaching materials (notes and videos) on school website or forum.
- There exist many disadvantages that many people still aren't aware of or refuse to talk about. These are like Cyber Bullying, Exposure to negative content on the Internet, Distraction, and Addiction etc.



12.8 FURTHER READING

1) Mangal S.K., Mangal Uma. (2016) Essentials of Educational Technology. Asoke K. Ghose, PHI Learning Private Limited, Delhi
2) Aragon, S. R. (2003). Creating social presence in online environments. New Directions for Adult and Continuing Education, 100, 57-68.
3) Ayers, E. L. (2004). The academic culture and the IT culture: Their effect on teaching and scholarship. EDUCAUSE, 39, 48-62.
4) Baker, J. (2003). Instructor immediacy increases student enjoyment, perception of learning. Online Classroom: Ideas for Effective Instruction, Sept. 2003.
5) Bates, Anthony, (1982). Roles and characteristics of television and some implications for distance learning. Distance Education, 3, 1, pp. 29-50.



12.9 ANSWER TO CHECK YOUR PROGRESS

Ans to Q No 1: The U.S. Department of Defense in the 1960 had undertaken the work of experimentation on computer network.

Ans to Q No 2: Gem Burners Lee, research scholar in Switzerland had developed the World Wide Web (WWW) to make the information on the internet easier to read and understand.

Ans to Q No 3: Internet may be defined as the world's largest network system. So, it is said to be the networks of networks.

Ans to Q No 4: As internet is easily accessible to people, there is every possibility of it being misused.

Ans to Q No 5: The characteristics of internet are-

- Internet can be said as the network of networks. It is the network of millions of computers working in the world.
- Nobody owns the internet, nor did any country have the authority to control it.
- Contents of communication through internet are varied and extensive that covers a wide ranging of subjects for the users.

Ans to Q No 5: Internet is very helpful in case of communication. For example,

- Internet is the fastest way to collect and publish the news and information from any part of the globe. A modern man needs to be well informed of the latest and up to date news and information in order to serve his personal need and make immediate reaction to them.
- Internet is of great help to the business world today. The business and big business houses are taking the first advantage of this media in making advertisement and publicities of their industrial goods in the world market.

Ans to Q No 6: Two forms of Cyber bullying are: Defamation and Discrimination.

Ans to Q No 7: The biggest advantage of internet is offering information. There is a huge amount of information available for every subject. It keeps us up to date with the latest information regarding the subjects in which we are interested.

12.10 POSSIBLE QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: Mention the constituent characteristics of internet.

Q 2: How much internet is helpful in distance learning programme?

Q 3: Easy access to quality education is possible through internet. How?

Q 4: What is meant by video conferencing?

Q 5: What is Cyber bullying?

Q 6: Do you think that excessive use of internet may lead us to social isolation?

Q 7: Exposure to negative content on the Internet may affect the individual. Is it true?

Q 8: Internet may have also negative impact on health. How?

Q 9: What are the different forms of cyber bullying?

Long Questions. (Answer each question in around 300-500 words)

Q 1: Explain the uses of internet in the field of education.

Q 2: Discus about the impact of internet in the field of communication.

Q 3: Discus the disadvantages of internet with examples.

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UNIT 13 : LANGUAGE LABORATORY

UNIT STRUCTURE

13.1 Learning Objectives

13.2 Introduction

13.3 Meaning of Language Laboratory

13.4 Definitions of Language Laboratory

13.5 Characteristics of Language Laboratory

13.6 Objectives of Language Laboratory

13.7 Kinds of Language Laboratory

13.8 Steps to Carry Out the Activities of the Language Laboratory

13.9 Advantages of Language Laboratory

13.10 Limitations of Language Laboratory

13.11 Let Us Sum Up

13.12 Further Reading

13.13 Answer to Check Your Progress

13.14 Possible Questions

13.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know the meaning and definitions of language laboratory;
- discuss the characteristics of language laboratory;
- identify the objectives of language laboratory;
- discuss the kinds of language laboratory;
- analyze the steps to carry out the activities of the language laboratory;
- enumerate the advantages of language laboratory;
- identify the disadvantages of language laboratory;
- explain the equipments or instruments of a language laboratory.

13.2 INTRODUCTION

Good communication skills are indispensable for the success of any professional. If one wants to reach out to people, he or she has to speak their language. The English language, in particular, has become essential in the lives of young people who aspire to advance their careers anywhere in the world. English language learning has therefore become a must for any Indian student today.

It is required of any learner to have a good command of the language for communication purposes, with clarity and accuracy being vital for effective and efficient communication. What help one to acquire such proficiency in a language are the process and the method of learning that language.

Language learning is quite different from learning any other subject. It is not limited to writing an examination paper and getting marks or award. The four skills: listening, speaking, reading, writing have to be put into practice since having the ability to communicate well is the central purpose in learning any language. Communication entails the student's capability to listen attentively to the exact meaning and to respond with appropriate words and with clear pronunciation.

We can, however, describe what language is, language is a medium of communication. Communication implies carrying of message or receiving of message. The importance of English is not because of its more users but what it is used for. In the present century English has gained a position. It is commonly used in many fields. English language makes the people to know what is happening around the world.

There are several components necessary to master a language. It is not just about being able to read and understand certain words. It also entails mastery of the spoken language. There are language learners who learn how to read and write fast. However, if they are asked to talk, they could barely pronounce the words right. This is true especially in learning the English language. This is the reason why language laboratories are essential.

The curriculum of the present educational system in India does not have a laboratory session for arts subjects. Only those who study science subjects have practical work, which is undertaken in a laboratory. Hence, a laboratory for language learning is something new to Indian students, whereas it is very common in Western countries to train children in the laboratory to enrich their language learning experiences.

In the current digital age, we are all connected regardless of the geographic distance. Advancement in technology has metaphorically brought the world into our living room in the form of TV or internet which allow us to watch events happening in other countries or talk to friends and family living in another continents via internet. As a result, we are exposed to different languages, cultures and traditions of people from all over the world. As we live in multilingual and multicultural world, language lab can greatly help students to learn language of their choice, as it will allow students to learn at their own pace. They can record and assess their performance to make sure that they are paying attention to all aspects of phonetics.

In today's world the basic but the most expensive skill required is to handle the English Language efficiently. It silently reveals the caliber of the individual in their profession which in turn contributes to career growth. Modern language labs are known by many names, digital language lab, multimedia language lab, language media center and multimedia learning center.

The language lab provides access to native-speakers via audio-video aids so that they learn correctly. Given large number of students pursue higher studies outside their home country; language lab would help them in studying the language of the country where they are planning to pursue their higher education. As strong communication skills are essential in almost all of the professional careers, language lab can help in acquiring this important skill.

13.3 MEANING OF LANGUAGE LABORATORY

A language laboratory is a classroom where students use devices to listen and speak languages. It is a classroom in which students learning a foreign language can practice sound and word patterns individually or under supervision with the aid of audio equipment, etc. An example of a language laboratory is a college space where students use headphones to listen and to learn Spanish.

A language laboratory is arranged to make foreign language learning more effective. Emphasis is on speaking and listening. Language lab is set in computer rooms.

The language laboratory plays an important role in the language learning process. As it is a technological aid for learning, it has a number of advanced facilities that can help a student to learn a language with proficiency to communicate. It has become inevitable in today's context but, at the same time, it poses certain challenges.

Laboratories in schools might only be associated with science subjects. This serves as their workplace to experiment on specific subjects. However, this is also necessary for language learning. This provides an avenue for the students to improve the way they pronounce the words and be corrected by the teacher whenever necessary. Generally laboratories were used in India for the science subjects. With technological advancement and exposure to western models of teaching and learning, there has been a spurt in the growth of language laboratories in colleges.

The language laboratory is an audio or audio-visual installation used as an aid in modern language teaching. They can be found, amongst other places, in schools, universities and academies. Perhaps the first lab was at the University of Grenoble. (Ruby,W.B. 2004). In the 1950s up until the 1990s, they were tape based systems using reel to reel or (latterly) cassette. Current installations are generally multimedia PCs. The original language labs are now very outdated. They allowed a teacher to listen to and manage student audio via a hard-wired analogue tape deck based systems with 'sound booths' in fixed locations.

The language laboratory is a very helpful tool for practicing and assessing one's speech in any language. It provides a facility which allows the student to listen to model pronunciation, repeat and record the same, listen to their performance and compare with the model, and do self-assessment. Since the language laboratory gives every learner of any language freedom to learn at their own pace, it is flexible and does not necessarily require a teacher all the time. At the same time, it is possible for teachers to provide assistance individually and collectively. The language laboratory allows every participant his or her privacy to speak and listen.

13.4 DEFINITIONS OF LANGUAGE LABORATORY

Following are the definitions of language laboratory -

- **According to American Heritage Dictionary 4, language laboratory is:** "A room designed for learning foreign languages and equipped with tape recorders, videocassette recorders, or computers connected to monitoring devices enabling the instructor to listen and speak to the students individually or as a group".
- **The Webster's New World College Dictionary definition of the language laboratory is:** "A classroom in which students learning a foreign language can practice sound and word patterns individually or under supervision with the aid of audio equipment, etc".
- **(Language Lab in Webster's New World College Dictionary), Cesar (2006) defined language laboratory as:** "…a teaching tool requiring the implementation of well-constructed tasks based on the students 'needs".
- **Beder (2008) in defining language laboratory stated:** "A language laboratory is a room in a school, college, training institute, university or academy that contains special equipment to help students learn foreign languages by listening to tapes or CDs, watching videos, recording themselves, etc".
- **Mambo (2004) affirmed that:** "Language laboratories are environments designed to enhance foreign language learners' skills.

Generally equipped with analog and digital hardware, and software (tape recorders, videocassette recorders, or computers), they provide practices in listening comprehension, speaking (listen and repeat), with the goal to reinforce the grammar, vocabulary and functions (grammatical structures) presented in class".

13.5 CHARACTERISTICS OF LANGUAGE LABORATORY

There are different features of language lab, which make the students to have interactive session. Few are summarized here -

- **Attention:** Attention on subject is increased resulting in better retention of the concepts. As the language lab allows the student to listen to the program stimulus individually, each individual student's attention is focused on the program material being studied, ultimately increasing the attention span of the student and teaching the student to listen and analyze the content of the lesson.
- **Acoustics:** It provides equal opportunity to all the students to hear the instructor irrespective of place where they are seated. There will be less miscommunication because of direct nature of the sound transmission. The language lab provides all students no matter where they are seated in the room with equal opportunity to hear the instructor and to be heard by the instructor. None of the lesson material is misheard due to the direct nature of the sound transmission. Each student can listen to the lesson material at a level set by themselves for their own comfort.
- **Building student experience:** Students can build on their existing experiences and gain further knowledge of computers while learning in the computer language lab. Practicing with systems, software and new applications enhances exportable skills. The more experience students have with computer technology, the more successful they will be in the "real world".

- **Developing listening skills:** Listening skills are an essential element in becoming linguistically fluent. The language lab helps students develop good listening skills and aids the process of communication. Furthermore, it develops the listening and communication skills, since they hear correct pronunciation through their headphones.
- **Excitement:** Students become excited when using learning lab systems. The student's attention is heightened and the boredom of repetitive learning is lifted. Learner will show more enthusiasm and excitement in learning lesson because of learning lab system.
- **Efficiency:** The teacher can monitor individual students (and talk to them) much more efficiently than in a regular classroom. Usually in a regular classroom all other students stop speaking when the teacher communicates with an individual student. In a lab they will continue working without interruption.
- **Appropriate use of time:** The language lab makes most efficient use of time, improving the teacher/student time ratio and allowing the instructor to maximize the use of time in a given lesson. Efficient use of time and learning efficiency is much more than usual classroom learning.
- **Improve discipline:** The instructor can improve the discipline of the class by privately conversing with individual students who are being objectionable. By utilizing a system of seat management, any equipment faults or acts of minor vandalism can be reported by the next student entering the booth. If not reported by the student, they become the target of the investigation when the next student enters the booth. Students have great difficulty talking to each other when wearing headsets.
- **Individualization:** Labs provide the capability for dividing the class into several groups. These groups can be listening to different programs on varying subject matter and at different levels of interactivity. This set up fosters more interactive session between students and teacher.

