CENTRE FOR DISTANCE & ONLINE EDUCATION

UNIVERSITY OF JAMMU
JAMMU

SELF LEARNING MATERIAL
For
M.A. EDUCATION
SEMESTER-III

Subject : Educational Technology	**Unit : I – IV**
Course No. : 301	**Lesson No. : 1 – 15**

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MASTER'S DEGREE PROGRAMME IN EDUCATION (M.A. EDUCATION)

CHOICE BASED CREDIT SYSTEM
SEMESTER III

Syllabus for the Examinations to be held in December 2024, 2025 and 2026

Course No. PSEDTC301   **Title: Educational Technology**
Credits: 4

Maximum Marks:	**100**
Minor Test-I:	**10**
Minor Test-II:	**10**
Internal Assessment Assignment	**10**
Major Test :	**70**

Learning Outcomes:

1. Students will understand the meaning, nature, scope and significance of Educational Technology and its Components in terms of Hardware and Software.

2. Students will understand the difference between Communication and Instruction so that they can develop and design a sound instructional system.

3. Students will be acquainted with the levels, strategies and models of teaching for future improvement.

4. Students will understand programmed learning and analyse its types.

5. Students will be acquainted with the models and trends in Educational Technology.

Course Contents:

Educational Technology-concept and scope

Unit-I

Components of Educational Technology – Hardware and Software System approach in educational technology, and its characteristics Multi-media & Mass media approaches in educational technology

Relationship of the term teaching with other similar concepts such as conditioning, instruction, training and indoctrination

Instructional Technology: concept, importance and implications, difference between educational and instructional technology

Communication and Instruction: concept, nature, principles, modes, facilitators and barriers of communication process, classroom communication (Interaction – verbal and non-verbal)

Unit-II

Designing Instructional System – formulation, task analysis, designing of instructional strategies such as lecture, team teaching, discussion, seminar and tutorials (concept and importance)

Programmed Learning – concept, origin, basic structure of Linear (Extrinsic) and Branching (Intrinsic) styles of programming, various steps involved in construction of programmes

Computer Assisted Learning (CAL) and Computer Managed Learning (CML) – concept, process, merit and dem

Unit-III

Teaching Strategies - Meaning, Nature, Functions and Types of the following Models of Teaching:

- Concept Attainment Model

- Inquiry Training Model

- Glaser's

Basic Teaching Model Modification of teaching behavior :
- Microteaching: concept; importance, different teaching skills, microteaching cycle, advantages and limitations

- Flanders Interaction analysis and Simulation: nature, procedure, advantages and limitations

Unit-IV

Distance Education: Concept – Different contemporary System viz., Correspondence, Distance and Open, Student Support Services, Counselling Methods in Distance Education, Evaluation strategies in Distance Education, use of ICT in Distance Education, IGNOU an open learning system

Emerging trends in Educational Technology – Role of Videotape, Radio-television, Tele-conferencing, CCTV, EDUSAT, e-learning, Virtual Class Room Composition and Role of Resource Centres for Educational Technology – CES (UGC) CIET, AVRC, EMRC, INTEL

Mode of Transaction: *Lecture-cum-practical exposure*

Note for paper setting:

There shall be two tests & one Assignment as part of Minor Evaluation & one major test at the end of semester in each semester. The students shall be continuously evaluated during the conduct of each course on the basis of their performance as follows:

Thory	Syllabus to be covered in the examination	Time allotted for the examination	% weightage (marks)
Minor Test-I	Unit I & Unit II	Sixty Minutes	10 Marks
Minor Test-II	Unit III & Unit IV	Sixty Minutes	10 Marks
IAA			10 Mark (two questions of 5 marks each)
Major Test	Unit I to IV	Three Hours	70 Marks

Essential Readings:

1. Allen, D. & Tyen, K. (1969)   Micro-Teaching, Addison-Wesley.

2. Chauhan, S.S. (1978)   Text-Book of Programmed Instruction, New Delhi: Sterling Pub. Co

3. Flanders, Ne, A. (1970)   Analyzing Teaching Behavior, Addison-Wesley Pub. Co

4. Groundlund, Norman E. (1970)   Stating Behaviour-1 Objectives for Classroom Instruction, MacMillon Co.

5. Mager, Robert F. (1965)   Preparing Instructional Objectives Fearon Publishers.

6. Markle, Susan M. (1969)   Good Frames and Bad – A Grammer of Frame Writing – John Wiley and Sons.

Suggested Readings:

1. Pipe, Peter (1965)   Practical Programming, Holt, Rainohard & Winster.

2. Passi, B.K. (1976)   Becoming Better Teacher-Micro Teaching Mudranalyan.

3. Pandey, K.P.(1980)   A first course In Instructional Technology. Gaziabad, Amitash Prakashan.

Note for Paper Setters (Major Test):

The question paper will contain long and short answer type questions. There will be total of eight long answer type questions (two questions from each unit with internal choice) and the candidates will be required to answer one question from each unit. Each long answer type question will carry 15 marks. Question No. 1 will be compulsory and shall have 04 short answer type questions (100 words per question). Short answer type questions will be from all the units. Each short answer type question will carry 2.5 marks.

M.A. EDUCATION
COURSE NO. PSEDTC 301
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LESSON 1

EDUCATIONAL TECHNOLOGY: CONCEPT AND SCOPE

Structure

1.1 INTRODUCTION

Technology enhances teaching effectiveness and has significantly impacted education at various levels. It enables institutions worldwide to offer courses through interactive TV, computer conferencing, the Internet, and other modern media, expanding access to learning. As distance education grows, educators must familiarize themselves with technological tools to optimize instruction. While some teachers embrace innovative methods, others rely on traditional approaches. Over time, diverse techniques, methods, and equipment have been developed to enhance learning. Educational technology encompasses the scientific development and application of these tools, making teaching more efficient. This chapter explores its definition, scope, various forms and components of Educational technology.

1.2. LEARNING OBJECTIVES

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

✠ Discuss the concept of educational technology

✠ Explain the nature of educational technology

✠ Analyse the components of educational technology

✠ Evaluate the multimedia and mass-media approach in educational technology

✠ Evaluate the role and significance of educational technology

1.3. MEANING AND DEFINITION OF EDUCATIONAL TECHNOLOGY

The 21st century has been named as the 'age of knowledge' and there is no way in which one can deny the role of technology in different aspects of our lives. Like other fields, education too has been deeply impacted by technological revolution. This interface of education and technology is popularly known as educational technology. Some associate the term 'educational technology' solely with technical equipment and media of education, such as overhead projectors, television, and computers. There are others who believe that educational technology involves a scientific and systematic analysis of the teaching—learning process with an objective to maximize its effectiveness.

Before going further, it is essential to understand the word 'technology'. This word is taken from the Greek word *technología,* which means an art and is related to skill and dexterity.

Generally, the term 'technology' denotes the systematic application of the knowledge of sciences to practical tasks in industry. Technology can refer to material objects like machinery or hardware and also comprise more themes, including systems, methods of organization and techniques.

In context of educational technology, D. Randy Garrison (1989) opines: 'Technology will be viewed here

as having both, a process (software) and a product (hardware) component, where process is the creative application of knowledge of purposeful activities. A subset of hardware is media, where media are the devices used to distribute information'. Thus, educational technology is a wider concept of the word 'technology'. Further, it will be wrong to confuse the term 'teaching' with the process of teaching or instructing, or educating, or provision of knowledge or engineering. This creation of education does not compromise and has very positive future prospects. For all those who are constantly engaged in the pursuit of knowledge otherwise, it will remain destructive to the welfare of free society.

A large number of different groups and individuals have defined 'educational technology' in many ways, over a period of time. A few of the notable definitions are as follows:

- According to Finn (1962), 'educational technology is a process, an attitude, a way of thinking about certain classes of problems.'

- The National Council for Educational Technology (1967) has defined educational technology as 'the development, application and evaluation of systems, techniques and aids to improve the process of human learning'.

- According to G. O. M. Leith, 'Educational technology is the application of scientific knowledge and learning and the conditions of learning, to improve the effectiveness and efficiency of teaching and training. In the absence of scientifically established principles, educational technology implements the techniques of empirical testing to improve learning situation'.

- According to S. S. Kulkarni, '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 the Association for Educational Communication and Technology, AECT (1977), 'educational technology is a complex and integrated process, involving people, procedures, ideas, devices and organization, for analysing problems and devising, implementing, evaluating and managing solutions to those problems, involved in all aspects of human learning'.

1.4. NATURE OF EDUCATIONAL TECHNOLOGY

Educational technology is a structured and integrated process that involves people, procedures, ideas, devices, and organizations to analyze educational challenges and develop, implement, evaluate, and manage effective solutions. Key aspects of its nature include:

1. It is the systematic application of scientific knowledge to education.

2. It is a complex and integrated process that combines various elements, including people, procedures, ideas, devices, and organizations.

3. It focuses on analyzing educational challenges and devising, implementing, evaluating, and managing appropriate solutions.

4. It is a continuous, dynamic, and evolving process that adapts to new concepts and innovations.

5. As an interdisciplinary field, it draws insights from psychology, education, computer science, and engineering.

6. It enhances teaching and learning by evaluating instructional environments, learning materials, and learner needs to implement effective solutions.

7. It utilizes various tools and techniques such as instructional design, multimedia, and learning management systems to create and assess educational solutions.

8. It requires educators to understand both the advantages and limitations of technology and actively engage in professional networking with peers at national and global levels.

In summary, educational technology is a multidisciplinary and evolving field that applies scientific knowledge to education. It continuously seeks to improve teaching and learning through innovative tools, methods, and strategies.

1.5 TYPES OF EDUCATIONAL TECHNOLOGY

Educational technology, as previously discussed, has a broad scope and diverse applications in education. It involves applying scientific, technological, psychological, and pedagogical principles and techniques to teaching and learning. This integration enhances both theoretical and practical approaches to improving educational processes and outcomes in formal and informal settings. The key forms of educational technology include:

1. Teaching technology

2. Instructional technology

3. Behavioral technology

1.5.1. Teaching Technology

Teaching is a skill, and the integration of technology simplifies, refines, and enhances its effectiveness, making it more structured and impartial. This aspect of educational technology is grounded in philosophy, psychology, and science to achieve specific learning objectives. Teaching comprises two key elements: (i) content and (ii) classroom communication, both of which rely on substance and interaction. Modern teaching prioritizes the learner over the teacher, necessitating a psychological understanding of students. As a result, teaching is both a scientific and psychological process. A well-structured learning system supports teachers in making informed decisions while fostering professionalism and accountability. It also brings essential advancements in teaching methodologies, teacher training, policy formulation, and classroom management. Teaching technology, as a branch of educational technology, focuses on making the teaching process more systematic and effective.