- **Internet access:** The new generation of multimedia systems allows the students to be connected to the World Wide Web and to be able to access information on a global basis. This allows instantaneous access to information worldwide and communication in the following ways -
  - Access to foreign literature and museums for research and study.
  - Direct communication with other students from their country and culture of study.
  - Person-to-person communication through email, chat rooms, internet phone, etc.
  - Student-to-student video conferencing with local and foreign classes.
  - Viewing English and target language web sites.
  - Watching live TV broadcasts and listening to foreign radio broadcasts.
- **Native speaker/ Different voice:** The lab provides the students with a variety of model voices rather than just the voice of the teacher (who is often not a native speaker). All modern systems have a Model Voice feature allowing a native speaker to converse and be used as a model voice subject for the rest of the class.
- **Overcoming shyness:** Lab systems tend to make students more anonymous. Language labs motivate students to talk freely and lose the shyness when talking in front of their friends.
- **Oral testing:** Oral test features allow instructors to test students with a question or stimulus and only record the student's answer. Instructors can then play back the recorded answers at a later time for grading, without having to listen to the questions.
- **Privacy:** It also provides the privacy that encourages the shy students to speak without any hesitation. In addition instructor can speak to individual or group of students in privacy without interrupting rest of class. The headset/microphone provides students with a psychological privacy that promotes their speaking ability. It reduces the inhibitions felt in normal classroom situations.

- **Provide feedback:** The instructor can easily generate records of attendance, grading and oral responses to true/false or multiple choice taped tests. An automated record keeping process can save much time. The student's progress can also be monitored regularly so that teacher can provide feedback based on individual pace and ability.
- **Record/Comparing:** The students have the ability to record their own voices along with the master stimulus. Each student can be working interactively on different segments within the same program or be working with completely different program material.
- **Role playing exercises:** Using the random pairing/random grouping feature that all advanced modern learning systems incorporate, instructors can generate a variety of exercises structured around role-playing. Students can be paired or grouped together in small numbers and hold conversational practice with each other. Due to the random selection of student partners the student's interest level is always high in anticipation of who their paired partner is likely to be. The instructor can also allow the students to listen to a stimulus from the console allowing the students to practice with each other while responding to the master stimulus.
- **Self-pacing:** The students may work through the lesson material at a pace suited to their ability. The lab is for them a personal tutor. Thus, allowing the classroom as student-centered approach. The students can access digitally stored programs, exercises and tests that can be completed at their own pace and at a time they decide are appropriate.
- **Teacher monitoring:** Since the teacher is not concentrating on producing the next question or drill, he/she can concentrate more on the student responses. The instructor has more time to produce materials and oversee class activities due to the automatically, rather than manually, controlled instructor console features. Teacher can look after each student, which is not possible in case of the regular

classroom. In a lab instructor can communicate with many students by pressing a mouse key in order to talk with students.

- **Variety:** The language lab provides variety from regular classroom situations. The teacher's role is changed and the students are more active for longer periods of time. The use of visual stimulus coupled with selective audio materials increases the attention span of the students. The language lab brings variety in teaching learning process instead of boring verbal centered teaching.

Wilson and Thayalan (2007) highlighted some of the features of language laboratory are given below -

- A tool designed for teaching any language.
- Effective communicative training programmes for the general public, private and corporate sectors, junior and senior level officers can be given through the lab.
- Efficient teaching programs of communication for the students.
- Experts are able to use the language laboratory for creating and editing technical resources for teaching language.
- General documentation, software documentation and all forms of technical documentation can be done.
- It helps students to be familiar with the different aspects of the language like pronunciation, accent, stress and all other aspects of the phonetics of a language.
- Online lessons and oral examinations can be carried out through the language laboratory.
- Web-content creation, the setting up of in-house news magazines, corporate publicity and identity, and teaching materials can be generated through the language laboratory.

13.6 OBJECTIVES OF LANGUAGE LABORATORY

The objectives of language laboratory are -

- To improve listening skills - classroom and individual with high quality audio.

- To improve speaking skills - individual, paired, groups.
- To present and demonstrate language skills - both screen and voice in seconds.
- To monitor and guide students - discrete monitoring and intervention as required.

The purpose of a language lab is to involve students to actively participate in language learning exercises and get more practice than otherwise possible in a traditional classroom environment.

13.7 KINDS OF LANGUAGE LABORATORY

The language laboratory assists educators in delivering foreign language instruction, and has been through many developmental stages over the years. Four kinds of laboratories are being focused on here -

- **Conventional Laboratory:** This is the primitive form of the language laboratory. The conventional lab has a tape recorder and a few audiocassettes of the target language to teach the learners. The teacher plays the tape and the learners listen to it and learn the pronunciation. As it is used in a normal classroom setup, it is prone to distractions and this type of laboratory is no longer common.
- **Lingua Phone Laboratory:** This is again a conventional type of lab, with a little modernization. Learners are given a headset to listen to the audiocassettes being played. Here distractions are minimized and a certain amount of clarity in listening is possible.

There is also a modernized lingua phone laboratory available today, which uses an electronic device that has two functions. It works as a cassette player with all the features of a normal cassette player on the left side and as a repeater on the right side that helps one to record one's voice and play it back for comparison.

- **Computer Assisted Language Laboratory (CALL):** CALL uses the computer to teach language. The language course materials are already fed into the computer and are displayed according to the features available in the system. Nowadays, there are also

laboratories with computers with a connection to the internet. These are called Web Assisted Language Laboratories (WALL). The development of CALL has been gradual, and this development has been categorized into three distinct phases: Behavioristic CALL, Communicative CALL and Integrative CALL (Barson & Debski, 1996). Though the development of CALL has been gradual, its acceptance has come slowly and unevenly.

- **Multimedia Hi-Tech Language Laboratory:** There is a lot of software available on the market that can be used in the multimedia language laboratory, for example -
  - Renet
  - Aristoclass
  - Hiclass
  - Globarina
  - Console OCL-908W
  - Histudio MHi Tech
  - Online Software

13.8 STEPS TO CARRY OUT THE ACTIVITIES OF THE LANGUAGE LABORATORY

The following steps are suggested to carry out the activities of the language lab -

- Identify the problem that needs practice
- Choose the correct type of drill
- Prepare the tape/CD script
- Make the recording
- Check the recording
- Evaluate the activity.

13.9 ADVANTAGES OF LANGUAGE LABORATORY

Using a language lab has many benefits. They are -

- **Gets into deeper side of language:** This application gets into deeper side of language rather than covering its outer layer, which are mostly seen in the year old teaching practices. The practical sessions provide the chance for understanding the clear concept regarding right pronunciation, different accent and other aspects of language learning too.
- **The language lab is available in many standards:** The language lab is available in many standards which can be used for teaching the people in different sectors. Some of the training programmes are included at junior, senior school level, private, public and also for the people at corporate sectors. The language lab does provide additional assistance like producing documents, editing, creating documents for teaching, students' reference etc.
- **Language labs allow for diversity in the classroom:** Language laboratories provide teacher attention to students, especially in the case of schools with different levels because as interactive courses, language labs are tailored to the individual needs of students. On the other hand, thanks to monitoring and evaluation in real time, the teacher knows exactly what course objectives pose major difficulties for the student time and can reinforce the class accordingly.
- **A language lab is practical:** Language labs provide practice in an entertaining and interactive way to acquire the four main language skills: listening, speaking, reading, and writing. Students learn more comprehensively through a language lab.
- **Students learn much faster in the language lab:** Language labs' interactive courses help students learn much faster than in a regular classroom setting. The methodology of the classroom language network uses a progressive model to promote natural learning, where students learn the different concepts of language in an intuitive way.
- **The teacher takes on a more important role in the language lab:** The language lab provides supplementary materials that only facilitate the role of the instructor rather than compete with it. The

teacher can then focus on the important parts of the course rather than waste time explaining everything. The structure of the language lab courses also facilitate the work teacher puts in when preparing lessons and allows them to prepare them in less time and with a greater volume of interactive resources.

- **Labs foster communication in the classroom:** Language labs also encourage communication student-teacher as well as student-student with activities and exercises essential to oral communication and the understanding of the language. The labs include tools for creating groups, host conversations via chat, promote messages on the board, access to a community of students who are also studying the same language, etc. Since language learning in laboratories can be done privately and at their own pace, students who are shy or quite slow in learning the language, become more confident.
- **Learning the language without a time constraint:** It gives different and rare experience for the user to hear the English Language distinctly and precisely. While using the language lab the students get the advantage of listening and learning the language without a time constraint.
- **Assess and improve the speech in English through the self help features:** Another advantage of the language lab is that it helps one to assess and improve the speech in English through the self help features. These features include model pronunciation of words, also the students can use it in record and playback mode that counterpart the user in self assessment. The best part of the laboratory is that it gives the users the freedom to learn the language according to their convenience without an instructor.
- **Allow learners to pronounce certain words correctly:** It allows learners to pronounce certain words correctly. Small details like accent, stress and blending of words can also be corrected. Kids and adults suffering from speech disorders can also use the laboratory to minimize the problems. Not only primary students can

learn from this laboratory. It is also designed for junior and senior executives who wish to improve their speaking proficiency.

- **Auditory oriented:** The direct sound transmission gives step by step guidance from the teacher to the heads of the students with crystal clear clarity. The lab software is more attention enthralling for the students, where they are engaged with individual systems.
- **Comprehensive quickly:** The lab increases the pace of comprehension as students' coaching is purely based on the level of study. The lab regulates the language through the different thoughts created in the mind of the students.
- **Effective learning, Focus Veracity:** By using text, audio and video can easily be integrated with actuality in everyday situations. The lab provides to learn the foreign language practice in a focused setting that eliminates the feelings of self-consciousness.
- **Have the self evaluation:** The students can do a periodical self evaluation to measure the progress as well as evaluate his/her language with that of the expert. The students can record their own voice and play back the recordings, interact with the each other and the teacher, and store the results. The automated learning environment removes one's fear and creates a happy learning situation.
- **Learn the need:** The lab fulfills the need of the learner that is learning the language skills in an effective way.
- **Listening skills are primary in becoming fluent:** Even Level II language labs (the simplest type of system) help develop listening skills, allowing the students to focus on the spoken word and therefore enhancing their ability to repeat and understand the spoken language.
- **Provide individualistic learning:** The ability of each student to speak at the same time and yet be audibly isolated from each other allows efficient use of time and a higher degree of practice and learning. All of the students can practice simultaneously (rather than one at a time) thus increasing the student's actual practice and fluency.

13.10 LIMITATIONS OF LANGUAGE LABORATORY

Although of the various advantages of the language laboratory, it has also a few disadvantages or difficulties, which are related to the high cost, it needs skilled instructors, and it makes unsuccessful instruction in some cases.

- The language lab requires a high cost to be built in the university and to be kept on going. It is very expensive to set up the language lab and country like India there is no lab syllabus and usually language classes are conducted as theory. Furthermore, it needs more money for resource management.
- The language lab would not let the English teaching-learning process be effective if there are some troubles with the technology of it. Worse even, it becomes useless when the electricity is off.
- The language laboratory needs a qualified teacher to be able to activate all the technology provided in it.
- English has to employ technicians who would keep the equipment in the language laboratory always in a high-quality condition.
- These days student does not have enough patience to listen to pronunciation and practice them so the recording of pronunciation is useless.
- As the teacher listens to students randomly the response can be unorganized and ineffective as there are many students to attend to.
- The teacher should be well trained in executing the language lab effectively. Given the nature of teaching, a language teacher may need an assistant in taking care of the technological part while teacher attends to the instructional components.
- As technology changes rapidly, there should be a provision for upgrade in the medium of instructions, which can be burden for school in terms of finances.
- Development of reading and writing skills has no scope in the language laboratory.

- More than 20 students cannot be accommodated in the language lab.
- Competent native speaker's speeches are rarely available.
- In rural schools, installation of language laboratory may be difficult and costly.
- Efficient teachers who can exploit the full possibilities of language laboratory are rare.
  - Microphones, headphones and recorder are provided.
  - In the console, the learner receives the language teaching programme selected by the teacher.
- **The console:** The console is the instructor's room. It has -
  - Master tapes and monitoring equipment for two way communication.
  - Distribution switches to direct the recorded programmes.
  - Monitoring switches to enable the instructor to listen to the learners, to correct, to advise and evaluate them.
  - Intercom switches for two way communication with an individual learner.
  - Group call switch for inviting attention of all the learners to receive general instructions.
  - All call switch for making announcement to the learners regardless of the programme.
- **Control room:** The control room contains all the tapes, records and other equipment, properly indexed for quick use.



CHECK YOUR PROGRESS

Q 1: What is language laboratory?

.....

Q 2: Write one definition of language laboratory.

.....

Q 3: Write one characteristic of language laboratory.

.....

Q 4: How many types of language laboratory.

.....

Q 5: Mention one advantage of language laboratory.

.....

Q 6: Mention one disadvantage of language laboratory.

.....

Q 7: Mention two instruments of a language laboratory.

.....



ACTIVITY 13.1

Write from your own perspectives -

1. The general layout of language laboratory.
2. Use of a language laboratory in language teaching.



13.11 LET US SUM UP

- A language laboratory is a classroom where students use devices to listen and speak languages. It is a classroom in which students learning a foreign language can practice sound and word patterns individually or under supervision with the aid of audio equipment, etc. An example of a language laboratory is a college space where students use headphones to listen and to learn Spanish.
- Some characteristics of language laboratory are - Attention, Acoustics, Building student experience, Developing listening skills, Excitement, Efficiency, Appropriate use of time, Improve discipline, Individualization, Internet access, Native speaker/ Different voice, Overcoming shyness, Oral testing, Privacy, Provide feedback, Record/Comparing, Role playing exercises.
- The purpose of a language lab is to involve students to actively participate in language learning exercises and get more practice than otherwise possible in a traditional classroom environment.

- There are four types of language laboratory - Conventional Laboratory, Lingua Phone Laboratory, Computer Assisted Language Laboratory (CALL) and Multimedia Hi-Tech Language Laboratory.
- The advantages of language laboratory are - gets into deeper side of language, the language lab is available in many standards, language labs allow for diversity in the classroom, a language lab is practical, students learn much faster in the language lab, the teacher takes on a more important role in the language lab, labs foster communication in the classroom, learning the language without a time constraint, assess and improve the speech in English through the self help features, allow learners to pronounce certain words correctly, auditory oriented, comprehensive quickly, effective learning, focus veracity, have the self evaluation, learn the need, listening skills are primary in becoming fluent, provide individualistic learning.
- The limitations of language laboratory are - language laboratory needs more money for resource management, it becomes useless when the electricity is off, the language laboratory needs a qualified teacher to be able to activate all the technology provided in it, development of reading and writing skills has no scope in the language laboratory, more than 20 students cannot be accommodated in the language lab, competent native speaker's speeches are rarely available, in rural schools, installation of language laboratory may be difficult and costly, efficient teachers who can exploit the full possibilities of language laboratory are rare.
- The equipments or instruments of a language laboratory are - teacher has a computer with appropriate software for conducting language exercises, teacher and students wear headsets that block outside sounds and disturbances, students have a media player/recorder for listening to audio and recording speech, teacher and student positions are connected via LAN (local area network), in some cases also via separate audio cabling, a server computer or a separate storage device is often used to store lesson materials in a digital format, hearing booth (cubicle), etc.

13.12 FURTHER READING

1) Barson, J. & Debski, R. (1996), Calling Back CALL. Honolulu: University of Hawaii.
2) Hmoud, SNA Al (2014). "The Effectiveness of using English Lab on English Language Students` Pronunciation". Journal of Scientific Research. 1: 84-94.
3) Léon, P.R. (1962). "Laboratoire de langues et correction phonétique". Paris: Didier.
4) Richards, J. (2001), Approaches and Methods in Language Teaching. Cambridge: CUP.
5) Roby, W.B. (2004). "Technology in the service of foreign language teaching: The case of the language laboratory. In D. Jonassen (ed.), Handbook of Research on Educational Communications and Technology, 523-541, 2nd ed" (PDF). Retrieved 2010-01-30.
6) singh, S (2013). "Language Laboratory: Purposes and Shortcomings". journal of Technology for ELT. 3.
7) "Bharathiar University Plans Syllabus Revision", The Hindu. Coimbatore: p.4., 11/9/06.
8) "Colleges should have Language Laboratory on Campus", The Hindu. Coimbatore: p.4., 25/9/06.
9) http://download.ascdirect-usa.com/lab%20benefits/benefits%20and%20advantages.aspx

13.13 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: A language laboratory is a classroom where students use devices to listen and speak languages.

Ans to Q No 2: The Webster's New World College Dictionary definition of the language laboratory is: "A classroom in which students learning a foreign language can practice sound and word patterns individually or under supervision with the aid of audio equipment, etc".

Ans to Q No 3: Building student experience: Students can build on their existing experiences and gain further knowledge of computers while learning in the computer language lab.

Ans to Q No 4: There are four types of language laboratory - Conventional Laboratory, Lingua Phone Laboratory, Computer Assisted Language Laboratory (CALL) and Multimedia Hi-Tech Language Laboratory.

Ans to Q No 5: Language labs' interactive courses help students to learn much faster than in a regular classroom setting.

Ans to Q No 6: Language laboratory needs more money for resource management.

Ans to Q No 7: The two instruments of language laboratory are -

- Teacher has a computer with appropriate software for conducting language exercises.
- Teacher and student positions are connected via LAN (local area network), in some cases also via separate audio cabling.



13.14 POSSIBLE QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: What are the characteristics of language laboratory?

Q 2: What is Computer Assisted Language Laboratory (CALL)?

Long Questions. (Answer each question in around 300-500 words)

Q 1: Write briefly about language laboratory.

Q 2: Write briefly about the advantages and disadvantages of language laboratory.

Q 3: Discuss about the equipments or instruments of a language laboratory.

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UNIT 14 : DISTANCE EDUCATION AND TECHNOLOGY

UNIT STRUCTURE

14.1 Learning Objectives

14.2 Introduction

14.3 Meaning of Distance Education

14.4 Definitions of Distance Education

14.5 Characteristics of Distance Education

14.6 Objectives of Distance Education

14.7 Advantages of Distance Education

14.8 Disadvantages of Distance Education

14.9 Meaning of Educational Technology

14.10 Definitions of Educational Technology

14.11 Characteristics of Educational Technology

14.12 Objectives of Educational Technology

14.13 Applications of Educational Technology

14.14 Role of Educational Technology in the Field of Distance Education

14.15 Let Us Sum Up

14.16 Further Reading

14.17 Answer to Check Your Progress

14.18 Possible Questions

14.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- know the meaning and definitions of distance education;
- discuss the characteristics of distance education;
- enumerate the objectives of distance education;
- explain the advantages and disadvantages of distance education;
- know the meaning and definitions of educational technology;
- discuss the characteristics of educational technology;
- enumerate the objectives of educational technology.

- identify the applications of educational technology.
- describe the role of educational technology in the field of distance education.

14.2 INTRODUCTION

Educational technology plays an important role in distance education system. By adapting new communication educational technologies in distance educational programmes their quality could be ensured. Instructions conducted through the use of technologies which significantly or completely eliminate the traditional face to face communication between teacher and students lead to distance education. Now a days, media such as computer, artificial satellites, digital libraries, telephones, radio and television broadcasting and other technologies are presenting their potential for the purpose. Audio, video and print materials provide the base while internet is becoming cheap, fast and effective medium. Immense resources are already available on the web. In addition, technology is rushing to bring in revolution in the field of distance education. So in future, positive changes can be apprehended.

14.3 MEANING OF DISTANCE EDUCATION

"Distance learning" refers to the kind of education that is being given, when the trainer and the trainees are not able to be present during the presentation of a lesson at the same place or time. The term "distance education" or "distance learning" is used today to describe the education given to students by conveying educational material from a distance.

Distance education is a form of education in which the participants in educational process - teacher and learners are physically separated and communicated by different means and at different times. In other words, distance education is a way of education remotely without being in regular face-to-face contact with a teacher in the classroom. Distance education is a method of study where teachers and students do not meet in a classroom but use the internet, e-mail, mail, etc., to have classes.

Distance learning, sometimes called e-learning, is a formalized teaching and learning system specifically designed to be carried out remotely by using electronic communication. Because distance learning is less expensive to support and is not constrained by geographic considerations, it offers opportunities in situations where traditional education has difficulty operating. Students with scheduling or distance problems can benefit, as can employees, because distance education can be more flexible in terms of time and can be delivered virtually anywhere.

Popular distance learning technologies include -

- Voice-centered technology, such as CD or MP3 recordings or Webcasts.
- Video technology, such as instructional videos, DVDs, and interactive videoconferencing.
- Computer-centered technology delivered over the Internet or corporate intranet.

14.4 DEFINITIONS OF DISTANCE EDUCATION

Some definitions of distance education are as follows -

- According to Lionarakis (2005), "Distance learning is the education that teaches and enables the student to learn on his own and to operate autonomously in a heuristic self-learning path."
- Wagner (1993) defines distance learning as, the 'Transfer of educational interaction or educational programming to geographically remote individuals and groups."
- Shale and Garrison (1990) argued that the definitions of distance learning focus mainly on the distance between teacher and students than in the educational process, which limits how we see distance education as well as the potential future trends.

From the above definitions, it can be concluded that, Distance Education (DE) is an umbrella term which describes all the teaching learning arrangements in which the learner and the teacher are separated by space and time. In fact it is a mode of delivering education

and instruction to learners who are not physically present in a traditional setting of a classroom. Transaction of the curriculum is effected by means of specially prepared materials (self-study (learning) materials) which are delivered to the learners at their doorstep through various media such as print, television, radio, satellite, audio/video tapes, CD-ROMs, Internet and World Wide Web etc. Also a technological medium replaces the inter-personal communication of conventional classroom based education that takes place between the teacher and the learners. Communication between the institution, teacher and learners is mainly through electronic media (telephone, interactive radio counselling, teleconferencing, videoconferencing, chat sessions, email, website etc.) and also through postal correspondence and limited face to face contact sessions held at Study Centers that are set up by the DE institutions as close to the learners' homes as possible.

14.5 CHARACTERISTICS OF DISTANCE EDUCATION

Nature and characteristics of distance education can be outlined below -

- Separation of teacher and learners in space and time.
- Use of different media to realize the interaction among teacher, learners and educational content.
- The provision of two-way communication between teacher and learners.
- Control of the learning process by the learners rather than the teacher.
- Influence of an educational organization.
- Need of students evaluation.

14.6 OBJECTIVES OF DISTANCE EDUCATION

The objectives of distance education are as follows -

- **To provide an effective alternative path to wider opportunities in education and especially in higher education:** There are

different categories of potential learners. There are some who never been able to enter into any institution of higher learning. There are some who just need additional knowledge in a particular discipline. There are still others who are in need of refresher courses to cope with the latest development in their perfection. For all of those there is need for distance learning or correspondence education.

- **To provide an efficient and less expensive education:** Provision of universal schooling is beyond the means of our country. Increasing population and limited resources is the predicament of our educational planners. It is difficult to divert huge sums of money in a developing economy to match the required level of expansion for traditional schooling. Distance education is the only practical alternative.
- **To provide education facilities to all qualified and willing persons:** The objective of correspondence courses is to provide education facilities to all qualified and willing persons who are unable to join regular university and other courses due to various reasons. For them, there is an incessant search for an alternative system and that system is distance education.
- **To provide opportunities of academic pursuits to educated citizens willing to improve their standard of knowledge:** There are many learners, both young and adults, who cannot afford to join the face-to-face system of education due to personal and professional responsibilities. For such type of persons, some provisions have to be made through distance education. Hence, the objective is to provide opportunities to improve the standard of knowledge and learning through continuing education while in employment.
- **To provide education facilities to those individuals who look upon education as a life-long activity:** Distance education facilities are needed for those individuals who look upon education as a life-long activity or to acquire knowledge in a new area. Because lifelong education is emphasized for all stages of life. In this context,

the report of the National Policy on Education, 1986 is worth-mentioning here.

The NPE-1986 says, "Life-long education is a cherished goal of the educational process. This presupposes universal literacy. Opportunities will be provided to the youth, housewives, agricultural and industrial workers and professionals to continue the education of their choice, at the pace suited to them. The future thrust will be in the direction of open and distance learning. "

The distance learning system must be well-supported with instructional materials, and suitable radio and television programmes in different areas of study. This correspondence education or distance learning is becoming popular and being accepted as an alternative and economical approach to our formal education system.

14.7 ADVANTAGES OF DISTANCE EDUCATION

Distance education has some fundamental advantages -

- **Flexibility and independence:** Distance education is education at a convenient place and time and is self-paced learning.
- **Wide learner audience:** Numerous learners take part in distance learning courses as compared to traditional education.
- **Accessibility:** Distance education overcomes some limitations for certain groups of people - older people and people with disabilities; people who live in remote places; people who work and cannot disturb their work. Distance education helps them combine learning with their jobs. People from different social, cultural and economical groups are integrated.
- **Life-long learning:** People can study throughout their whole lives in different fields of knowledge.
- **Economical effectiveness:** Distance education cuts down expenses for learners and for the institution which organizes this form of education.