1.5.2. Instructional Technology

Instructional technology is designed to assist both instructors and learners in achieving specific instructional objectives within a given teaching-learning context. The term "instructional" refers to a structured approach aimed at acquiring particular information, knowledge, or understanding about a subject, system, or process. In this regard, instructional technology focuses on planning the appropriate type of instruction and instructional materials needed for a specific learning environment. It also recommends effective strategies for utilizing these materials to achieve the intended learning outcomes.

Defined as a subsystem of educational technology, instructional technology supports both educators and self-directed learners by determining the most suitable media, methods, and materials required to fulfill instructional objectives in a structured learning scenario.

1.5.3. Behavioural technology

Behavioral technology, in its broadest sense, is used to study and modify the behavior of living organisms. While it may encompass behavior modification strategies beyond learning principles, its primary application in educational settings involves behavioral analysis and modification based on operant conditioning (reinforcing desired behavior) and observational learning (imitating model behavior). It plays a crucial role in analyzing individuals' behavior by identifying specific, observable actions such as daydreaming, gossiping, or reactions to situations. Once behavior is assessed, behavioral technology helps define and establish target behaviors in clear, measurable terms. This structured approach ensures that behavior modification is conducted scientifically, making it purposeful and goal-oriented.

1.6 COMPONENTS OF EDUCATIONAL TECHNOLOGY

Educational Technology has a broad scope and significant applicability in education, providing essential tools and methods to enhance teaching and learning processes. It encourages educators to explore innovative and effective ways of structuring instructional activities. Educational technology encompasses various dimensions, including teaching technology, instructional technology, behavioral technology, and instructional design technology. Based on its conceptual foundations, it is recognized as a "multi-faceted concept" (Mangal & Mangal, 2017), consisting of multiple components that can be understood through different approaches.

Humbsdaine (1964) identified three distinct approaches to educational technology:

1. Educational Technology I – Hardware Approach 2. Educational Technology II – Software Approach 3. Educational Technology III – Systems Approach

Here, hardware and software components will be discussed elaborately.

1.6.1 Hardware Approach

The **Hardware Approach** to educational technology originates from physical sciences and engineering, focusing on utilizing technological tools in education. This approach is productoriented, emphasizing the
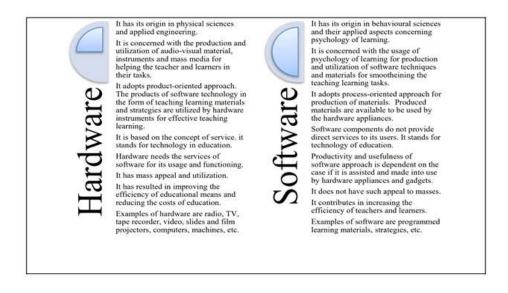
creation and use of audio-visual aids such as charts, models, slides, film strips, audio cassettes, and advanced equipment like radio, TV, projectors, video recorders, teaching machines, and computers (Mangal & Mangal, 2017). It highlights the importance of integrating these devices into teaching-learning processes to enhance instructional delivery. Additionally, it plays a significant role in advancing mass media, making education more accessible and cost-effective for a larger audience (Mangal & Mangal, 2017). Ruhela defines this approach as the use of tools and hardware such as teaching machines, TVs, and tape recorders in instruction, while **Silverman** refers to it as "relative technology," emphasizing the adaptation of machines and devices to education. This approach allows teachers to reach larger groups of students effectively and relies on software technology for content and instructional materials.

1.6.2 Software Approach

The Software Approach to educational technology is rooted in behavioral sciences and focuses on the psychology of learning to enhance the teaching-learning process. Unlike the hardware approach, which emphasizes tools and devices, the software approach is process-oriented, concentrating on the development of instructional strategies, learning materials, and teaching techniques. It applies learning principles to shape and direct student behavior, ensuring that educational objectives are met effectively. This approach involves designing curriculum content, programmed instruction, and multimedia-based learning resources to optimize learning experiences. Often referred to as instructional technology, teaching technology, or behavioral technology, it helps in structuring lessons, selecting appropriate teaching methods, and improving learner engagement. Silverman describes it as "constructive educational technology," highlighting its role in analyzing, selecting, and developing necessary elements to meet students' educational needs. By leveraging educational theories and instructional design models, the software approach enhances the effectiveness of teaching and ensures personalized, systematic, and goal-oriented learning experiences.

Distinction between Hardware and Software Components

These two approaches to educational technology are different in several areas which are described in the following manner:

It has its origin in physical sciences and applied engineering.

It is concerned with the production and utilization of audio-visual material, instruments and mass media for helping the teacher and learners in their tasks.

It adopts product-oriented approach. The products of software technology in the form of teaching learning materials and strategies are utilized by hardware instruments for effective teaching learning.

It is based on the concept of service. it stands for technology in education.

Hardware needs the services of software for its usage and functioning.

It has mass appeal and utilization.

It has resulted in improving the efficiency of educational means and reducing the costs of education.

Examples of hardware are radio, TV, tape recorder, video, slides and film projectors, computers, machines, etc.

It has its origin in behavioural sciences and their applied aspects concerning psychology of learning.

It is concerned with the usage of psychology of learning for production and utilization of software techniques and materials for smootheining the teaching learning tasks.

It adopts process-oriented approach for production of materials. Produced materials are available to be used by the hardware appliances.

Software components do not provide direct services to its users. It stands for technology of education.

Productivity and usefulness of software approach is dependent on the case if it is assisted and made into use by hardware appliances and gadgets.

It does not have such appeal to masses.

It contributes in increasing the efficiency of teachers and learners.

Examples of software are programmed learning materials, strategies, etc.

On the basis of these points, it can be said that both approaches are different in nature but are complementary to each other. One's presence is necessary for functioning as well as for proper and judicious utilization of another one to make educational practices and teaching learning processes effective and productive.

Role of Components of the Educational Technology in the Educational Practices Technology, as a Systematic organization of knowledge for practical applications, plays a crucial role in enhancing the teaching-learning process. Educational technology improves instructional practices through its key components, including software and hardware technologies.

- ✞ The role of these components in educational practices can be outlined as follows:

- ✞ It facilitates individualized instruction and personalized learning, catering to the unique needs, interests, pace, and abilities of each learner.

- ✞ It employs a multi-media and multi-sensory approach to teaching and learning, grounded in psychological principles of learning.

- ✞ It enhances the management of educational practices by ensuring effective planning, systematic organization, efficient leadership, and proper control of instructional processes.

- ✞ It provides high-quality instructional inputs, including materials, equipment, and appliances, along with effective teaching methods, strategies, and tools, ensuring optimal learning outcomes in a cost-efficient manner.

- ✞ It supports distance and correspondence education, making learning more accessible to students regardless of their geographical location.

- ✞ It transforms teaching and learning into a more engaging, productive, meaningful, and goal-oriented experience.

1.6.3 Systems Approach

This form of educational technology is closely linked to the concept of systems engineering, which originated in computer science. It represents a modern approach to education, emphasizing a systematic method for designing, implementing, and evaluating the entire educational process based on specific objectives. The systems approach is used to effectively and efficiently organize the education system while considering educational goals and available human and material resources.

In this approach, education is viewed as a system comprising inputs that undergo a structured process to generate outputs aligned with predefined objectives. It considers the interconnections between various components of the education system and assesses its overall effectiveness within existing constraints. If the system achieves its intended goals, it is sustained; if not, modifications are made by exploring, designing, and implementing alternative strategies to identify the most suitable and feasible solution.

The systems approach requires continuous evaluation of the roles played by individuals, technology, and media in the education system to develop an appropriate instructional design and strategy in line with the specified objectives. As a relatively new concept in educational technology, the systems approach is still in its early stages in India. However, due to its scientific and mathematical foundation, it has significant potential to enhance the organization, management, and development of education, ultimately strengthening education as a structured and effective system for both individual and societal progress.

1.7 MULTIMEDIA AND MASSMEDIA APPROACHES OF EDUCATIONAL TECHNOLOGY

a. Multimedia Approach in Education

The multimedia approach in education integrates multiple forms of media—such as text, images, audio, video, animations, and interactive content—to enhance the teaching-learning process. This method caters to different learning styles and makes education more engaging, interactive, and effective. By combining various sensory experiences, multimedia helps students grasp complex concepts more easily and retain information longer.

For example, in science education, an interactive simulation of a chemical reaction allows students to visualize molecular interactions rather than just reading about them in textbooks. Similarly, in history classes, documentary videos and animated timelines can bring historical events to life, making learning more immersive. Online learning platforms, such as Khan Academy and Coursera, also use multimedia elements like video lectures, quizzes, and discussion forums to support diverse learners worldwide.

b. Mass Media Approach in Education

The mass media approach utilizes communication channels such as television, radio, newspapers, and the internet to disseminate educational content to a broad audience. This approach is particularly effective in reaching learners in remote or underprivileged areas where access to traditional educational resources is limited. Mass media helps in spreading awareness, providing lifelong learning opportunities, and supporting formal and non-formal education systems.

For instance, educational television programs like *National Geographic* and *Discovery Channel* provide valuable content on science, nature, and culture. Radio programs have been widely used in rural education projects, such as India's *Gyan Vani*, which delivers educational broadcasts to students who may not have access to schools. The rise of digital mass media, including educational podcasts and YouTube channels like *TED-Ed*, has further expanded access to knowledge, making education more flexible and inclusive.

Both the multimedia and mass media approaches play a crucial role in modern education by making learning more accessible, engaging, and effective, ensuring that quality education reaches learners regardless of their location or background.

1.8. CHECK YOUR PROGRESS

Q1 Which oneis not a a form of Educational Technology?

    a) Teaching Technology

    b) Instructional Technology

    c) Behavioural Technology

    d) Hardware Technology

Q2 Which one is not the element of multimedia?   a) Text

    b) Charts

    c) Audio-Video

    d) Graphics / animation

1.9 LET US SUM UP

Educational Technology (ET) is an innovative approach that systematically integrates human and non-human resources to enhance teaching and learning. It is goal-oriented, follows a systematic approach, and aims for optimum educational outcomes. ET improves teaching effectiveness, supports distance education through various media, and modernizes the learning process. It encompasses Behavioral, Instructional, and Teaching Technology, contributing to the advancement of education. The scope of ET is broad, benefiting teachers in improving instruction, learners in enhancing their understanding, educationists in structuring educational frameworks, and administrators in organizing and managing educational institutions effectively.