14.8 DISADVANTAGES OF DISTANCE EDUCATION

Distance education has some disadvantages -

- **Isolation:** Learners in distance education courses are separated from the teacher and sometimes feel uncomfortable because there is no visual interaction with other participants. Learners sometimes feel lack of support and reassurance in moments when the learning content is more difficult and they have problems with it.
- **Loss of motivation and self-discipline:** Motivation is a basic agent in distance education. Loss of motivation will bring negative results. Learners should be strongly motivated in order to finish their education. Self-discipline is linked to motivation. In most of the cases the teacher controls a final due date for individual tasks and projects, but learners are responsible for its implementation. Loss of motivation and self-discipline can be noted in certain cases.
- **Short period of courses:** Distance education courses are shorter than traditional ones. This requires assimilation of the learning content in a shorter period of time and could be difficult for some learners.
- **High costs:** At the beginning of the development of distance education course expenses are considerable - not only financial, but also time. Teachers spend a lot of time to prepare and structure the whole course - time for examination of the audience, review of existing learning materials and already created courses, time for preparation of learning instructions.

14.9 MEANING OF EDUCATIONAL TECHNOLOGY

Educational technology is the development, application and evaluation of systems, techniques and aids to improve the process of human learning. In almost all the important activities engaged in the name of teaching, training or instructions the possibility of using educational technology has been explored and is being explored, even today. Educational technology is a matter of making education more meaningful or a question

of improving its quality or even the issue of making it accessible to more children. One thing that always prominently matters is the teacher, the quality of his preparation and his maintenance as a professional. His/her performance is the most crucial input in the field of education. So, their training with special linkage with technology is one of the most essential needs. The use of educational technology is an innovative practice, which needs to be adopted by every teacher.

The concept of educational technology is used in two ways - educational technology means the use of mass media and audio-visual aids in education or technology in education. Educational technology means utilization of all available resources in a system in order to optimize teaching learning process or technology of education.

The utility of technologies like audio-visual aids, equipment, machines etc. such a Chalkboard, Over Head Projector (OHP), TV, and Computer in education called the "Technology in Education". Here more importance is given to the media used for carrying a message, whereas the other approach to Educational Technology is "Technology of Education". This approach characterizes the methodology appropriate to learners' needs, learning objectives, the process of learning and teaching as well as availability of resources. Technology of Education includes Technology in Education.

According to the British Journal of Educational Technology published by the National Centre for Educational Technology -

"Educational technology basically means all the intellectual and operational efforts made during recent years to regroup, arrange and systematize the application of scientific methods to the organization of new sets of equipment and material so as to optimize learning process".

According to Technical Working Group for Educational Technology in Asia under APEID - 1995 defined educational technology as:

"Educational technology is a separate field dealing with the theory of education .with development and application of the educational resources which implies following principle -

- Clarifies educational objectives.
- Placing content of elements in a logical order.
- Specifies the process of teaching learning.
- Acquires the knowledge through development of models of teaching.
- Adjoining the teaching learning process with feedback.
- Selection, evaluation and optimization of media.

14.10 DEFINITIONS OF EDUCATIONAL TECHNOLOGY

Some definitions of educational technology are as follows -

- Educational Technology According to G. M. Leith, "Educational technology is a systematic application of scientific knowledge about teaching learning conditions of learning to improve the efficiency of teaching and training. In the absence of scientifically established principles, educational technology implements techniques of empirical testing to improve learning situations."
- Educational Technology According to B. C. Mathis, "Educational technology refers to the development of a set of systematic methods, practical knowledge for designing, operating and testing schools." B. C. Mathis has emphasized the development of teaching methods and skills for testing the performance.
- Educational Technology Robert Cox has defined the term educational technology in the following manner, "Educational technology is an application of scientific process to man's learning conditions to what has come recently to be called educational or instructional technology."
- Educational Technology E. E. Haddan defined educational technology as "Educational technology is that branch of educational theory and practice which is concerned primarily with the design and use of message which control the learning process."
- Educational Technology S. S. Kulkarni has defined the term educational technology in the following manner, "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."

- According to K. Mitra, "Educational technology can be conceived as a science of techniques and methods by which educational goal can be realized."

14.11 CHARACTERISTICS OF EDUCATIONAL TECHNOLOGY

Educational technology in its greater and wider sense includes the entire process of setting of objectives, it deals with the systematic application of the resources of scientific knowledge to the process that each individual has to pass through in order to acquire and use knowledge. The basic characteristics of educational technology are as follows -

- **Based on Science and Technology:** Educational technology is based on science and technology, so it is influenced by science and technical advancement.
- **Application of Scientific Principles:** Educational technology studies the effect of science and technology upon education. In other words, science and technology are used under educational technology. Hence, it is the practical aspect of science.
- **Continuous and Dynamic Method:** Educational technology is a continuous, dynamic, progressive and effect-producing method.
- **Emphasizes on Teaching-Learning Methods and Techniques:** It lays stress on the development of methods and techniques for effective teaching learning. It also stresses the organization of learning situations for effective realization of the goals of education.
- **Comprehensive Term:** It is a very comprehensive term and is not to be viewed in terms of its parts of processes. New conceptions are possible only due to educational technology such as programmed learning, instructional technology, teaching technology, micro-teaching, simulated teaching, interaction analysis, video-tape, tape-recorder, projector and computer, etc.

- **System Approach:** Audio-visual aids cannot be termed as educational technology. Educational technology accepts schools as a system. In this system, the school-building, furniture and teachers act as input. While various methods, techniques, strategies and the teaching and examination act with the help of audio-visual aids.

14.12 OBJECTIVES OF EDUCATIONAL TECHNOLOGY

Objectives of Educational Technology are as follows -

- To determine the goals and formulate the objectives in behavioral terms.
- To analyze the characteristics of learner.
- To organize the content in logical or psychological sequence.
- To mediate between content and resources of presentation.
- To provide the feedback among other components for the modification of learners.
- To evaluate the learners performance in terms of achieving educational objectives.

14.13 APPLICATIONS OF EDUCATIONAL TECHNOLOGY

The applications/scope of educational technology is in following areas:

- Mass education
- Historical information
- Costly and hazardous experiments
- Gaming and simulation
- Distance education and many more.

Educational technology is used to raise the efficiency of education. But with the passage of time, the system of education is facing new problem to be tackled. So, the hardware and software of educational

technology are ever expanding. Following are some of the applications of educational technology that are worth noting.

- **Mass education:** There has been explosion of population and knowledge. There is, therefore, a need to educate the masses. So, educational technology has a tremendous application to educate a large section of people and to impart a large amount of knowledge in a limited span of time. In this regard, the mass media viz., TV, radio, newspaper and other modern technologies like computers and information technology (E-mail, internet, etc.) has a lot of scope.
- **Historical information:** Any branch of knowledge that we deal which has a historical base. Such information is of tremendous importance for the students to understand any branch of knowledge in its totality. Such incidents when occur can be recorded with the help of audio-video cassette or documented in the form of a written or printed material. Such documents become the source of information for learners to learn. The main advantage of such documents is that we cannot create or repeat the history once more howsoever we try hard and place it before the learners.
- **Costly and hazardous experiments:** In many fields of science and technology there are some experiments having great implications for effective learning which are not advisable for the teacher to conduct in the classroom because of cost and health hazards involved. Such experiments, once conducted carefully in the laboratory or elsewhere can be recorded with the help of new electronic technology and be used by teachers and students for effective learning.
- **Gaming and simulation:** If historical events which are either costly or hazardous which cannot be conducted, then educational technology can rescue us by doing the same through simulation. Computer technology in this regard plays a main role. This can provide a life like picture of phenomena in three dimensions. It can also show the operation of different parts of a phenomenon and the consequences. The other possibility is games. Children can learn,

through play, many concepts that just cannot be taught in the formal set of the classroom. The gaming and simulation has a great scope in the training of military personnel and in the field of aviation.

- **Distance education:** Educational technology has a great scope in distance education and open school programme. Today there is a great need for personnel training and education on regular basis for updating oneself in the field of work. In this regard, distance education programmes, a relatively less formal process of education, have acquired new status. Educational technology with its innovative practices can educate the learners who cannot come to the classroom setup for their education. In this regard programmed learning materials, modules, contact programme and counseling are some innovations which can help distance learners.

Applications of educational technology can also be outlined as follows -

- Educational technology improves the teaching-learning process and makes it more effective and process oriented as well.
- Electronic and mechanical gadget which a common man possesses can be used for educational requirements.
- Educational technology has not only maintained the standard of education but also improved the ways of teaching by giving teaching aids and programmed instructional material etc.
- Television, radio, V.C.R. and computers can enrich as well as effect very much the education. Television, radio, tape-recorder and programmed instruction can also do wonders in the field of distance and correspondence education.
- Mechanism of feedback devices for modification of teaching-learning behaviour can produce effective teachers in training schools.
- New innovation of system analysis in the field of educational technology can help in solving educational administrative problems.
- Structure as well as nature of teaching can be developed and enriched with the help of educational technology. It innovates new teaching models through which we can achieve the objectives of education.

- Scientific foundation of education which is the main force of development of the theories of teaching and instruction is providing by educational technology.
- Educational technology provides practice and strategies for reducing individual differences or strategies and practices which help teachers to teach according to individual differences of the learners.



CHECK YOUR PROGRESS

Q 1: What do you mean by distance education?

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Q 2: Write one definition of distance education.

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Q 3: Write one characteristic of distance education.

.....

Q 4: Write one objective of distance education.

.....

Q 5: Write one advantage of distance education.

.....

Q 6: Write one disadvantage of distance education.

.....

Q 7: What is educational technology?

.....

Q 8: Write one definition of educational technology.

.....

Q 9: Write one characteristic of educational technology.

.....

Q 10: Write one objective of educational technology

.....

Q 11: Write one important application of educational technology.

.....

Q 12: What is WBE?

.....

Q 13: Mention two technological means used in distance education.

.....

14.14 ROLE OF EDUCATIONAL TECHNOLOGY IN THE FIELD OF DISTANCE EDUCATION

The development of distance education is related to the development of new information and communication technologies. Some of the existing technologies are an addition to traditional education, while others can substitute it entirely. Some technologies do not provide interaction between learners, others do in various forms. Another point of view is that some technologies emphasize synchronous education - learning and interaction in real time, others - asynchronous education - self-pace learning. The various technologies used in distance learning can be divided into four categories: print, audio, video and computer. However, many of the technologies overlap into more than one category.

- **Print Technologies:** In the opening stages of distance education correspondence by mail was the main delivery method to learners. The print materials included books, textbooks, and manuals. The advantages of the print materials are related to the opportunity for flexibility to learn in convenient time and place for learners who can learn own pace. Most learners are very comfortable using print materials, which are easy to use. The disadvantages result from slow speed of delivery of materials, and the lack of communication and feedback between the participants in the educational process. The print materials are static and they do not use multimedia objects.
- **Audio Technologies:** This group includes audio cassettes, radio, telephone, and audio conference. With audio materials we can demonstrate different ways to learn specific skills by learners. Some of the audio materials provide two-way connection and this increases interaction between the participants in the education process. Most of the audio technologies are relatively inexpensive. They are easily accessible and easy to use. The main disadvantage of audio technologies is that abstract and more complicated concepts are difficult to understand without video materials and visual contact with the teacher. On the other hand, audio conferences require

synchronization between the teacher and learners and sometimes this is inconvenient.

- **Video Technologies:** This group contains video cassettes, satellite and cable programs, and video conference. Video materials allow audio and video communications which make distance education similar to traditional education. Video technologies enable face-to-face interaction between teacher and learners and among learners. Video technologies combine images, digital and analog information. They are expensive and require a great deal of planning, preparation and must be scheduled.
- **Computer Technologies:** The use of computer technologies in education gives an opportunity for computer data storage of learning materials and accessibility around the world. Computer materials can contain text, graphics, audio, and video. Computer technologies allow high level of interactivity and immediate feedback.

In conclusion we could say that there are many technologies for delivering of learning content. Technology is an important factor in achieving effective education. The determining agents when we choose the technology to implement distance education are the goals, the specifics of education and the intended educational group. In many cases combined use of different technologies leads to increased effectiveness of education. The disadvantages of one technology can be overcome by another. The advantages of certain technology can be strengthened by the use of an additional technology.

Web-Based Education

- **Distance education via Internet:** The use of new computer and communication technologies and the wide-spread use of the internet in every aspect of our life reflect upon education and leads to considerable changes in the means and methods of education. Each of the stages of learning - the preparation of learning materials, the delivery to learners, and the process of knowledge evaluation and control are based on these new technologies. Distance education via internet is becoming widely used and important.

Web-based education (WBE) encompasses all aspects and processes of education that use World Wide Web as a communication medium and supporting technology. There are many other terms for WBE; some of them are online education, virtual education, internet-based education, and education via computer-mediated communication.

Distance education via the internet is a form of a distance education which uses various internet services - email, file transfer, WWW. A new stage in the development of distance education is Web-based education. It is used not only in educational institutions, but also in administrative and business organizations.

- **Nature of Web-based education:** Web-based education uses WWW as a virtual environment to present learning materials in order to implement the education process. This environment includes all educational processes - from lectures, assignments, and seminars to learners' evaluation. The interaction between the teacher and learners could be asynchronous (email, bulletin boards, file transfer) or synchronous, in real time (chats, discussion forums, audio and video conference). The specific features of Web-technology assume quick realization of all learning activities. Web-based education could be an addition to traditional education or it could substitute it.

Advantages of Web-based education

Web-based education has all the advantages of distance education, but due to the use contemporary communication technologies it presents new considerable opportunities -

- **Global accessibility:** WWW is a tremendous depository of information and provides users vast resources. There is an enormous amount of learning materials in various fields of knowledge and they are accessible from all over the world.
- **Actual and dynamic changing learning content:** Learning content is dynamic and the teacher can renew it continuously. The process of actualization of the learning materials is easy and quick. The computer materials are reusable. Most of them can be used repeatedly in different distance education courses.

- **Media objects:** Web-based education provides interactive means to present media object - documents, video and audio materials. Media objects can be built in learning content by information technologies.
- **Searching of learning content:** The main characteristic of WWW is navigation through hyperlinks. The students navigate from one learning resource to another. They can search the education content. This allows distance education to spread out of the boundaries of the particular course.
- **Wide range of activities and assignments:** Web-based education includes various activities and assignments which develop different students' skills. The circle of education is closed by the existing test and task systems. These systems increase the control and self-control upon the students' knowledge.
- **Actual feedback:** The teachers receive actual information about the students` level of assimilation of learning content and can emphasize on complicated elements.
- **Good communication between participants:** There are means for communication between participants. The teachers help students in solving problems.
- **Multiplatform technology:** Web-based education is independent from operating system. Interfaces for the Web exist on all platforms. Students need only a web-browser to use WWW. They do not need preliminarily education about how to use the materials in a course, because the interface is graphical and the environment is user-friendly.

Disadvantages of Web-based education

The disadvantages of web - based education are as follows -

- **Security of information:** One of the main disadvantages of Web-based education is the security of information in Web space and reliability of the systems for distance education. The efforts of the creators of these systems are aimed at their protection from illegal access.

- **System failures and connection speed:** Big problems are the systems' failures although most systems for distance education have archive and backup copies. The main environment for delivering information to students is WWW. This requires fast-speed connection. In cases of synchronous communication slow-speed connection can disturb normal learning process.
- **Waste of time:** The development of the Web-based courses is connected with waste of time. At the beginning expenses are significant but further support is much simple.
- **An authenticity of information:** There are so many resources in Web. The main problem is related to the authenticity of information. The searching of the learning content in Web finds many results and many of them are not qualitative enough.
- **Copyrights:** A much debated question is the problem about copyrights of the electronic materials. Unfortunately, synonymous decision is not made.
- **Difficulties of implementation of some pedagogical approaches:** The internet gives large opportunities but some pedagogical methods of approach cannot be carried on in this environment. The specific disciplines might exclude application of computers and virtual medium for their implementation.

Technological means used in distance learning

Computer-based Technology using -

- Satellite connections,
- Electronic boards (bulletin board system),
- Closed circuit television,
- Phone,
- Fax,
- Mobile phones,
- E-mail,
- Internet,
- Video - conference,
- Chat, etc.

Approaches used in distance learning

- An important element for students in online classes is the combination of self-regulatory and cooperative learning.
- Students have the opportunity to see the work of other learners at a time of their choice and compare their ideas with those of other classmates.
- Create groups with common questions and concerns.
- In the online environment, pupils are trained to work together with others in the same cognitive field.

Distance education means education that uses one or more of the following technologies

- To deliver instruction to students who are separated from the instructor; and
- To support regular and substantive interaction between the students and the instructor, synchronously or asynchronously.

The technologies used may include -

- The internet;
- One way and two way transmissions through open broadcast, closed circuit, cable, broadband lines, fiber optics, satellite, or wireless communications devices;
- Audioconferencing;
- Videocassettes, DVDs and CD-ROMs.

Distance education becomes more and more prevalent in contemporary society. It is an integral part of education regardless of its form and technologies used. In the center of the intention of the teachers are the necessities of the students and their specific features. Many various approaches for presenting the learning content and technologies for delivering it to students exist. They are subsidiary means for education and can increase its effectiveness. Distance education courses are effective when they are carefully planned in consideration with students' needs and profile. The learning content should be designed to be useful to them. The appropriate technologies for implementation of distance education courses are selected after that. The teachers'

efforts should be turned to overcoming the existing risk of shifting the emphasis from the essence of the learning content to the technologies for its presentation and delivering.



ACTIVITY 14.1

Write from your own words -

1. Make a difference between distance education and traditional education system.
2. How does Web-based education work on a day-to-day basis?



14.15 LET US SUM UP

- "Distance learning" refers to the kind of education that is being given, when the trainer and the trainees are not able to be present during the presentation of a lesson at the same place or time. The term "distance education" or "distance learning" is used today to describe the education given to students by conveying educational material from a distance.
- Nature and characteristics of distance education - separation of teacher and learners in space and time, use of different media to realize the interaction among teacher, learners and educational content, two-way communication between teacher and learners, control of the learning process by the learners rather than the teacher, influence of an educational organization, need of students evaluation.
- The objectives of distance education are - to provide an effective alternative path to wider opportunities in education and especially in higher education, to provide an efficient and less expensive education, to provide education facilities to all qualified and willing persons, to provide opportunities of academic pursuits to educated citizens willing to improve their standard of knowledge, to provide education facilities to those individuals who look upon education as a life-long activity

- Distance education has some fundamental advantages - flexibility and independence, wide learner audience, accessibility, life-long learning, economical effectiveness.
- Distance education has some disadvantages - isolation, loss of motivation and self-discipline, short period of courses, high costs.
- The concept of educational technology is used in two ways - educational technology means the use of mass media and audio-visual aids in education or technology in education. Educational technology means utilization of all available resources in a system in order to optimize teaching learning process or technology of education.
- The basic characteristics of educational technology are - based on science and technology, application of scientific principles, continuous and dynamic method, emphasizes on teaching-learning methods and techniques, comprehensive term, system approach.
- Objectives of Educational Technology are - to determine the goals and formulate the objectives in behavioural terms, to analyze the characteristics of learner, to organize the content in logical or psychological sequence, to mediate between content and resources of presentation, to provide the feedback among other components for the modification of learners, to evaluate the learners performance in terms of achieving educational objectives.
- The applications/scope of educational technology is in these areas - Mass education, Historical information, Costly and hazardous experiments, Gaming and simulation, Distance education and many more.
- The development of distance education is related to the development of new information and communication technologies. Some of the existing technologies are an addition to traditional education, while others can substitute it entirely. Some technologies do not provide interaction between learners, others do in various forms. Another point of view is that some technologies emphasize synchronous education - learning and interaction in real time, others -

asynchronous education - self-pace learning. The various technologies used in distance learning can be divided into four categories: print, audio, video and computer.

- Web-based education (WBE) encompasses all aspects and processes of education that use World Wide Web as a communication medium and supporting technology. There are many other terms for WBE; some of them are online education, virtual education, internet-based education, and education via computer-mediated communication.
- The specific features of Web-technology assume quick realization of all learning activities. Web-based education could be an addition to traditional education or it could substitute it.
- The advantages of Web-based education are - global accessibility, actual and dynamic changing learning content, media objects, searching of learning content, wide range of activities and assignments, actual feedback, good communication between participants, multiplatform technology.
- The disadvantages of Web - based education are - security of information, system failures and connection speed, waste of time, an authenticity of information, copyrights, and difficulties of implementation of some pedagogical approaches.



14.16 FURTHER READING

1) Baker, J. (2003). Instructor immediacy increases student enjoyment, perception of learning. Online Cl@ssroom: Ideas for Effective Instruction, Sept. 2003.
2) Bates, Anthony, (1982). Roles and characteristics of television and some implications for distance learning. Distance Education, 3, 1, pp. 29-50.
3) Beaudoin, M. (1990). The instructor's changing role in distance education. The American Journal on Distance Education, 4(2):21-29.
4) Beaudoin, M. F. (2003). Distance education leadership: An appraisal of research and practice. In M. G. Moore & W.G. Anderson (Eds.),

Handbook of Distance Education (pp. 519-530). Muhwah, New Jersey: Lawrence Erlbaum Associates Publishers.

5) Bodain, Y., Robert J., Investigating Distance Learning on the Internet, INET 2000, 2000 (http://www.isoc.org/isoc/conferences/inet/00/cdproceedings/6a/6a_4.htm - accessed 30.03.2009).

14.17 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The term "distance education" or "distance learning" means to describe the education given to students by conveying educational material from a distance.

Ans to Q No 2: According to Lionarakis (2005), "Distance learning is the education that teaches and enables the student to learn on his own and to operate autonomously in a heuristic self-learning path."

Ans to Q No 3: Use of different media to realize the interaction among teacher, learners and educational content.

Ans to Q No 4: To provide an effective alternative path to wider opportunities in education and especially in higher education.

Ans to Q No 5: Distance education is life-long. People can study throughout their whole lives in different fields of knowledge.

Ans to Q No 6: Distance education courses are shorter than traditional ones.

Ans to Q No 7: Educational technology is the development, application and evaluation of systems, techniques and aids to improve the process of human learning.

Ans to Q No 8: Educational Technology Robert Cox has defined the term educational technology in the following manner, "Educational technology is an application of scientific process to man's learning conditions to what has come recently to be called educational or instructional technology."

Ans to Q No 9: Educational technology is based on science and technology.

Ans to Q No 10: To organize the content in logical or psychological sequence

Ans to Q No 11: Educational technology has a tremendous application to educate a large section of people and to impart a large amount of knowledge in a limited span of time.

Ans to Q No 12: Web-based education (WBE) encompasses all aspects and processes of education that use World Wide Web as a communication medium and supporting technology. There are many other terms for WBE; some of them are online education, virtual education, internet-based education, and education via computer-mediated communication.

Ans to Q No 13: Satellite connections and internet.



14.18 POSSIBLE QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: What are the characteristics of distance education?

Q 2: What are the objectives of distance education?

Q 3: What are the applications of educational technology?

Long Questions. (Answer each question in around 300-500 words)

Q 1: Write briefly about the advantages and disadvantages of distance education.

Q 2: Discuss the role of educational technology in the field of distance education.

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UNIT 15 : RESOURCE CENTRE FOR EDUCATIONAL TECHNOLOGY

UNIT STRUCTURE

15.1 Learning Objectives

15.2 Introduction

15.3 CIET (Central Institute of Educational Technology)

15.4 Activities of the CIET for the Improvement of Teaching Learning

15.5 UGC (University Grants Commission)

15.6 Activities of the UGC for the Improvement of Teaching Learning

15.7 IGNOU (Indira Gandhi National Open University)

15.8 Activities of the IGNOU for the Improvement of Teaching Learning

15.9 NOS (National Open School)

15.10 Activities of the NOS for the Improvement of Teaching Learning

15.11 State ET Cells (State Educational Technology Cells)

15.12 Activities of the State ET Cells for the Improvement of Teaching Learning

15.13 AVRC (Audio Visual Research Centre)

15.14 Activities of the AVRC for the Improvement of Teaching Learning

15.15 EMRC (Educational Multimedia Research Centre)

15.16 Activities of the EMRC for the Improvement of Teaching Learning

15.17 NIST (National Institute of Science and Technology)

15.18 Activities of the NIST for the Improvement of Teaching Learning

15.19 Let Us Sum Up

15.20 Further Reading

15.21 Answer to Check Your Progress

15.22 Possible Questions

15.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- discuss the resource Centre for educational technology - CIET, UGC, IGNOU, NOS, State ET Cells, AVRC, EMRC, NIST
- explain their activity for the improvement of teaching-learning.

15.2 INTRODUCTION

Education Technology has the potential to provide equal opportunities in several ways. Access to educational technology at school can give students from low income homes, where there is little or no access to technology, "a needed edge to compete with children from more affluent homes where technology is common place in other words we can say that guaranteeing access for all classrooms to affordable educational technology in order to achieve curricular goals makes it possible to begin to address the inequities that exist among schools. Grabe and grabe note that technology in the form of telecommunications allow access to people access to interactive services through online discussion groups, interactive conference and interactive tutorials and access to files through online databases, library holdings texts and graphic files on the internet.