1.10 KEYWORDS/GLOSSARY

Teaching Technology; Behavioural Technology; Instructional Technology; Components of Educational Technology; Mass Media; Multi Media.

1.11 SELF ASSESSMENT QUESTIONS

Q1 Define Systems Approach in Educational Technology.

Q2 How Software approach is different from Hardware Approach?

1.12 SUGGESTED READINGS

✞ Aggarwal, J.C. (2001). Principles, Methods and Techniques of Teaching. Delhi: Vikas. V' Aggarwal, J.C. (2008). Elementary Educational Technology. Delhi: Shipra Publication.

✞ Allison Little John (2003): Refusing Online Resources. A Sustainable Approach to eLearning, Kogan

Page Limited.

✝ Bengalee, Coomi (1986). Introduction to Educational Technology: Innovations in Education. Mumbai: Saith.

✝ Bhatia, K.K. (2001). Foundation of Teaching Learning Process. Ludhiyana: Tandon Publishers.

✝ Bhatt, B. D.,Sharma, S. R.(1992). Educational Technology: Concept and Technique. New Delhi: Kanishka Publg House.

✝ Dahiya, S.S. (2008). Educational Technology: Towards Better Teaches Preference. Delhi: Shirpa Publication.

✝ Das, R. C.(1993). Education Technology: A Basic Text. New Delhi: Sterling.

✝ Rastogi, S.(1998). Educational Technology for Distance Education. Jaipur: Rawat Publication.

✝ Saxena, N. R. Swaroop, Oberoi, S.C.(2004). Essentials of educational technology and management. Meerut: R.Lall Book Depot.

LESSON 2

RELATIONSHIP OF THE TERM TEACHING WITH OTHER SIMILAR CONCEPTS SUCH AS CONDITIONING, TRAINING, INSTRUCTION AND INDOCTRINATION

Structure

2.1 INTRODUCTION

Dear learner, as you are aware that educational technologies have a significant role in the contemporary educational settings. So, in this lesson we will focus on Relationship of the term Teaching with other similar concepts such as Conditioning, Training, Instruction and Indoctrination.

Education is a lifelong process that facilitates the acquisition of knowledge, skills, values, and attitudes necessary for personal and societal growth. It can take various forms, including formal education through schools and universities, informal learning through daily life experiences, and non-formal education in community-based programs. Education is dynamic, adapting to cultural, societal, and technological changes. At the heart of education lies teaching, which is the deliberate act of facilitating learning.This unit will explore teaching and its relationship with related concepts such as conditioning, training, instruction, and indoctrination.

2.2 LEARNING OBJECTIVES

After going through this lesson, you shall be able to:

- ✞ explain teaching in the context of classroom instruction process.
- ✞ discuss different modes of teaching.
- ✞ distinguish teaching with Conditioning, instruction and indoctrination.
- ✞ explain different modes of teaching.

2.3 CONCEPT OF TEACHING

When someone conveys information or skills to another, this action is often referred to as teaching. This conveying may involve sharing experiences or providing information, such as in a lecture. Teaching is seen as both an art and a science. As an art, it emphasizes the creative and innovative abilities of the teacher to cultivate a meaningful learning environment. As a science, it focuses on the logical, systematic, or procedural approaches needed to achieve educational goals effectively.

2.3.1 Definitions

Various educators have presented different interpretations of the teaching concept.

H.C. Morrison (1934): Teaching is an intimate interaction between a more mature personality (teacher) and a less mature one (learner), aimed at advancing the learner's education.

J. Brubacher (1939): Teaching involves arranging and manipulating situations with challenges that learners must overcome, gaining knowledge and skills in the process.

M.M. Hughes (1963): Teaching is defined as interaction, characterized by mutual or reciprocal influence between teachers and learners in the classroom.

N.L. Gage (1963): Teaching is an act of interpersonal influence intended to alter or develop the behavior and abilities of others.

Thomas F. Green (1971): Teaching is a purposeful human action designed to enhance the learner's capacity for effective action.

Philosophical Analysis of Teaching

Teaching is often described as a triangular process involving three interconnected elements: the teacher, the student, and the subject matter. These elements are systematically organized to achieve predetermined educational goals.

From various definitions, it is evident that teaching is primarily the responsibility of the teacher, aimed at fostering the development of the learner. Teaching is recognized as both an art and a science. Teaching emphasizes the creative and imaginative abilities of the teacher to design meaningful and engaging classroom situations, enabling learners to grasp both immediate and long-term educational objectives.Teaching focuses on logical, procedural, and systematic methods to effectively achieve desired outcomes.

The scientific perspective of teaching has given rise to the concept of teaching technology, which integrates systematic approaches with innovative strategies.

1. Teaching is a structured scientific process comprising three major components: content, communication, and feedback.
2. Effective teaching strategies have a positive impact on student learning outcomes.
3. Teaching systems are inherently flexible, allowing modifications and the development of new strategies to improve teaching activities.
4. The desired learning outcomes of students can be achieved through well-constructed teaching environments that guide and support their progress.

Davis and Glaser (1962) proposed four key steps that define the structure of teaching:

1. *Planning for Teaching:* This stage involves analyzing content, identifying objectives, and preparing instructional materials.
2. *Organizing Teaching:* At this step, strategies are outlined to ensure the effective achievement of teaching goals.
3. *Selecting Teaching-Learning Strategies:*Appropriate methods and approaches are chosen to effectively communicate content and support learning.

4. *Managing the Teaching-Learning Process:* This includes assessing student performance in relation to learning objectives and providing feedback to enhance outcomes for both students and teachers.

According to Robertson (1987), teaching is a multifaceted process designed to facilitate learning. The International Encyclopedia of Teaching and Teacher Education categorizes teaching into three primary types:

1. **Teaching as Success:** This view highlights the intrinsic connection between teaching and learning, suggesting that teaching naturally fosters learning.

2. **Teaching as an Intentional Activity:** Teaching is seen as a deliberate effort to achieve desired learning outcomes, even though success is not guaranteed.

3. **Teaching as Normative Behavior:** This involves actions intentionally directed at promoting learning. Activities include training, which develops skills and behaviors, and instruction and indoctrination, which focus on imparting knowledge and shaping beliefs (Green, 1968).

Teaching is often described as a decision-making and problem-solving process, similar to the work of physicians. This perspective has driven research into how teachers use information about students to adapt instruction and address individual learning needs (Calderhead, 1995).

According to NCTE (2003), the two ends of this continuum are:

Teaching is both human engineering and soul doctoring. Teaching encompasses the diverse tasks performed by teachers to guide learners toward the anticipated learning outcomes.

Upon analyzing these statements, it becomes evident that the first suggests teaching is both technical and noble. The phrase 'human engineering' subtly implies the potential to alter and shape human behavior in desired ways based on specific technical methods. Conversely, the term 'soul doctoring' elevates the concept, addressing the individual's inner spirit or soul to ensure its development. The second statement, however, emphasizes the teacher's role. The teacher engages in various activities within the classroom aimed at supporting learners to achieve their intended learning. In other words, the teacher possesses knowledge. That is, the teacher 'understands' or determines what students need to learn along with the necessary tasks to achieve that.

Based on the descriptions of teaching provided by various researchers, it can be concluded that, generally, teaching is an interactive process between teachers and students, occurring under specific conditions that facilitate effective knowledge construction by students.

Upon evaluating the definitions mentioned so far, it can be observed that none of them offers a comprehensive and functional definition of the term teaching. I would encourage you to formulate your own definition by drawing inspiration from the definitions outlined above.

Teaching can be categorized into three phases: pre-active, interactive, and post-active. Memory, Understanding, and Reflective represent three levels of teaching. Furthermore, there are four modes of teaching, namely conditioning, training, instruction, and indoctrination. Conditioning and training are regarded as lower levels of teaching, while instruction and indoctrination are seen as higher levels. We will explore these modes in detail in the following subsection.

2.3.2 Nature and Characteristics of Teaching

Based on the a forementioned definitions of teaching, let's examine some key characteristics:

1. Teaching is an interactive process aimed at achieving specific goals and intended outcomes.

2. Teaching encompasses both art and science.

3. Teaching is purposeful and directs learners towards intended knowledge. It is constructed and does not happen spontaneously.

4. Teaching can take various forms, including conditioning, formal training/informal training, instruction, and indoctrination.

5. Teaching is a tri-polar process involving educational objectives (learning experiences across three domains: cognitive, affective, and psychomotor, as well as behavioral change), teachers, and students.

6. Communication skills play a pivotal role in teaching.

7. Teaching is a professional activity that involves the teacher and student and results in the student's development.

8. The interactions conducted by the teacher during teaching are subject to scientific observation and analysis. Through these observations, the quality of communication employed by the teacher can be evaluated.

2.4 RELATION OF TEACHING WITH RELATED CONCEPT

As previously mentioned, teaching encompasses four modes: Conditioning, Training, Instruction, and Indoctrination. These modes are occasionally mistaken for being synonymous with teaching. In the following subsections, we will assess their interconnections. In reality, teaching is a broader concept, and each of these terms represents an aspect of this larger idea.Teaching exhibits four modes of behavior. This indicates that teaching is a continuum that ranges from behavior development to belief formation. Hence, teaching spans from conditioning to indoctrination, beginning with conditioning and culminating in indoctrination.

2.4.1 Teaching and Conditioning

Conditioning is a psychological process that modifies behavior through association or reinforcement, as described in theories such as Pavlov's classical conditioning and Skinner's operant conditioning. Classical conditioning involves associating a neutral stimulus with a significant stimulus to elicit a conditioned

response, while operant conditioning relies on rewards or punishments to shape behavior. Teaching and conditioning share the objective of influencing behavior but differ in scope and complexity. Conditioning is primarily limited to behavioral changes through stimulus-response mechanisms, while teaching encompasses higher-order cognitive processes, such as reasoning, creativity, and problem-solving. However, principles of conditioning are often integrated into teaching practices. For example, positive reinforcement, such as praise or rewards, can motivate students to participate actively, while negative reinforcement, such as reducing homework for consistent effort, can encourage desirable behaviors. Despite its utility in classroom management, conditioning has limitations in addressing the deeper cognitive and emotional aspects of learning that teaching encompasses.

2.4.2 Teaching and Instruction

Instruction is the systematic delivery of content to achieve specific learning objectives. It is structured, goal-oriented, and relies on methods such as lectures, demonstrations, and guided practice. While instruction focuses on the step-by-step organization of knowledge, teaching is a broader concept that includes emotional and ethical development. Instruction serves as a component of teaching, ensuring clarity and efficiency in content delivery. For instance, a teacher may use instructional methods to explain mathematical concepts while simultaneously encouraging problem-solving and critical thinking. Instructional design principles, such as Bloom's Taxonomy and Gagné's Nine Events of Instruction, further enhance teaching by providing a framework for organizing lessons and ensuring that learning objectives are met. However, teaching extends beyond instruction to include fostering creativity, ethical reasoning, and adaptability in learners.