15.3 CIET (CENTRAL INSTITUTE OF EDUCATIONAL TECHNOLOGY)

Central Institute of Educational Technology, a constituent unit of NCERT, came into existence in the year 1984 with the merger of Centre for Educational Technology and Department of Teaching Aids. It was set up in NCERT to purchase equipment for State Institutes of Educational Technology. It is an institution under the NCERT which is located at New Delhi. It is a premier Institute of Educational Technology at the national level. Its major aim is to promote utilization of educational technologies viz., radio, TV, satellite communications and cyber media either separately or in combinations and its appropriate use to enhance learning and improve productivity in classrooms and schools. It is mainly concerned with the development of innovations and with using various media in school education. The Institute undertakes various activities to widen educational opportunities, promote equity and improve quality of educational processes at the school level. It comprises several units such as Programmed Learning, Educational Television, Innovations, Production and Evaluation.

It has organized the training of teachers for the Satellite Instructional Television Experiment in different states.

The institute is concerned with education at all levels and in all its aspects. It aims at bringing about improvement of education through various kinds of educational technologies. It has to deal with Pre-primary, Primary, Secondary, University Education, Open University education, Containing Education, Adult Education and so on.

- **Vision:** Vision of the institute is to be the national pioneer and leader in various aspects of the professional improvement and advancement in educational communication and technology, grounded in theory, in research, in practice and in code of ethics, providing solutions by utilizing the innovations, research combined with design, building and managing the resource centre of quality educational media software and integration of technology and pedagogy.
- **Mission:** The mission of Central Institute of Educational Technology (CIET) is to -
- Act as a nodal resource centre for school education media software acquired through national, regional and international sources for reference and research.
- Achieve excellence in design, research and production of educational software for children and teachers, including parents.
- Contribute to teacher education through the convergence of appropriate technologies.
- Build capacities of teachers/educators for quality improvement roles in school education.
- Constructively inform educational policy makers and to critically appraise educational technology (ICT related) policy in India.

15.4 ACTIVITIES OF THE CIET FOR THE IMPROVEMENT OF TEACHING LEARNING

Functions of the CIET

The major functions of the CIET are as follows -

- Designing alternative learning systems to deal with problems of education.
- Orientation of educational planners' administrators to the concept of educational technology.
- Training in specialized areas, radio, audio, television and video production and low-cost teaching aids.
- Production of audio- visual educational materials and other low-cost aids.
- Research and evaluation to test and improve systems, methods and materials.
- Extension services for supplying and screening of educational films, videotapes and audiotapes to Dooradarsan.
- Consultancy of educational technology and distance education programmes.
- Working as coordinating agency with the Ministry of Human Resource Development, State and International Organizations and UN agencies.

Major activities:

CIET has planned the T.V. Curriculum, training script-writers, producers, researchers and technical staff, production of educational programmes and research. So, CIET has been playing a pivotal role in implementing various innovative projects in educational technology both at National and State levels. The major activities are -

- Design, develop and disseminate alternative learning systems
- Promote Educational Technology
- Train Personnel in Educational Technology
- Advise and Co-ordinate activities of SIETs
- Provide Consultancy and media support to other constituents of NCERT

Role of the Institute:

The broad areas of activities of CIET are listed below -

- To design and produce media software especially mass media viz., educational radio and television; interactive multimedia and web based learning resources utilizing ICT to enrich the transactions of curricular activities at different levels of school education.
- To optimize the utilization of EDUSAT communication technologies and terrestrial transmission on national channels: Doordarshan, Gyan Darshan and Gyan Vani.
- To explore and infuse the appropriate and critical use of interactive digital content, web based communication and participatory networks.
- To undertake research and evaluation studies for assessment of need, preparation of audience profiles; undertaking monitoring and evaluation of systems programmes and materials to improve their effectiveness; to study their impact on learning processes, development of children and teachers and efficiencies of systems.
- Documentation of educational media programmes and research for enhancing utilization.
- Dissemination of media programmes through broadcast and non-broadcast modes through the distribution of ACDs, VCDs, DVDs, multimedia CDs and the web.
- Organize capacity building programmes for teachers and teacher-educators in concepts and applications of techniques and technologies for improving classroom instructions and their management processes and State Institute of Educational Technology (SIET) personnel in scripting, production of media programmes, communication and media researches and technical operations.
- To advise and coordinate (a) academic and technical programmes of the five State Institutes of Educational Technology (SIETs) (b) implementation of the National Policy of ICT for School Education, ICT@Schools Scheme.
- To provide consultancy to various organizations and individuals in the development, utilization and evaluation of educational technologies.

The Focus Areas of the Institute

Develop e-content, disseminate e-contents through various modes (transmission, non-transmission through NROER and sales mechanism) and integrate ICTs in teaching learning process through capacity building among teachers through blended mode.

Regular Programmes/Activities being Organised

- Development of e-contents (audio, video, multimedia, etc.)
- Training and retraining of teachers and teacher educators in Educational Technology and new ICT.
- Disseminate e-contents through telecast/broadcast on DD -1, Gyan Vani, Gyan Darshan channels and sales mechanism.
- Third Party Evaluation of ICT Scheme in schools of Karnataka state and UT Chandigarh.

Significant Activities/Works Carried out in the Recent Past

- Developed ICT curriculum for students and teachers
- Developed National Repository of Open Educational Resources (NROER)
- Organized training programmes for teachers and teacher educators of 15 States/UTs through face to face and distance mode.
- Organized All India Children's Educational Audio Video Programmes, Contests and National ICT Award for school teachers

Collaboration with International/National Organisations/Agencies, etc.

- IGNOU and Doordarshan for telecast and broadcast of Audio/Video programmes.
- HBCSE-TIFR Mumbai for creation of NROER.
- SIETs, Viyan Prasar, CCRT, IGNCA, SCERTs for sharing of e-contents on NROER.
- CEMCA for development of QAMLM and promote FOSS environment.
- NIC for hoisting of Websites: ncert.nic.in, ciet.nic.in, nroer.gov.in, itschools.gov.in

15.5 UGC (UNIVERSITY GRANTS COMMISSION)

The UGC was first formed in 1945 to oversee the work of the three Central Universities of Aligarh, Banaras and Delhi. Its responsibility was extended in 1947 to cover all Indian universities. In August 1949 a recommendation was made to reconstitute the UGC along similar lines to the University Grants Committee of the United Kingdom. This recommendation was made by the University Education Commission (1948-1949) which was set up under the chairmanship of S. Radhakrishnan "to report on Indian university education and suggest improvements and extensions".

In 1952 the government decided that all grants to universities and higher learning institutions should be handled by the UGC. Subsequently, an inauguration was held on 28 December 1953 by Maulana Abul Kalam Azad, the Minister of Education, Natural Resources and Scientific Research. The motto of UGC is "Gyan-Vigyan Vimutaye".

In November 1956, the UGC became a statutory body upon the passing of the "University Grants Commission Act, 1956" by the Indian Parliament. In 1994 and 1995 the UGC decentralized its operations by setting up six regional centers at Pune, Hyderabad, Kolkata, Bhopal, Guwahati and Bangalore. The head office of the UGC is located at Bahadur Shah Zafar Marg in New Delhi, with two additional bureaus operating from 35, Feroze Shah Road and the South Campus of University of Delhi as well. As of today the offices can be located in all the major cities including Kolkata, New Delhi and Bangalore. Post-independence the government of India thought that education must be given the maximum importance from the elementary education to the highest levels of education such as the PhD degree. It was set up by the Union Government of India to ensure that the standard of the University education in India is maintained. Professor Ved Prakash was heading this institute when it started and he was a great academician. When talking of UGC, it is the apex body that approves universities in the country. UGC provide funds for affiliated universities and

colleges. The UGC also conducts exams, known as NET, for appointing teachers in colleges.

The University Grants Commission (UGC) came into existence on 28th December, 1953 and became a statutory Organization of the Government of India by an Act of Parliament in 1956, for the coordination, determination and maintenance of standards of teaching, examination and research in university education. UGC has taken steps to implement the recommendations of New Policy on Education such as establishment of Autonomous Colleges, Centers of Advanced Studies in Universities, resurrecting of courses, regular use of media for higher education, establishment of Education Media Research Centers and Audio Visual Research Centers for the use of media and setting up of Academic Staff Colleges for training and orientation of college teachers.

All of India's higher education is managed by the University Grants Commission (UGC) and the various councils. The UGC, set up under UGC Act 1956, has been empowered to promote and coordinate university education in India and also approve grants to them. The UGC is responsible for coordination, determination, and maintenance of standards and release of grants to universities and research organizations. Various professional councils are responsible for recognition of courses, promotion of professional institutions and provision of grants to undergraduate programmes. Though there is no statutory council for software development, NASSCOM is generally accepted as equivalent. A number of Research Councils have also been setup under the aegis of Central Government.

Central Government has the responsibility of coordinating and determining standards in higher education. This responsibility is discharged through UGC which was established in 1956 under an Act of Parliament to take measures for promotion and co-ordination of university education and determination and maintenance of standards in teachings, examinations and research in universities.

The Commission can enquire into the financial needs of the universities; allocate and disburse grants to them; establish and maintain common services and facilities; recommend measures for improvement

of university education and give advice on allocation of grants and establishment of new universities.

The UGC has the unique distinction of being the only grant-giving agency in the country which has been vested with two responsibilities: that of providing funds and that of coordination, determination and maintenance of standards in institutions of higher education. The UGC`s mandate includes-

- Promoting and coordinating university education.
- Determining and maintaining standards of teaching, examination and research in universities.
- Framing regulations on minimum standards of education.
- Monitoring developments in the field of collegiate and university education; disbursing grants to the universities and colleges.
- Serving as a vital link between the Union and state governments and institutions of higher learning.
- Advising the Central and State governments on the measures necessary for improvement of university education.

15.6 ACTIVITIES OF THE UGC FOR THE IMPROVEMENT OF TEACHING-LEARNING

The UGC controls the following in India -

- Maintaining the standard of research, teaching and examination in the universities.
- Promoting university education.
- Making regulations to maintain the minimum standard of education in the country.
- It is a link between the union government and the institutes of higher education.
- It also advises the government about the steps to be taken in order to improve the education system.

UGC plays a vital role in the education of the country. It has ensured that a system it followed in higher education. UGC also ensures that

the education in all these top universities is of the same standard so that the students passing out of these colleges can be considered equal.

15.7 IGNOU (INDIRA GANDHI NATIONAL OPEN UNIVERSITY)

IGNOU was established in September 1985 with the aim of widening access of higher education to larger segments of the population, organizing programmes of continuing education and initiating special programmes of higher education for specific target groups like women, people living in backward areas, etc. IGNOU introduced its programmes in 1987.

Other steps taken in higher education are: establishment of 10 central universities, establishment of Indira Gandhi National Open University (IGNOU) and assistance to other institutions of higher learning's like Indian Council of Social Science Research etc.

It established by an Act of Parliament in 1985, has continuously striven to build an inclusive knowledge society through inclusive education. It has tried to increase the Gross Enrollment Ratio (GER) by offering high-quality teaching through the Open and Distance Learning (ODL) mode.

The University began by offering two academic programmes in 1987, i.e., Diploma in Management and Diploma in Distance Education, with strength of 4,528 students. Today, it serves the educational aspirations of over 3 million students in India and other countries through 21 Schools of Studies and a network of 67 regional centers.

The mandate of the University is to -

- Provide access to higher education to all segments of the society;
- Offer high-quality, innovative and need-based programmes at different levels, to all those who require them;
- Reach out to the disadvantaged by offering programmes in all parts of the country at affordable costs.
- Promote, coordinate and regulate the standards of education offered through open and distance learning in the country.
- To achieve the twin objectives of widening access for all sections of

society and providing continual professional development and training to all sectors of the economy, the University uses a variety of media and latest technology in imparting education.

- **Vision:** IGNOU, the National Resource Centre for Open and Distance Learning (ODL), with international recognition and presence, shall provide seamless access to sustainable and learner-centric quality education, skill up gradation and training to all by using innovative technologies and methodologies and ensuring convergence of existing systems for massive human resource required for promoting integrated national development and global understanding.

"The Indira Gandhi National Open University, the National Resource Centre for Open and Distance Learning, with international recognition and presence, shall provide seamless access to sustainable and learner-centric quality education, skill up gradation and training to all by using innovative technologies and methodologies and ensuring convergence of existing systems for large-scale human resource development, required for promoting integrated national development and global understanding".