2.4.3 Teaching and Training

Training focuses on developing specific skills through hands-on practice and repetition. It is task-oriented and aims at achieving immediate, measurable outcomes. Teaching, on the other hand, provides the theoretical foundation and broader understanding necessary for skill acquisition. While training is practical and application-focused, teaching nurtures intellectual growth, creativity, and ethical reasoning. For example, teaching computer programming might involve explaining underlying principles and algorithms, while training focuses on mastering coding skills through practice. Both teaching and training are complementary; teaching lays the groundwork for deeper understanding, while training ensures the application of learned concepts in real-world scenarios.

2.4.4 Teaching and Indoctrination

Indoctrination involves instilling rigid beliefs or doctrines without encouraging critical thinking or questioning. It relies on repetition and authority, often discouraging intellectual freedom and alternative viewpoints. Teaching, by contrast, promotes open inquiry, critical reasoning, and exploration of diverse perspectives. The ethical distinction between the two lies in teaching's commitment to fostering independent thinking and ethical reasoning. For instance, teaching history encourages students to analyze events from multiple viewpoints, while indoctrination presents a biased narrative that discourages debate. Teachers must remain

vigilant against unintentionally indoctrinating students and instead create an environment that values intellectual freedom and critical engagement.

2.4.5 Comparative Analysis

Teaching, conditioning, instruction, training, and indoctrination share overlapping elements but differ significantly in purpose and approach. Conditioning focuses on behavioral changes through reinforcement, while teaching includes broader cognitive and emotional dimensions. Instruction provides a structured framework for content delivery, whereas teaching integrates ethical reasoning and critical thinking. Training emphasizes skill acquisition through practical application, complementing the theoretical understanding provided by teaching.

Indoctrination, in contrast, undermines the core values of teaching by promoting uncritical acceptance of specific beliefs. Teaching remains distinct in its holistic approach to developing knowledge, values, and skills while fostering intellectual freedom and ethical reasoning.

2.5 CHECK YOUR PROGRESS

1. Which of the following focuses on imparting knowledge, concepts, and skills in a structured manner to promote understanding?

    A) Conditioning

    B) Teaching

    C) Indoctrination

    D) Training

2. The process that involves systematically influencing behavior through reinforcement and repetition is known as:

    A) Instruction

    B) Indoctrination

    C) Conditioning

    D) Training

3. Which term refers to the process of instilling specific beliefs or ideologies in learners, often without encouraging critical thinking or questioning?

    A) Training

    B) Teaching

    C) Indoctrination

    D) Instruction

2.6 LET US SUM UP

Teaching is a multidimensional process that encompasses elements of conditioning, instruction, training, and indoctrination while maintaining its distinct focus on holistic learner development. It integrates knowledge, values, and skills to prepare learners for the complexities of life. By incorporating educational technology and adhering to ethical principles, teaching can create meaningful learning experiences that empower students to think critically, act ethically, and contribute positively to society.

2.7 KEYWORDS/GLOSSARY

Teaching; Training; Conditioning; Instruction; Indoctrination.

2.8 SELF ASSESSMENT QUESTIONS

Q1. Define teaching.

Q2. Why teaching is considered both art as well as science?

Q3. List five characteristics of teaching.

Q4. What are the four modes of teaching?

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LESSON 3

INSTRUCTIONAL TECHNOLOGY: CONCEPT, SIGNIFICANCE AND DIFFERENCE BETWEEN EDUCATIONAL AND INSTRUCTIONAL TECHNOLOGY

Structure

3.1 INTRODUCTION

Human thought patterns underwent a dramatic and profound shift in the early 20th century. Radio and telecommunication hardware and software systems have been improved as a result of advancements in wireless systems and spacecraft technology. Today, technology and industrial advancement and there is creation of novel methods in various domains. Technology has an impact on every level of human existence. Almost every aspect of human life, including education, has seen the application of science and technology. The term 'educational technology' broadly encompasses the advancements made in the field of education. In today's classroom, educational technology has become an indispensable tool. It facilitates the better

pedagogical practices, enhances the goals of education, and helps teachers do their jobs better. Instructional technology, on the other hand is part of educational technology. Teacher uses it to maximize the learning outcomes of the learners. Let us understand this concept in detail.

3.2 LEARNING OBJECTIVES

After going through this chapter, learners will be able to:

✝ Understand the concept of Instructional technology (ET)

✝ Understand the significance of Instructional technology

✝ Explain the difference between Educational technology and Instructional technology

3.3 INSTRUCTIONAL TECHNOLOGY

3.3.1 Concept

The primary contributions to instructional technology were made by Gilbert (1962), Norman A. Crowder (1954), Robert Glaser, and B.F. Skinner (1955). A well-planned program intended to instill specific knowledge, skills, understandings, attitudes, and behavioral patterns in students is referred to as instruction. Technology involves the organized use of scientific knowledge to address practical issues. Specifically, instructional technology focuses on utilizing technology to enhance and support teaching practices. In instructional technology, five distinct fields of study are combined in theory and practice. Through design, development, use, management, and assessment, instructional technology creates productive and successful work environments.
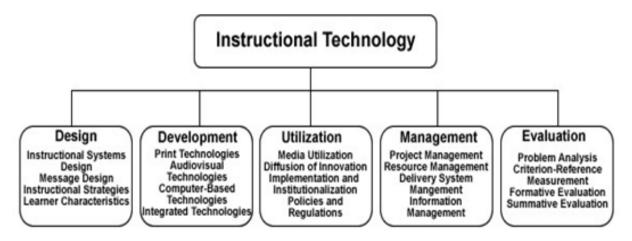
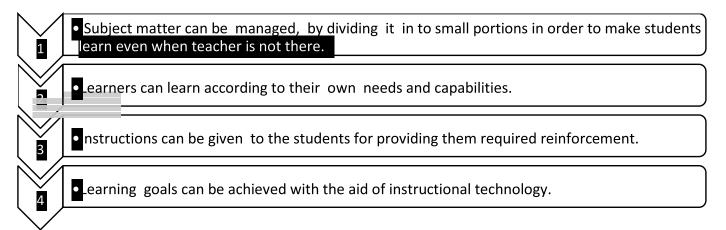*Figure – Instructional Technology and its Five Domains (Seels and Glasgow, 1998)*

Definitions of Instructional Technology

1. **Robert A. Cox** defines instructional technology as "application of scientific applications to man's learning."

2. **According to S.M.Mc Murin (1970),** "Instructional technology is a systematic way of designing, carrying out and evaluating the total process of teaching and learning, in terms of specific objectives based on research, human learning and communication.It employs the combination of human and non-human resources to bring out the more effective instruction."

3. **According to E.E. Haden**, "instructional technology is that branch of educational theory and practice, concerned primarily with design and the use of messages which control the learning process"

From the above, it's clear that instructional designers aim to shape dynamic and impactful learning journeys that captivate and inspire. As such, instructional technology involves a systematic approach to organizing teaching and learning activities, intended to apply knowledge consistently and efficiently to meet specific educational goals. The focus of instruction is on learning supporting activities, but no teacher-student interaction occurs during these activities. Although instruction is not teaching, it is present in all forms of teaching. In teaching, different actions are carried out, but in instruction, only information is provided. Teaching involves all three domains cognitive, psychomotor, and affective whereas instruction hardly touches on the cognitive domain. Instructional technology focuses on the scientific study of designs and development of instruction. Creating engaging, practical learning opportunities is the main objective of instructional designers. Therefore, instructional technology is a structured and organized sequence of teaching and learning activities designed to apply knowledge in a predictable way to achieve defined learning outcomes.

Basic Assumptions of Instructional Design

1. Subject matter can be managed, by dividing it in to small portions in order to make students learn even when teacher is not there.

2. Learners can learn according to their own needs and capabilities.

3. Instructions can be given to the students for providing them required reinforcement.

4. Learning goals can be achieved with the aid of instructional technology.

3.3.2 Importance of instructional Technology

The significance of Instructional Technology can be understood as:

1. Instructional Technology can make teachers more effective in terms of content creation, content delivery and evaluation.

2. Instructional Technology can help in achieving logical goals.

3. Individual differences can be controlled through instructional technology.

4. When the learning is backed by with instructional technology, students have the freedom to learn at their own pace, as the content tailored to their unique understanding and needs.

5. Conditioned response can be possible with the help of Instructional technology. Use of technology in instructions can provide required feedback and condition the response of the learners.

6. Instructional technology has its foundation in Psychological foundations of learning.

7. Instructional Technology helps in the exploration of detailed subject matter as it motivates learners through the presentation of content in unique and creative ways which results in optimism.

3.3.3 Implications of Instructional Technology

✥ **Improved Learning Experiences**: Technology offers personalized and multimediabased learning, enhancing student engagement. For example, Gamification makes learning more interactive and motivates students.

✥ **Information Accessibility**: Technology removes geographic limitations, giving students access to global resources and experts. Open Educational Resources (OER) provide affordable and easily accessible learning materials.

✥ **Collaboration and Communication**: Video calls and cloud tools enable immediate communication and teamwork, fostering collaboration regardless of location.

✥ **Informed Decision Making**: Technology helps teachers gather data on student performance, allowing for better-informed decisions and tailored support for students.

✥ **Equity and Challenges**: The digital divide leads to unequal access to technology, and some teachers may face challenges with technology integration. Overuse of technology may also hinder the development of traditional skills.

✥ **Evolving Roles**: Teachers role is shifting from central figures to facilitators, while students take a more active role in managing their learning with instructional technology.

✥ **Flexibility**: Technology makes education more accessible by offering flexible learning options that can be accessed anytime and from anywhere.

✥ **Continuous Learning**: Technology supports lifelong learning by offering online courses and micro learning, allowing individuals to acquire skills whenever needed.

3.4 DIFFERENCE BETWEEN EDUCATIONAL TECHNOLOGY AND INSTRUCTIONAL TECHNOLOGY

Educational technology	Instructional Technology
1. Its more wide-ranging and broad based concept including instructional technology.	1. Instructional technology is a branch of educational technology dedicated specifically to enhance the art of delivering instruction.
2. Educational technology is the scientific application of current human and non-human resources to address a range of educational issues, including instruction.	2. The goal of instructional technology is to increase the effectiveness of learning by giving learners the right stimuli to elicit particular kinds of reactions.
3. Objectives of instructional technology is determined in the context of the needs of the country.	3. Objectives of instructional technology are determined in the context of needs.
4. Instructional resources, including books, movies, and programming, are created on large scale.	4. Instructional materials are created based on the requirements of the classroom.
5. The selection of educational media is done to increase the effectiveness of teaching and learning in schools of many regions.	5. Selection of educational media is carried out for making teaching learning more effective in a given class or school.
6. Educational technology is focused on large-scale and long-term projects .	6. Instructional technology is focused with short term and small scale projects.
7. Feedback is stressed in order to improve teaching and learning at macro level.	7. Feedback is emphasized to improve teaching learning at micro level.
Example: An example of educational technology is **Google Classroom**, a widely used platform that helps teachers manage, distribute, and grade assignments in an organized manner.	**Example**: Programmed Instruction, interactive white board, Smart Classroom etc.

3.6 CHECK YOUR PROGRESS

1. Define instructional technology and give its significance.

2. What is instructional technology, and how does it differ from educational technology?

3. What are the primary goals of utilizing instructional technology in the classroom?

4. How can instructional technology be used to personalize learning experiences for students?

3.7 KEYWORDS/GLOSSARY

Educational Technology; Instructional Technology; Teaching Technology; Behavioural Technology.

3.8 LET US SUM UP

To sum up, we can say that, teaching focuses on helping people enhance their knowledge and comprehension. Educational technology is wide ranging concept, it involves the scientific application of current human and non-human resources to address a range of educational issues, including instruction. Instructional technology is primarily concerned with ways to accomplish predetermined learning goals. The Scientific, social and psychological principles are used by the instructor to accomplish these learning objectives.

3.9 SELF ASSESSMENT QUESTIONS

Dear learners, plan lesson according to your teaching subject and use Kahoot Application for designing instruction including content creation, content delivery, evaluation and feedback.

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LESSON : 4

COMMUNICATION AND INSTRUCTION

Structure

4.1. INTRODUCTION

The term communication originates from the Latin word *"communis,"* meaning "to make common." Communication enables the sharing of experiences, ideas, thoughts, feelings, or information with others. It encompasses various forms, such as thinking, dreaming, speaking, and arguing, reflecting its broad scope. Communication is a blend of skill, art, and science:

- It is a skill because it requires fundamental techniques.

- It is an art as it involves creativity and adaptability to challenges.

- It is a science due to the application of verifiable principles that enhance its effectiveness.

This combination makes communication a complex and multifaceted process.

4.2. LEARNING OBJECTIVES

After studying this unit, the Learners will be able to:

- ✜ To explain the concept of Communication. ❖ Use the various modes of Communication.

- ✜ Describe the various functions of Communication.

- ✜ Adopt the various models of Communication in their teaching learning.

- ✜ Identify and eliminate the various barriers in the Communication.

4.3. COMPONENTS OF COMMUNICATION

Communication is built upon eight primary components that are the foundation of communication theory. These elements are interconnected and indispensable for any communication process. Aristotle, among the first to articulate a communication paradigm, highlighted these three components. He designates them as: i) the speaker; ii) the speech; and iii) the audience.

The communication model proposed by Harold Lasswell and David Berlo is more frequently recognized.

Their paradigm posits that communication necessitates a minimum of four components: Source, Message, Channel, and Receiver (SMCR).

Here's a breakdown:

Source ⎯⎯⎯┐ **Encoder** ⎯⎯⎯┐ **Message** ⎯⎯⎯┐ **Decoder** ⎯⎯⎯┐ **Receiver**

a. Source

The **source** generates the message or sequence of messages to be shared. It initiates the communication process by deciding what needs to be conveyed.

b. Sender

The **sender**, often referred to as the transmitter, processes the message and converts it into a signal suitable for transmission through a chosen medium.

c. Channel

The **channel** serves as the medium or pathway through which the signal travels from the sender to the receiver. Examples include radio waves, cables, or the internet. **d. Receiver**

The **receiver** decodes the signal sent by the transmitter, reconstructing the original message for interpretation. It performs the reverse function of the sender.

e. Destination

The **destination** is the intended recipient of the message. It can be an individual, a group, or even a system designed to process information.

f. Message

Derived from the Latin word *mittere*, meaning "to send," the **message** is the core idea, information, or concept communicated. It can take various forms: oral, written, graphic, audio, visual, or a combination of these.

g. Feedback

Feedback completes the communication loop, turning a one-way exchange into a two-way interaction. It is the reaction or response from the destination back to the source, either directly or indirectly, ensuring clarity and effectiveness.

h. Context

The **context** provides the environment and background for the communication process. It defines the meaning

of the message by considering factors like space, time, culture, and situation. A single message can have different interpretations depending on the context.

Additional Elements

1. Entropy

Represents the uncertainty or unpredictability in the content of a message. While a certain level of entropy keeps communication dynamic, excessive uncertainty can lead to confusion.

2. Redundancy

Occurs when information is repeated, either intentionally or unintentionally. Deliberate redundancy reinforces the message, while unnecessary repetition may hinder communication.

3. Noise

Any interruption or disturbance that interferes with the transmission, reception, or comprehension of a message is referred to as noise.

Noise refers to anything that disrupts or interferes with effective communication. It can occur at any stage of the process and can be categorized as:

- **Physical Noise**: External disturbances like loud sounds, poor lighting, or environmental distractions.

- **Physiological Noise**: Biological factors like a pounding heart, fatigue, or illness that affect concentration.

- **Psychological Noise**: Mental distractions such as biases, assumptions, or preconceptions about the speaker or message.

- **Semantic Noise**: Confusion caused by complex or unclear word choices, like using "trisyllabic" instead of "three syllables."

Check your progress

1. What is the origin of the term "communication," and what does it mean?

2. Explain why communication is considered a blend of skill, art, and science.

3. List and briefly describe the various forms of communication mentioned in the introduction.

4.4. FUNCTIONS OF COMMUNICATION

Communication serves a variety of purposes, including informing, creating awareness, educating, persuading, motivating, and entertaining. Below are some of its key functions:

1. Sharing of Information

Information is essential for societal progress, and communication facilitates its dissemination across various areas of human activity, such as social, political, economic, educational, and developmental fields. Regular exposure to information over time helps generate awareness on critical issues. For example, knowledge about global warming, Pluto's reclassification, or advancements in governance technology would be absent without effective communication. Additionally, communication helps individuals understand their environment, shape opinions, make decisions, and choose actions that safeguard both personal and societal interests.

2. Education and Training

Communication enables the exchange of information, making individuals knowledgeable and productive members of society. From childhood, learning occurs through interactions with teachers and elders, helping individuals acquire new concepts and skills.

In modern education, communication plays a vital role in training teachers and learners. The success of learning depends not only on the content of the training but also on how effectively information and skills are conveyed. Interaction between learners and their peers, teachers, or information sources fosters knowledge construction, making communication essential for effective teaching and training.

3. Socialization

Communication is crucial for societal, national, and cultural well-being by exposing individuals to diverse perspectives. It promotes understanding and appreciation of pluralistic ideas and viewpoints, fostering unity and inclusivity within society. Through communication, people share and understand emotions, aspirations, and expectations, contributing to a cohesive social system.

4. Entertainment

To alleviate the monotony of daily life, communication provides access to various forms of entertainment, such as art, literature, music, films, dance, sports, and drama. While entertainment is a vital function, it has increasingly overshadowed other roles, particularly in mass communication media. Many television channels prioritize entertainment over informational content, offering superficial programming. It is essential to strike a balance, ensuring audiences benefit from both valuable information and quality entertainment.

5. Motivation

Motivated individuals contribute actively to society, and communication plays a key role in inspiring and persuading them to achieve shared goals. By sharing success stories of those who have overcome challenges, communication encourages others to persevere and achieve their aspirations.

6. Persuasion

Another significant function of communication is **persuasion**, which involves influencing individuals toward adopting new ideas, techniques, or products. This function is extensively utilized by industries, corporate organizations, and advertising agencies to promote their products and services to potential consumers on a wide scale. Various mass communication channels are employed for this purpose. However, it is important to exercise caution, as some advertisers may exploit this function for unethical purposes. In today's globalized and liberalized world, with increasing competition and consumerist culture, understanding the intentions behind persuasive communication is crucial.

7. Preservation of Culture

Communication also plays a vital role in preserving the culture and heritage of a nation or society. It ensures the transmission of values, traditions, and stories from epics such as the *Ramayana*, *Mahabharata*, *Bible*, and *Quran* to younger generations. Historically, this knowledge has been shared orally and through written texts. In modern times, various mass communication media have taken on the responsibility of safeguarding and disseminating cultural heritage, ensuring its continuity across generations.

4.5. Modes of Communication

Modes of communication denote the diverse channels or ways employed to convey information, thoughts, and emotions. These modes may be verbal, non-verbal, or technological, tailored to the needs and preferences of persons, cultures, and circumstances.

4.5.1. Verbal Communication

Verbal communication entails transmitting messages by speech and oral language. It can be professional or informal and occurs when we converse with other people. Non-verbal clues are frequently used in conjunction with spoken communication when it is done face-to-face.

This is the most straightforward method of communication, and it works very well when promptness and clarity are crucial.

Oral communication: It includes spoken exchanges like meetings, speeches, presentations, and discussions.

Written Communication: Text messages, emails, letters, reports, and other written correspondence.

Examples of Verbal communication:

    a) An instructor presenting a lesson to the class.

    b) A phone interview or in-person interview for a job.

    c) An organization that sends formal emails.

4.5.2. Nonverbal Communication

Sign language, appearance, eye contact, facial expressions, and body language. In addition to enhancing verbal communication, nonverbal communication can be useful in situations where words are insufficient. They place a high value on this kind of communication, making it crucial in interviews and conversations. It is essential for reinforcing the message that is communicated verbally and for expressing feelings.

❍ Body language include posture, facial expressions, and gestures.

❍ Paralinguistics: Voice volume, pitch, and tone.

❍ Eye Contact and Proximity: How message is communicated through physical proximity and eye contact.

Nonverbal Communication Examples:

• A greeting with a handshake.

• a smile that conveys friendship or approval.

• indicating agreement during a talk by nodding.

4.5.3. Written Communication the transmission of messages using written language. Emails, memoranda, texts, posts, and other forms of written communication are all examples. Written communication facilitates effective thought sharing, but occasionally it falls short of expressing the entire range of emotions you wish to express. It provides clarity and a permanent record, making it widely utilized in both personal and professional contexts.