- **Mission:** To advance frontiers of knowledge and promote its dissemination through sustainable Open and Distance Learning systems, seamlessly accessible to all, including those hitherto unreached, from among whom the leaders and innovators of tomorrow will emerge, the University shall -
- Strengthen the development of the National Resource Centre as a proactive role model for high-quality and learner-centric Open and Distance Learning system;
- Share professional capabilities and resources to improve standards of distance education in the country;
- Periodically assess and accredit institutions of Open and Distance Learning to promote centers of excellence in the country;
- Develop networks, using emerging technologies and methods, with global reach for effective programme delivery;

- Provide an intelligent and flexible system of education to meet the challenges of access and equity, and work towards development of a knowledge society;
- Forge convergence of all systems and work for seamless education across national boundaries to develop global collaboration and partnership;
- Take education to the hitherto unreached and promote community participation for local development through life-coping skills;
- Provide specific need-based education and training opportunities for continuous professional development and skill upgradation to in-service professionals; and
- Strive towards continuous development of methods and strategies for research and development for generation of knowledge in frontier areas, including Open and Distance Learning.

15.8 ACTIVITIES OF THE IGNOU FOR THE IMPROVEMENT OF TEACHING-LEARNING

The activities of IGNOU are -

- The University has made a significant mark in the areas of higher education, community education and continual professional development.
- The University has been networking with reputed public institutions and private enterprises for enhancing the educational opportunities being offered by it.
- As a world leader in distance education, it has been conferred with awards of excellence by the Commonwealth of Learning (COL), Canada, several times.
- The University is committed to quality in teaching, research, training and extension activities, and acts as a national resource centre for expertise and infrastructure in the ODL system.
- The University has established the Centre for Extension Education, National Centre for Disability Studies and National Centre for

Innovation in Distance Education, to focus on specific learner groups and enrich the distance learning system.

- Emphasis is now being laid on developing interactive multimedia and online learning, and adding value to the traditional distance education delivery mode with modern technology-enabled education within the framework of blended learning.
- Free of cost education is being provided to all jail inmates across the country.
- A large number of SC/ST students have been admitted to various programmes of the University.

Over the years, IGNOU has lived up to the country's expectations of providing education to the marginalized sections of society.

15.9 NOS (NATIONAL OPEN SCHOOL)

In 1979, the Open School was set up as a project of the Central Board of Secondary Education, Delhi. The Open School was not an examining body at that time and its examinations were conducted by the CBSE. In November 1989, the Open School was upgraded and became the National Open School (NOS), an autonomous institution. The NOS was empowered to conduct its own examinations and it became an independent Board.

- **Vision:** Sustainable inclusive learning with universal and flexible access to quality school education and skill development.
- **Mission:**
- Providing relevant, continuity and holistic education up to pre-degree level through Open and Distance Learning System.
- Contributing to the Universalization of school education.
- Catering to the educational needs of the prioritized target groups for equity and social justice.

15.10 ACTIVITIES OF THE NOS FOR THE IMPROVEMENT OF TEACHING-LEARNING

Strategies of NOS

The mission of NOS is to provide relevant, continuing and developmental education to prioritized client groups in response to the assessed needs of the people, through an Open Learning System, at the school stage.

These are an alternative to the formal system and thus make its contributions to -

- Universalization of education;
- Greater equity and justice in society; and
- The evolution of a learning society.

Keeping in view the above objectives an endeavor was made to make the courses in consonance with the needs of potential target groups. The NOS had designed, developed and delivered high quality academic programmes as well as courses in professional areas like Computer Applications, Word Processing and Secretarial Practice.

It offers two types of courses: general educational courses and vocational/life enrichment courses. Open Vocational Education is offered at secondary and senior secondary levels. Life Enrichment and Continuing Education Courses are addressed to general public and those in various areas of work.

The general education courses offered by the NOS include -

- Foundation Course equivalent to grade VIII serving as a bridge course for joining the Secondary level programme;
- Secondary School Course equivalent to class X level;
- Senior Secondary Education Course equivalent to class XII level.

In order to further widen its access, the NOS has launched the following programmes -

- Open Basic Education programme aimed at providing continuing education to the neo-literates in the age group 14+;
- Open Elementary Education for the benefit of the non-school going children in the school going group;

- Rural Community Workshops are being set up for providing vocational education and training in rural areas. Under this Rural Community Workshops scheme financial support will be provided to NGOs to set up workshops for vocational courses in rural areas;
- Open Vocational Education Programme which can be combined with academics, skill-based Certificate Courses of short and long-term duration, Special Professional Certificate/Diploma Courses, Stand-alone vocational subjects, Life Enrichment Courses with vocational approaches etc.;
- Emerging areas, namely, Early Childhood Care and Education, Ophthalmology, Geriatrics, Pre-coaching for SC/ST etc.

NOS is providing a number of Vocational, Life Enrichment and community oriented courses besides General and Academic Courses at Secondary and Senior Secondary level.

It also offers Elementary level Courses through its Open Basic Education Programmes (OBE). Government of India through a gazette notification vested NOS with the authority to examine and certify learners registered with it up to pre degree level courses whether Academic, Technical or Vocational.

NOS are committed to provide Excellent, Sustainable, Inclusive and Flexible Education up to Pre-degree level through Open and Distance Learning (ODL) mode and Compliance of requirements to ensure satisfaction of learners and continual improvement of our Quality Management System.

15.11 STATE ET CELLS (STATE EDUCATIONAL TECHNOLOGY CELLS)

In 1970, the Ministry of Education took up a scheme of ET. Under this scheme, an ET unit in the Ministry, a Centre for Educational Technology (CET) under NCERT, and ET cells in six SITE states were set up in 1974. (There was a lot of time lag in thought and deed.)

Educational Technology Cell was established in 2003. This cell was

primarily conceived to produce high quality Video/Web/Multimedia based instructional material; syllabus based content development for the National Programme on Technology Enhanced Learning (NPTEL) project. Over the period of time, its role has been expanded to absorb new paradigms of e-learning, training of faculty to develop their own e-content and to use e-contents developed by NPTEL, training of faculty from other institutes to facilitate streaming of video and web based lectures in their respective institutes, streaming of video lectures round the clock on demand, at IIT Roorkee, creation of question banks and quality control of e-content generation through feedback mechanism. The cell has state-of-the-art digital video cameras, non-linear editing systems, audio and video systems, teaching aids, substantial number of computers, servers and soft wares required to produce high quality Web based and Video based courses and 3D-animation. This Centre is also connected to satellite through EDUSAT (a facility provided by ISRO).

The Institute has a well-equipped Educational Technology cell (E T Cell) to lend relevant technological support to the ongoing instructional activities as well as the in-service education programmes. It has a rich library of educational films, film-strips, video recording and audio cassettes besides the requisite hardware. There is TV viewing room to watch telecasts / video playbacks of educational programmes. Educational Technology is a course component of the pre-service teacher education programmes of the Institute.

The ET Cell has a modern audio studio with a spacious recording room and other production facilities. The studio is required with 3 console tape recorders, an 8 channel mixer unit and a mobile tape recorder for outdoor recording. The functions of the audio studio are -

- To provide audio resource support to the pre and in-service training programmes of the college.
- To train educational functionaries in educational technology with a view to developing technical manpower, and
- To develop prototype audio educational software for wider dissemination in school and training establishments.

The E T Cell has developed more than 400 audio programmes in the areas of language teaching value education, child psychology, astronomy, guidance and counseling, etc., for use by students, teacher and teacher trainers. The Cell undertakes collaborative projects with the states in the region for curriculum based audio cassettes which are subsequently distributed to the beneficiaries by the states.

15.12 ACTIVITIES OF THE STATE ET CELLS FOR THE IMPROVEMENT OF TEACHING - LEARNING

At the state level we have Educational Technology (ET) Cells located and functioning either under the supervision and administrative control of the SCERTs/SIES of respective states/union territories or established to function independently in the name of State Institute of Educational Technology (SIETs). SIET represents the type of institutions (functioning at present in seven states) supposed to carry out the similar functions as performed by CIET at the center.

The States ET Cells are usually expected to discharge the functions like -

- Produce educational video and audio programmes,
- Design, develop and disseminate teaching-learning material,
- Conduct training and orientation programmes, etc.

15.13 AVRC (AUDIO VISUAL RESEARCH CENTRE)

In 1984 University Grants Commission (UGC), New Delhi has launched Country Wide Class Room (CWCR) and production facilities at 6 Universities in India through establishing media centers in the name of Audio Visual Research Centers (AVRCs). Later these centers have been renamed as Educational Multimedia Research Centers.

The Audio-Visual Resource centre for the School for Studies in Art and Culture (SSAC) in the faculty of Arts and Social Sciences (FASS) at Carleton University (CU) in Ottawa, Ontario, Canada. The AVRC serves the combined faculties of Art, History, Music and Film at CU.

This was mainly to use electronic media for the quality enrichment of higher education. In 1996- 97, the centre produced 16 educational programmes covering various aspects like earth science, ecology, maths, chemistry, social science, etc. The centre also undertakes research in all aspects of educational technology in relation to learning for both urban and rural college.

Objectives:

The audio-visual resource centre has the following objectives -

- To map the audience profile in terms of demographic, socioeconomic and educational background along with their media habitats.
- To examine whether it helps the teachers in higher education by enabling them to teach more effectively.

15.14 ACTIVITIES OF THE AVRC FOR THE IMPROVEMENT OF TEACHING - LEARNING

The audio-visual resource centre has the following activities -

- Circulation of reserve material for courses at the second-year level and above students may consult these materials on two-hour loan arrangement.
- Online searching of the school's teaching and reference collections, including a digital image collection. Requests for items or patron accounts may be made in person or via email avrc @carleton.ca.
- Assistance in locating analogue or digital material or in creating presentations or rescreening a film-we're here to help.

15.15 EMRC (EDUCATIONAL MULTIMEDIA RESEARCH CENTRE)

Educational Multimedia Research Centre (EMRC) was established as audio visual research centre in 1989 by the UGC at Panjab University, Patiyala under the country wide class room project. The centre is presently funded by the UGC and MHRD for producing enrichment educational video

lecture and e-content programmes. The centre is equipped with a large state of the art studio with chroma facility latest technology broadcasting equipment and high powered multimedia workstation to produce educational video content.

Mission:

To generate, disseminate and preserve knowledge and also prepare the next generation of thinking media professionals by providing diverse learning environments.

15.16 ACTIVITIES OF THE EMRC FOR THE IMPROVEMENT OF TEACHING - LEARNING

The activities of EMRC are -

- Production of educational programmes and related support material and setting up of appropriate facilities for this.
- Research related to optimizing the effectiveness of the programmes.
- Providing a forum or the active involvement of academic and other scholars in the creation of appropriate educational programme.
- Studying promoting and experimenting with new techniques/ technology that will increase the research and effectiveness of educational communication.



CHECK YOUR PROGRESS

Q 1: Write the full form of CIET.

.....

Q 2: In which year UGC was estabilised?

.....

Q 3: Mention one activity of IGNOU?

.....

Q 4: What is the vision of NOS?

.....

Q 5: What is State ET Cell?

.....

Q 6: Write one objective of AVRC?

.....

Q 7: What is the full form of EMRC?

.....

Q 8: From where NIST received grants?

.....

15.17 NIST (NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY)

The National Institute of Science and Technology (NIST) was established in 1996 and is being managed by the SM Charitable Educational Trust under the vision and guidance of its renowned philanthropist and educationist Chairman, Sri Surendra Mudali. The Institute is approved by the All India Council for Technical Education (AICTE under MHRD, Govt of India) and is affiliated to the Biju Patnaik University of Technology (BPUT). The Institute campus of 60 acres is located at the picturesque Palur Hills about 12 km from Berhampur and 3 hours drive from Bhubaneswar.

The Institute has grown by leaps and bounds under the table leadership of its founder Director, Prof. Sangram Mudali, Director (M.S., University of Houston, B. Tech., IIT Kanpur), Prof. (Mrs.) Geetika Mudali, Placement Director, M.S.(MIS), New Jersey Institute of Technology, NJ) and Prof. Ajit Kumar Panda, Principal, (Boyscast Scholar at University of Michigan, USA). Within a short span of 17 years, it has produced 4 BOYSCAST faculty scholars who have been funded by Government of India to pursue postgraduate research in the top Institutes in USA and Germany. NIST has produced 3 Full Bright Scholars. Three of its faculty has won the Samant Chandrasekhar Young Scientist Award given by the Government of Orissa. Two AICTE funded Emeritus Professors worked at NIST. The

faculty of the Institute has been awarded 3 URSI Young Scientist Awards. More than 25 Post doctorate scholarships have been awarded to the Institute faculty. The faculties of the Institute are alumni of IIT's, IISc, ISI, Jadavpur University and Calcutta University etc. More than 35 faculty of the Institute are from the IITs alone which is a testimony to its ability to attract and retain top-notch faculty. The faculties of the Institute have published more than 250 journal papers in refereed journals and are authors of about 24 books published by reputed publishing houses. The Institute also has its own publishing house "NIST Press". The Institute has received a number of grants, projects, special funding, travel funding, SDPs, FIST grant, scholarships, etc., from the DST, CSIR, AICTE, IT companies, etc.