Written communication examples include:

Emails are used in both personal and professional contexts for official and informal correspondence.

Reports are organized publications that provide information or updates.

Letters are official written communications that can be used for personal or professional purposes.

4.5.4. Listening

One of the most crucial aspects of communication is listening since it enables you to interact with the communicator in an efficient manner and comprehend their point of view. Correct listening and appropriate response are essential components of every communication process.

Effective listening strengthens interpersonal relationships and enhances comprehension.

Examples of Listening:

- **Active Listening**: Fully focusing on the speaker without distractions.

- **Empathetic Listening**: Understanding emotions and responding thoughtfully.

- **Critical Listening**: Evaluating the content to form logical conclusions.

4.5.5. Visual Communication

Using pictures, graphs, objects, and other visual components to communicate ideas is known as visual communication. It is widely used in presentations, television, and other media formats and is essential to contemporary techniques of disseminating important information.

By stimulating the visual senses, it improves comprehension and memory.

Visual Communication Examples:

- Infographics: Using visuals to help people understand data.

- Videos: distributing guides or commercials to keep viewers interested.

- Graphs: Showing statistical information to facilitate analysis.

4.5.6. Aural Communication

The sense of hearing is involved in aural communication. It includes a variety of spoken language, sound, and other auditory cue-based communication methods. Spoken words, nonverbal cues like voice tone, pitch, and rhythm, attentive listening, speech content and delivery, etc. are all part of aural communication.

For auditory learners and in circumstances when verbal communication is crucial, it is indispensable.

Aural Communication Examples:

- Podcasts: Using audio to share information or amusement.

- Music: Creatively expressing feelings or thoughts.

- Announcements: Verbally delivering information in public or at work.

4.5.7. External communication

The transfer of data and information both inside and outside of a business is referred to as external communication. Customers, suppliers, partners, investors, regulatory agencies, the media, and the general public are all involved in this external communication channel. It is essential for creating credibility and fostering relationships.

External Communication Examples:

- Press releases: Notifying the media of official announcements.

- Email correspondence with clients: Speaking with them about company updates.

- Posts on social media: interacting with clients and advertising offerings.

4.5.8. Interpretive Communication

Also known as **"one-way communication,"** this mode involves the receiver interpreting the information conveyed by the sender as it was originally intended. The receiver must comprehend the message in both written and spoken forms, taking into account various contextual factors.

For instance, in a classroom setting, students may not grasp every word spoken by the teacher but are expected to understand the key essence of the topic.

Key Features of Interpretive Communication:

- Learners focus on understanding, interpreting, and analyzing information presented through listening, reading, or viewing across various subjects.

- This communication mode requires interpreting the intent of the author or creator.

- There is no opportunity for active negotiation of meaning with the writer, speaker, or producer, making comprehension dependent solely on the receiver's interpretation.

4.5.9. Interpersonal Communication

Interpersonal communication refers to the exchange of information between individuals through verbal and nonverbal messages. This direct, unmediated form of communication occurs during interactions where individuals simultaneously influence one another, aiming to build and maintain relationships.

While interpersonal communication includes oral, written, and non-verbal forms, it is most commonly associated with spoken communication that occurs between two or more individuals in a personal or face-to-face context.

Examples of Interpersonal Communication:

- Personal Interviews

- Telephone Conversations

- Interactive Discussions

- Debates

- Emails

- Text Messaging

4.5.10. Group Communication

Group communication refers to the exchange of information among people in group settings. It is an extension of interpersonal communication, involving more than two individuals. Groups can be formal or informal, depending on the type and objectives of the communication, but they usually share common interests and goals. The dynamics within groups can vary and are often complex.

For instance, the structure, purpose, and interactions of a group that gathers for morning exercise in a park will differ significantly from a group participating in a national seminar on social, educational, or political issues, or a group discussing shareholder concerns. In some cases, groups can evolve into mobs, such as when a peaceful student demonstration turns unruly due to a breakdown in communication with school management.

The process of communication within a group is influenced by factors such as its size, nature, objectives, and dynamics:

- In small groups with members physically present, communication resembles interpersonal interaction, where participants can observe facial expressions, body language, and other non-verbal cues. Questions can be asked, doubts clarified, and feedback provided effectively.

- As the size of the group increases, these nuances become harder to discern, reducing the scope for personal interaction and immediate feedback.

Group communication is particularly valuable for collective decision-making on problems, issues, or matters of common interest. With quality group members and effective leadership, decisions can be enriched by incorporating diverse perspectives. However, challenges exist:

- Not all members may actively participate, as some may dominate discussions while others may feel too shy or hesitant to share their views, leading to an uneven flow of communication.

These dynamics hold significant implications for group communication, particularly in classroom settings, where the quality of interactions and participation can greatly influence the effectiveness of communication.

4.5.l1. Mass Communication

Mass communication differs significantly from other forms of communication, such as interpersonal, interpretive, and group communication. In this mode, the communicator and the audience are separated by time and place, and communication occurs simultaneously with the help of electronic devices, often involving an

institutional framework. These devices, known as **mass media**, include print, radio, television, the internet, and more.

The audience in mass communication is heterogeneous, consisting of individuals with diverse profiles who are often unknown to one another and dispersed across various locations. Feedback in mass communication is typically weaker and more delayed compared to interpersonal and group communication. However, with advancements in **Information and**

Communication Technology (ICT), electronic media has become increasingly interactive, allowing for more immediate feedback. Despite this, traditional mass communication mediums, such as newspapers, journals, and news broadcasts, still generate limited feedback compared to newer, interactive communication platforms.

ICT developments have also transformed interpersonal and group communication by eliminating the necessity for physical presence. Activities like phone calls, email exchanges, and video conferencing now enable people to connect and interact efficiently, regardless of their location.

Check your Progress

1. What are the primary purposes of communication? List at least five.

2. How does communication help in sharing information across different fields? Provide examples.

4.6. MODELS OF COMMUNICATION

Communication models explain how information flows from a sender to a receiver, considering elements like feedback, channel, and context. These models have evolved significantly over time, influenced by various disciplines:

Aristotle's Model (300 B.C.):

- Focused on public speaking with three key elements: speaker, speech, and audience.

- Highlighted the need to adapt messages to different audiences and occasions.

Lasswell's Model (1948):

- Introduced the formula: *Who says What to Whom through What Channel with What Effect*.

Shannon and Weaver's Model (1949):

- Proposed the first modern communication model, emphasizing information flow, noise, and feedback.

Newcomb's ABX Model (1953):

- Examined communication's role in maintaining social equilibrium.

Schramm's Model (1954):

- Stressed the importance of shared experiences and language for effective communication.

Berlo's SMCR Model (1960):

- Focused on the sender, message, channel, and receiver as essential elements of communication.

Transactional Model (Barnlund, 1970):

- Emphasized that communication is a simultaneous process of sending and receiving messages.

Ecological Model (Foulger, 2002):

- Highlighted the interaction between communication, media, and technology.

Some of the well Known models of Communication are discussed below:

4.6.1. Aristotle's Model

The first person to provide the first fundamental paradigm of persuasive communication was Aristotle (384–322 B.C.). Three communication components are included in his explanation: the speaker, the subject, and the audience.

According to Aristotle, these three components are necessary for meaningful communication, and we can group our research on the communication process under these three headings: i) the speaker, ii) the speech they make, and iii) the listener.

The study of communication involves five phases, according to ancient wisdom: creativity, organization, language, memory, and delivery. According to Aristotle, creating a message entails Invention (finding the content), arrangement (arranging the material in a logical sequence), language or style (to reach the audience), Memory and delivery (the act of actually presenting the information).

4.6.2. Harold Lasswell's Model of Communication (1948)

Harold Lasswell, a prominent American political scientist and communication theorist, introduced one of the earliest communication models in his work *Structure and Function of Communication in Society*. Building on Aristotle's rhetorical framework, Lasswell expanded the model by incorporating the concept of channels or mediums, viewing communication as an "object." While Aristotle focused on orators, Lasswell analyzed messages in mass media.

Lasswell proposed that an act of communication could be effectively described by answering five key questions:

- **Who**
- **Says What**
- **In Which Channel**
- **To Whom**
- **With What Effect**

These questions form the foundation of what is commonly known as Lasswell's **5Ws Model**.

Functions of Communication (According to Lasswell)

Lasswell identified three primary functions of communication:

1. **Surveillance of the Environment**: Observing and reporting on events and changes in the world.

2. **Correlation of Society's Components**: Connecting various elements of society to ensure stability and coherence.

3. **Cultural Transmission**: Sharing cultural values and traditions across generations.

Strengths and Limitations

- **Strengths**:

Lasswell's model is simple, versatile, and applicable to various forms of communication, including mass communication and interpersonal contexts.

- **Limitations**:

It lacks mention of **feedback** and **noise**, both of which are essential for a complete understanding of communication processes.

4.6.3. Shannon and Weaver Model (1949)

Claude Shannon and Warren Weaver's model is regarded as one of the most significant models of communication and served as the foundation for numerous subsequent models. Because it uses signal transmission for communication, it is known as the transmission model of communication.

Received   Signal
Information Source → Transmitter → Channel → Receiver
Message   Signal
Message
Noise Source
Destination

In this model, the **information source** generates a message to be communicated from a set of possible messages. The message may be in spoken or written form. The **transmitter** then converts this message into a signal suitable for transmission through the chosen **channel**, which serves as the medium carrying the signal to the receiver. The **receiver** reverses the transmitter's operation, reconstructing the original message from the signal. The **destination** is the intended recipient of the message, whether a person or a system.

This model introduced key concepts such as:

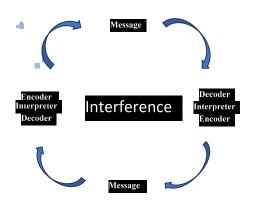- **Noise**: Disturbances or errors during transmission or reception that affect the clarity of the message.

- **Entropy**: The level of uncertainty in the information being communicated.

- **Redundancy**: The repetition of information to reduce uncertainty and mitigate the effects of noise.

The model emphasizes that for effective communication, higher levels of noise require increased redundancy to ensure the message is clear and comprehensible.

4.6.4. Wilbur Schramm & Osgood's Model of Communication (1954)

To address the limitations of earlier linear communication models, Wilbur Schramm and Charles Osgood introduced a **Circular Model** in 1954. This model illustrates how communication functions between individuals or within oneself, encompassing both **intrapersonal** and **interpersonal** communication. Unlike linear models, Schramm emphasized that communication is an **endless process**, with no clear beginning or end. In this model, the participants alternate between the roles of sender and receiver, engaging in a continuous cycle of **encoding, decoding, and interpreting** messages. The model also considers the impact of **semantic noise** (e.g., cultural differences, socioeconomics, education, and values) and its influence on message perception and understanding. The Osgood-Schramm model highlights not only the transmission of a message but also the complexities of how it is received, perceived, and interpreted, acknowledging that individual interpretations can vary due to differences in personal context and background.