- NIST has been ranked #28 in India by DataQuest - CMRSurvey Report 2013-2014.
- NAAC has Accredited NIST with Grade A with a high score of 3.22
- 69th All-India Rank by NIRF, MHRD, Govt. of India, 2016
- NIST has been ranked #2 in eastern India and #13 in India by DataQuest - 2016.
- 66th All India Rank by OUTLOOK 2016.
- BPUT (Affiliating University) Students have ranked NIST as No.1 Engineering Institute among 100+ engineering institutes of Odisha through public voting.
- NIST has bagged with the prestigious eINDIA 2013 Award at an event held in Hyderabad on July, 23 under the category of "Best Teaching Learning Institute".
- NIST has once again proved its credentials in bagging the "Best Technical Institute in R and D Activities" in the State of Odisha. The Award was received by NIST at a glittering ceremony in Jaydev Bhavan, Bhubaneswar on the eve of Engineers' Day-2013.

NIST is a considered as a benchmark research institution in eastern India. The Institute has recently signed MoU for research collaboration in the field of nano sciences, communications, semiconductor technology with the National Taiwan University and University of Electro Communications, Japan. NIST has signed MoU with industries like

Sandhur and Sun Moksha for collaborative work in the area of nano technology and renewal energy. NIST, in association with IIT, Khargapur, is also part of the MHRD Virtual Laboratory project.

Over the past 22 years, NIST has raised manifold. Today, NIST has been ranked 69th in the entire country in engineering based National Institutional Ranking Framework (NIRF), MHRD, Government of India and it is the 2nd best engineering college in eastern India and 14th best in India by Data Quest survey 2017, 65th Best College in India by OUTLOOK, 2016 and has been ranked as No. 1 Private Engineering College in the state of Odisha by BPUT students. It has been accredited by NAAC as Grade A college with 3.22 CGPA which is highest in the state. Sprawling over 65 acres of lush green campus, the college is now home to 4000 students, 250 faculty members. NIST is a DSIR, Government of India, certified and recognized R and D center. NIST is the only TIFAC CORE Center of India funded by DST in 3G/4G communication technologies.

Since its inception the institute has grown manifolds, and today students from over 13 states are studying here. There are high standard labs with high-tech equipment. NPTEL course water is used to enhance the teaching and learning process. NPTEL is from the IITs/IISc and are used by all faculty and students. All in all, NIST is a highly advanced institution in keeping with the times.

The ultimate goal of any plan for educational technology should reflect two intentions, equitable access to technology for all students and educators and comparable levels of educational technology for all schools. In setting up on educational technology resources centre three aspects have to be addressed. Determination of the equipment required hardware and software, securing require founds so as to cover initial costs such as maintenance and technical assistance providing professional development for educators. So that technology is utilized and implemented meaningfully. Thus, technology can become the force that equalizes educational opportunities of all children regardless of location and social and economical factors.

Mission

"To create an Educational Institute for nurturing Quality Engineers and Managers for growth of Indian Industries, to develop Entrepreneurs and to pursue Innovative Research on Emerging Technologies for the Future Generation."

Vision

"Create engineering minds capable of mastering the global challenges of tomorrow's technology".

15.18 ACTIVITIES OF THE NIST FOR THE IMPROVEMENT OF TEACHING - LEARNING

The activities of NIST are -

- **Technical Activities:** SANKALP is a national-level techno-management symposium organized by the National Institute of Science and Technology, Berhampur, with an aim to nurture the technical expertise and skills among youngsters. The two-day event provides a unique platform to showcase their talents fueling their innovations in all myriad forms so that they can defy the odds to achieve the pinnacle of fame and glory. Two days of extravaganza presents a plethora of events including Robotics, Web Designing, Quizzes, Coding, Paper Presentation and many more. This enthralling techno-fiesta gives a chance to students to explore and conquer the vast realm of new horizon, redefining the meaning of success itself.

Carrying the legacy forward 'Sankalp 2016' through various technical, management, and fun events tested the caliber of the enthusiastic participants from NIST and different colleges of the state. It included Invited Talks, Panel Discussions, RC Aircraft Modeling Workshop, Technical events and contests, and fun events like Star Nite and Cultural Evening. The Invited Talks included engaging talks by eminent personalities like Arvind Tiwary on the topic "opportunities for startup-story of india's silicon valley"; Piyush Agarwal,CEO,

dabbawalaassociation,Mumbai. A panel discussion was conducted on the topic "India's Demography:Dividend or Disaster" on the 1st day of the programme. Mr.Priya Ranjan Sahu, Former Chief Editor Hindustan Times, Mr.Sudhir Patnaik Editor.

This was the 13th version of the original theme since its inception in the year 2003. Since then, the voyage has been propelled with the true spirit of team work, cooperation, coordination and determination which was catalyzed by the motivation and inspiration of our esteemed Director, Prof. Sangram Mudali and Placement Director, Prof. (Mrs.) Geetika Mudali.

- **Cultural Activities:** The institute organizes its Annual Cultural Fest. Both students and faculty challenge and stretch their extracurricular talents to the extreme. The celebrations start with a series of games and sports events like Basketball, Volleyball, Football, Swimming, Lawn Tennis, Throw Ball and many more. The evening splash with the spirit of enjoyment as students as well as faculty members took to the stage showcasing their singing, dancing and acting talents. The second day dedicates to various stage events like Antakshari, Dumb Charades, Debate and Skits. The skits range from Modern Ramayana to Students' Life and several other interesting and nerve tickling experiences. During the fest the Gold and Silver medalists are also felicitate and the deserving students are offered scholarships by the respective sponsoring faculty and staff in the presence of Prof. Sangram Mudali and Prof. Geetika Mudali. The Fashion Show marked the end of the eventful evening.
  - 11th Anniversary Celebration of NIST e-new
  - 15 Glorious Years Celebration
  - Independence Day and Republic Day celebration
- **Co-curricular Activities**
  - Blood Donation camp
  - NISTians raft Mahanadi
  - Orientation day for 1st year students
  - Orientation Program on Basics for Freshers

- A Mini-Trekking Expedition
- Industrial Tour of Management Students
- National Himalayan Trekking Expedition
- Parasailing

- **Club Activities**
  - Movie making competition
  - Summer robotics workshop
  - Eyebotics
  - Astronomy week
  - Sand art competition
  - Technical clubs
  - Cultural clubs
  - Health and sports clubs
  - Language clubs
- **Sports Activities**

  NIST students come out with flying colors in different sporting events.



ACTIVITY 15.1

- Write from your own words -
- How is technology going to help the students in the classroom?
- Does the technology encourage broader community participation?



15.19 LET US SUM UP

- Central Institute of Educational Technology, a constituent unit of NCERT, came into existence in the year 1984 with the merger of Centre for Educational Technology and Department of Teaching Aids. It aims at bringing about improvement of education through various kinds of educational technologies.
- Major activities of CIET are planning the T.V. Curriculum, training script-writers, producers, researchers and technical staff, production

of educational programmes and research. So CIET has been playing a pivotal role in implementing various innovative projects in educational technology both at National and State levels.

- The University Grants Commission (UGC) was set up in 1956 for coordination and determination of standards. UGC has taken steps to implement the recommendations of New Policy on Education such as establishment of Autonomous Colleges, Centers of Advanced Studies in Universities, resurrecting of courses, regular use of media for higher education, establishment of Education Media Research Centers and Audio Visual Research Centers for the use of media and setting up of Academic Staff Colleges for training and orientation of college teachers.
- The UGC controls the following in India - maintaining the standard of research, teaching and examination in the universities, promoting university education, making regulations to maintain the minimum standard of education in the country, it is a link between the union government and the institutes of higher education, it also advises the government about the steps to be taken in order to improve the education system.
- IGNOU was established in September 1985 with the aim of widening access of higher education to larger segments of the population, organizing programmes of continuing education and initiating special programmes of higher education for specific target groups like women, people living in backward areas, etc. IGNOU introduced its programmes in 1987.
- The activities of IGNOU are - the University has made a significant mark in the areas of higher education, community education and continual professional development, it has been networking with reputed public institutions and private enterprises for enhancing the educational opportunities being offered by it, as a world leader in distance education, it has been conferred with awards of excellence by the Commonwealth of Learning (COL), Canada, several times, it is committed to quality in teaching, research, training and extension

activities, and acts as a national resource centre for expertise and infrastructure in the ODL system, it has established the Centre for Extension Education, National Centre for Disability Studies and National Centre for Innovation in Distance Education, to focus on specific learner groups and enrich the distance learning system, emphasis is now being laid on developing interactive multimedia and online learning, and adding value to the traditional distance education delivery mode with modern technology-enabled education within the framework of blended learning, free of cost education is being provided to all jail inmates across the country, a large number of SC/ST students have been admitted to various programmes of the University.

- In 1979, the Open School was set up as a project of the Central Board of Secondary Education, Delhi. The Open School was not an examining body at that time and its examinations were conducted by the CBSE. In November 1989, the Open School was upgraded and became the National Open School (NOS), an autonomous institution. The NOS was empowered to conduct its own examinations and it became an independent Board.
- The mission of NOS is to provide relevant, continuing and developmental education to prioritized client groups in response to the assessed needs of the people, through an Open Learning System, at the school stage.
- Educational Technology Cell was established in 2003. This cell was primarily conceived to produce high quality Video/Web/Multimedia based instructional material; syllabus based content development for the National Programme on Technology Enhanced Learning (NPTEL) project.
- The States ET Cells are usually expected to discharge the functions like - produce educational video and audio programmes, design, develop and disseminate teaching-learning material, conduct training and orientation programmes, etc.

- In 1984 University Grants Commission (UGC), New Delhi has launched Country Wide Class Room (CWCR) and production facilities at 6 Universities in India through establishing media centers in the name of Audio Visual Research Centers (AVRCs). Later these centers have been renamed as Educational Multimedia Research Centers.
- The audio-visual resource centre has the activities like - circulation of reserve material for courses at the second-year level and above students may consult these materials on two-hour loan arrangement, online searching of the school's teaching and reference collections, including a digital image collection, requests for items or patron accounts may be made in person or via email avrc @carleton.ca., assistance in locating analogue or digital material or in creating presentations or rescreening a film-we're here to help.
- Educational Multimedia Research Centre (EMRC) was established as audio visual research centre in 1989 by the UGC at Panjab University, Patiyala under the country wide class room project. The centre is presently funded by the UGC and MHRD for producing enrichment educational video lecture and e-content programmes.
- The activities of EMRC are - production of educational programmes and related support material and setting up of appropriate facilities for this, research related to optimizing the effectiveness of the programmes, providing a forum or the active involvement of academic and other scholars in the creation of appropriate educational programme, studying promoting and experimenting with new techniques/technology that will increase the research and effectiveness of educational communication.
- The National Institute of Science and Technology (NIST) was established in 1996 and is being managed by the SM Charitable Educational Trust under the vision and guidance of its renowned philanthropist and educationist Chairman, Sri Surendra Mudali. The Institute is approved by the All India Council for Technical Education (AICTE under MHRD, Govt of India) and is affiliated to the Biju Patnaik University of Technology (BPUT).

- The activities of NIST are - Technical Activities, Cultural Activities, Co-curricular Activities, Club Activities and Sports Activities.

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15.21 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Central Institute of Educational Technology.

Ans to Q No 2: 1956.

Ans to Q No 3: Promoting university education.

Ans to Q No 4: Sustainable inclusive learning with universal and flexible access to quality school education and skill development.

Ans to Q No 5: State ET Cell was primarily conceived to produce high quality Video/Web/Multimedia based instructional material; syllabus based content development for the National Programme on Technology Enhanced Learning (NPTEL) project.

Ans to Q No 6: To map the audience profile in terms of demographic, socioeconomic and educational background along with their media habitats.

Ans to Q No 7: Educational Multimedia Research Centre

Ans to Q No 8: NIST has received a number of grants from the DST, CSIR, AICTE, IT companies, etc.

15.22 MODEL QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: What is the role of CIET?

Q 2: What is the vision of IGNOU?

Q 3: What are the activities of NIST?

Long Questions. (Answer each question in around 300-500 words)

Q 1: "The motto of UGC is Gyan-Vigyan Vimutaye"- discuss the statement.

Q 2: Write briefly about NOS.

Q 3: Discuss the role of State ET Cells.

Q 4: Discuss the activities of AVRC and EMRC.

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