4.7. BARRIERS IN COMMUNICATION

4.7.1. Semantic Barriers

The term "semantics" is derived from the Greek word "semantikos" which meaning "significant." Semantic barriers arise when the sender and the recipient interpret the message differently. For instance, when someone uses the word "bimonthly," they may interpret it as meaning twice a month, but the person hearing it may interpret it as meaning every other month.

The following factors contribute to semantic barriers:

❍ Interpreting symbols in various ways.

❍ Ineffectively conveyed messages because of unclear communication, thoughtless omissions, incoherence, poor terminology, jargon, etc.

❍ Incorrect Interpretation.

❍ Physical Noise: The channel is hindered by environmental noise, which leads to semantic issues.

❍ Poor translations result in decreased efficiency and high expenses.

Imprecise assumptions that may be unclear to both the sender and the recipient.

4.7.2. Psychological Barriers

Emotional barriers are another name for psychological obstacles. Effective communication reflects the mental states of both the sender and the recipient. Some of the psychological obstacles are as follows:

❍ Premature evaluation: this refers to interpreting a message differently before it is fully developed.

❍ The second is inattention.

❍ Communication loss as a result of transmission and low retention power.

❍ A barrier is created by mistrust between the communicator and the communicated.

4.7.3. Organizational Barriers:

Barriers inside the organization: The organizational obstacles are as follows:

❍ The effectiveness of communication may be impacted if an organization's organizational policy is not supportive.

❍ Tight regulations could make communication difficult.

❍ A superior's status or level may cause a psychological gap with his subordinates.

❍ Communication delays may result from the organization's higher level of hierarchy.

❍ Communication can be hampered by inadequate facilities for efficient communication.

4.7.4. Physical Barriers to Communication

Physical barriers are obstacles in the environment that interfere with effective communication. They may arise from natural surroundings or human-made conditions and can prevent a message from being delivered, received, or interpreted correctly. Some of the barriers are :

1. Noise

    o Disruptive sounds or technical issues hinder message clarity.

    o **Fix**: Use quiet spaces, repair equipment, and proofread written messages.

2. Message Distortion

    o Misinterpretation due to missing details or channel issues.

    o **Fix**: Proofread, use reliable channels, and confirm understanding.

3. Architecture

    o Workplace layout limits interaction (e.g., closed doors, distant offices).

    o **Fix**: Design open spaces and encourage accessibility.

4. Technical Difficulties

    o Malfunctions in communication tools disrupt conversations.

    o **Fix**: Maintain tools, troubleshoot, and have backup methods.

5. Time

    o Time zone differences and delays impact message timing.

    o **Fix**: Use clear schedules, consistent meeting times, and share recordings.

6. Distance

    o Physical separation limits non-verbal cues and personal interactions.

    o **Fix**: Use video calls and confirm details in writing.

7. Surplus of Information

    o Overloading messages causes confusion and missed details.

    o **Fix**: Focus on key points, keep messages concise, and clarify before moving on

4.8 CHECK YOUR PROGRESS

    a. What are the key elements of Aristotle's Model of Communication?

    b. How does Lasswell's 5 Ws Model contribute to understanding mass communication?

4.9 LET US SUM UP

The unit offers a thorough examination of communication, including its definition, elements, purposes, modes, models, and obstacles. In order to facilitate the flow of ideas, information, and emotions, it says that communication is a combination of art, science, and talent. The functions span from educating and informing to amusing, persuading, and socializing. The essential elements are the sender, message, channel, receiver, feedback, and context. Numerous communication modalities—verbal, nonverbal, written, and visual—as well as their importance are covered. A number of communication models, such as those developed by Aristotle, Lasswell, Shannon-Weaver, and Schramm, show how messages are sent and received. In addition, the text identifies the organizational, psychological, physical, and semantic barriers to communication that impede productive relationships and offers strategies for overcoming them for more effective and transparent communication.

4.10 KEYWORDS/GLOSSARY

Communication; Mass Communication; Communication. Models of Communication; Barriers in

4.11 SELF ASSESSMENT QUESTIONS

Q1. Which of the following is an example of non-verbal communication?

    A) Writing an email

    B) Making a phone call

    C) Using facial expressions

    D) Participating in a group discussion

Q2. The process of converting ideas into messages is known as:

    A) Decoding

    B) Encoding

    C) Feedback

    D) Transmission

Q3. Active listening involves:

A) Interrupting the speaker to ask questions

B) Focusing only on the words being spoken

C) Paying attention, providing feedback, and showing understanding

D) Formulating a response while the speaker is talking

4.12 SUGGESTED READINGS

1. Communication Skills by Sanjay Kumar and Pushap Lata, Oxford Higher Education.

LESSON : 5

INSTRUCTIONAL DESIGN

Structure

5.1 INTRODUCTION

Instruction refers to a structured plan for teaching and learning activities that organizes the learning process to motivate students. Its primary purpose is to facilitate learning. Gustafson (1996) defines instructional design as a systematic process involving:

1. Analysing what needs to be taught or learned,

2. Deciding how it will be taught or learned,

3. Conducting trials and making revisions, and

4. Evaluating whether learners achieve the intended outcomes.

5.2 LEARNING OBJECTIVES

After the completion of the lesson, you will be able to -

✟ Understand the Concept of Instructional Design

✟ Implement Instructional Models and Theories

✟ Create Effective Instructional Strategies

✟ Design and Apply Effective Learning Materials

✟ Assess and Enhance Instructional Design

Instruction operates as a coordinated process where all components—teachers, students, materials, and the learning environment—play essential roles in fostering successful learning (Dick & Carey, 1996). Teaching and learning activities should help students acquire knowledge and transfer it from short-term to long-term memory. To achieve this, students must learn to rehearse, encode, process, and provide feedback on new knowledge, enabling them to recall it when needed.

Instructional design is a process aimed at solving educational challenges by systematically analysing learning conditions and creating effective learning experiences. Essentially, it involves translating learning and instructional principles into detailed plans for instructional materials or activities. These plans are grounded in successful learning theories from the past. Instructional designers create materials that are not only functional but also engaging and appealing to users. They utilize established learning theories and principles as problem-solving models to guide their design decisions (Smith & Ragan, 1999).

Designing and developing instructional materials is a comprehensive and intricate process focused on addressing specific instructional and learning problems. Instructional designers concentrate on three core concerns:

✟ **Goals**: Determining the objectives of the instruction (Where are we going?).

✟ **Instructional Strategy**: Deciding on the instructional strategy and medium (How will we get there?).

✟ **Evaluation**: Assessing and revising instructional materials for future improvements (How will we know when we have arrived?) (Smith & Ragan, 1999).

Numerous factors influence the instructional design process, all of which are interconnected and impact one another. These factors must be systematically organized within the steps of instructional design. For instance, if goals and objectives are not clearly defined or wellwritten, subsequent steps may face issues due to incomplete or inappropriate groundwork. Hence, the steps in instructional design should follow a logical and coherent order, as each detail can significantly impact implementation. Every decision should be purposeful and based on sound reasoning.

Designers must understand the relationships among the steps and gather reliable data on students, their backgrounds, and prior knowledge, as these elements affect instructional outcomes. This data helps designers create balanced models that address these factors effectively. Instructional design models provide structured methods for creating instruction and aid educators in identifying and solving teaching-learning challenges. A successful model ensures effective instruction by addressing such challenges.

Effective instruction helps students develop the required skills, knowledge, and attitudes (Reiser & Dick, 1996). Motivating students during the instructional process requires careful consideration of all relevant factors. Four principles are key to this process:

1. Clearly define general goals and specific objectives that students are expected to achieve.

2. Plan instructional activities that support students in meeting these objectives.

3. Develop assessment tools to evaluate the attainment of objectives.

4. Revise instruction based on students' performance and feedback on instructional activities (Reiser & Dick, 1996).

Teachers should adhere to these principles to successfully implement instruction. The overarching aim of instructional design is to effectively plan, develop, evaluate, and manage the teaching and learning process. By the end of this process, student performance in instructional activities, aligned with defined goals and objectives, provides evidence of learning outcomes.

Therefore, in addition to demonstrating, tolling, and explaining, instruction also involves the physical setup, the way the material is presented, the order in which the tasks are required, and the reactions to the learner's actions (Resnick,2014). Therefore, **the process of creating, developing, and delivering learning experiences is known as instructional design**. The way it builds those experiences is so that students gain knowledge

or skills. Instructional designers adhere to a variety of educational theories and models concerning human learning and the cognitive processes that underlie the educational process. The effectiveness of instruction in transferring knowledge or teaching skills to students is guaranteed by these models.

For the purpose of creating educational materials that promote the most fulfilling and optimal outcomes, Instructional Design offers an organised framework. Its main objective is to improve the educational process by matching content to particular objectives and adjusting it to the preferences and traits of the intended audience. Instructional design emerged as an academic field and profession by integrating knowledge from disciplines such as behavioural sciences, military training, and education.

The foundation of modern instructional design theories can be traced back to World War II. During this period, soldiers required specialized training for complex tasks. Drawing on B.F. Skinner's research in behavioural science, military trainers developed a method of breaking tasks into smaller, focused learning objectives. This approach significantly improved training outcomes.

After the war, many successful military training methods were adapted for use in business and education. Over the remainder of the 20th century, numerous learning theories, models, and processes were developed and refined. These foundational concepts continue to influence modern education and workplace training practices.

5.2.1 Functions of Instructional Design

The function of instructional system design and its significance

The role of ID plays a crucial role in determining the overall approach to instruction. It is significant because:

Alignment with Learning Objectives: ID ensures that educational resources are specifically created to meet predetermined mastery goals. This alignment will make it more likely that desired outcomes will be achieved.

Learner-centred Approach: ID centres the process of designing instruction around the learner. Instructional materials become more relevant and engaging when learner needs, abilities, and prior knowledge are taken into account.

Efficiency and Resource Optimisation: By eliminating irrelevant content and focussing on the most important information for learning, ID maximises the use of sources. This performance guarantees that educational resources are effective and make the most of novices' time.

Flexibility and Adaptability: Because ID is methodical, it can be adjusted to various learner profiles, technological settings, and learning environments. Because of this adaptability, educational resources are guaranteed to stay effective and current over time.

5.2.2. Core Phases of Instructional Design

Instructional design projects each come with their unique challenges, requiring creative problem-solving and informed decision-making. It is a dynamic process informed by psychology, education, communication, and technology, not just a step-by-step model. While models guide designers, they must be adapted to real-world contexts.

Analysis: This phase involves gathering and interpreting information to define the instructional problem accurately. Key tasks include identifying job performance requirements and training needs, assessing the learning environment and learner characteristics, and consulting stakeholders like industry experts and educators.

Design: This phase turns the analysis into a structured plan or blueprint. It focuses on defining the purpose and objectives of the instructional program, assessment strategies, content selection, instructional methods, delivery systems, and strategies for evaluating effectiveness.

Development and Implementation: This involves creating, reviewing, and producing learning materials. It ensures alignment with the design specifications, adapts plans to emerging needs, collaborates with multidisciplinary teams, and conducts formative evaluation through pilot testing and user feedback.

Evaluation: This phase ensures instructional effectiveness through:

- **Formative evaluation:** Ongoing feedback during development to refine materials.

- **Summative evaluation:** Final assessment of the instructional impact, often conducted by independent evaluators.

Key questions addressed include whether learning materials achieve their intended impact, if job performance and learning outcomes improve, if content is relevant and delivered appropriately, and what refinements are needed.

5.3. INSTRUCTIONAL MODELS (ID)

Models are valuable tools for instructional designers, enabling them to visualize learners' training needs and outline the stages of creating support materials, serving as comprehensive guides for educators. According to Kent L. Gustafson and Robert Maribe Branch in their "Survey of Instructional Development Models," these models help conceptualize complex realities by providing simplified representations of more intricate forms, processes, and functions. This simplification is crucial because reality is often too complicated to represent fully. Models pinpoint generic and applicable elements across various contexts.

Dee Andrews and Ludwika A. Goodson emphasize the purposes of systematic instructional design models,

noting that they enhance learning and instruction through problem-solving and feedback mechanisms. They also improve the management of instructional design and development by offering monitoring and control functions. Additionally, these models refine evaluation processes through designated components and events and facilitate the testing or development of instructional theory through theory-based design.

5.3.1 ADDIE Model

ADDIE stands for Analysis, Design, Development, Implementation, and Evaluation. Many instructional design models developed later are based on this foundational model.

Fig: ADDIE Model

Analysis Phase: This stage involves examining learners' needs, interests, age, and prior learning. It is during this phase that instructional goals and objectives are established. **Design Phase:** At this point, instructional interventions are carefully planned. This includes deciding on the content to be taught, the sequence in which it will be delivered, and the media to be used. Content is selected and analysed to align with the instructional goals and objectives.

Development Phase: Learning materials are created or existing ones are utilized. For example, text-based materials are developed. These materials are then tested on a small group and refined based on feedback.

Implementation Phase: The course or program is put into practice during this phase.

Evaluation Phase: The final phase involves assessing the effectiveness of the instruction based on predefined objectives. This approach ensures that teaching and learning remain focused and are continuously monitored and improved. However, it has some limitations, such as its inability to accommodate diverse learning outcomes due to fixed goals.

5.3.2. The Gagné Model

It is Developed by educational psychology specialist Robert Mills Gagné (1916-2002), the Gagné Model involves several stages. Gagné outlines five examples of learning outcomes within instructional programs: intellectual skills, cognitive strategies, verbal information, motor skills, and attitudes. He emphasizes that learning conditions can be either external or internal to the student. Gagné also details nine training events designed to guide the student from their initial state to acquiring the ability identified as the lesson's objective. However, he notes that the sequence of these events may vary depending on the objective.The nine training events are;

Fig. Gagne Model

1. **Gaining Attention**: Capture students' interest by appealing to their unique interests, asking intriguing questions, conducting demonstrations, or showing relevant film or TV fragments (R. M. Gagné, L. J. Briggs, 1977, pp. 138-139).

2. **Informing the Student of the Objective**: Clearly state the activity's objective to help students focus and guide the teacher's evaluation. Tailor the presentation of the objective to the students' age.

3. **Stimulating Recall of Prior Learning**: Facilitate the acquisition of new content by connecting it to previously learned material.

4. **Presentation of Stimulus Material**: Present materials that reflect the learning objectives. For instance, in History, facts or events should be communicated orally or in writing (R. M. Gagné, L. J. Briggs, 1977, p. 141).

5. **Directing Learning Activities**: The teacher devises strategies to ensure the learning objectives are met and documents these plans in detail.

6. **Performance Achievement**: Verify the extent to which students have understood and assimilated the new content.

7. **Providing Feedback**: Inform students about the accuracy of their performance through various feedback forms, such as gestures, smiles, or words (R. M. Gagné, L. J. Briggs, 1977, p. 141).

8. **Performance Evaluation**: Ensure that the performance is genuine and aligns with the set objectives.

9. **Reinforcement of Retention and Transfer**: Strengthen retention and application of the learned material by discussing the covered topic and linking it to future topics.

By following these steps, instructional designers can create effective and engaging learning experiences for students.

5.3.3 The ASSURE Model

The ASSURE model, developed in the 1990s by Robert Heinich and later refined by Michel Molenda, James Russell, and Sharon Smaldino, is designed specifically for teachers to integrate technology and media resources into their lessons. It is based on Robert Gagné's nine instructional events and provides support for lesson realization. The model is learner-centred, adaptable for all levels of teaching experience, and creates a learning environment suited to learners' needs. The paper "Instructional Media and Technologies for Learning" by the four authors discusses the role of instructional media in learning and presents a variety of media formats for instructional activities using the ASSURE model.

Fig. ASSURE model

The ASSURE model comprises six stages:

1. **Learner Analysis:** This stage involves analyzing general characteristics such as age, education level, work experience, cultural or socio-economic factors, skills learners possess, and their learning styles (visual, auditory, tactile, logical, etc.).

2. **Establishing Objectives:** This crucial stage determines what learners will achieve by the end of the activity. The authors propose the ABCD model (Audience, Behavior, Condition, and Degree):

✠ **Audience:** Identifies who will achieve the goal.

✠ **Behavior:** Describes the learners' behavior and performance at the end of the instruction using measurable action verbs.

✠ **Condition:** Specifies the conditions under which the behavior will be performed.

✠ **Degree:** The performance criteria, including time available, accuracy level, percentage of correct answers, and qualitative standards.

3. **Selection of Methods, Materials, and Media Resources:** Once target group analysis and lesson objectives are established, the instructional designer focuses on the instructional activity, involving three sequences:

✠ Deciding on appropriate methods to teach content.

✠ Choosing a media format to fit the methods.

✠ Selecting, modifying, or creating supporting materials suitable for the chosen media format.

Criteria for selecting materials include curriculum compliance, accuracy, clarity, motivation, student participation, technical quality, effectiveness, and the availability of a user guide.

4. **Use of Materials:** This stage includes previewing materials, lesson preparation, detailed descriptions of activities, and how to integrate methods and selected materials. It also involves checking necessary equipment, arranging the space, and preparing learners by providing an overview, making connections with prior lessons, and presenting benefits of paying attention.

5. **Requesting Student Participation:** Activities that engage students actively throughout the educational process, including topics for dialogue, discussion, or debate, and clear problem statements.

6. **Evaluation/Review:** Evaluating learners' performance, the adopted strategy, and the instructor's teaching style to improve future efforts. Evaluation is continuous—before, during, and after instruction completion. Based on evaluation results, materials are revised, marking evaluation as a new beginning.

Answers to check your Progress

Q1. Define instructional design and explain its primary purpose.

Q2. What are the four main phases of instructional design?

Q3. What is the purpose of instructional design models? Explain its types.

5.4. FORMULATION OF INSTRUCTIONAL STRATEGIES

To design effective instructions, goals and objectives must first be determined, which guide the creation of courseware aimed at achieving these goals. Learning occurs in three domains: **cognitive** (thinking, like figuring out a key to unlock something), **affective** (feelings, such as respecting the environment), and **psychomotor** (coordination of thought and physical movement, like carpentry or administering an injection). While designing instructions, it's crucial to consider which domain(s) of learning the courseware will target.

Gagné identified five key capabilities that learning should develop:

1. **Intellectual Skills** (problem-solving, understanding concepts),

2. **Cognitive Strategy** (monitoring one's learning),

3. **Verbal Information** (ability to describe something),

4. **Attitude** (respect for wildlife),

5. **Motor Skills** (skills like dancing, skating).

According to Gagné, instructional design should aim to develop multiple capabilities rather han focusing on just one or a few.According to the Commonwealth of Learning (2005), the steps for detailed instructional planning are:

1. Need Analysis: Conduct a survey to determine learners' characteristics and learning needs.

2. Setting Instructional Goals: Clearly state the learning outcomes.

3. Assessment Strategy: Decide how learning will be evaluated at the end of the course and during the course.

4. Task Analysis:

✟ Determine activities learners need to perform to achieve the desired outcomes.

✟ Identify necessary graphics.

✟ Plan self-assessment exercises.

5. Develop Content: Create the units and course content.

6. Test and Evaluate: Assess the materials and make improvements based on feedback.

7. Revise the Plan: Use evaluation results to revise and improve the instructional plan. These steps are iterative, meaning they are repeated in a cyclical manner as learning outcomes lead to re-evaluation and re-planning of goals and input.

5.4.1. Task Analysis: Definition and Purpose

Task Analysis in instructional design is the systematic process of identifying and articulating the learning required for learners to perform specific tasks effectively. It ensures instruction aligns with desired learning outcomes by breaking down tasks into their essential components and cognitive processes.

Purpose of Task Analysis

Task analysis helps instructional designers:

- ✟ Define learning goals 'and objectives.
- ✟ Understand job roles, skills, and cognitive processes involved in task performance.
- ✟ Identify knowledge types (declarative, procedural, structural) relevant to a task.
- ✟ Prioritize tasks for training resource allocation.
- ✟ Determine the sequence of task performance for teaching and learning.
- ✟ Design effective instructional strategies, activities, and media.
- ✟ Develop performance assessments and evaluations.

Key Assumptions of Task Analysis

1. **Foundation of Instructional Design**: Task analysis provides the intellectual groundwork for designing effective learning, guiding the process by defining goals and objectives.

2. **Essential Across Paradigms**: Whether in behaviourist, cognitive, or constructivist frameworks, task analysis remains vital for understanding and supporting learning, though methods differ depending on the paradigm.

3. **Underutilized Component**: While a core part of the ADDIE model, task analysis is often underperformed or misunderstood due to insufficient training or reliance on procedural methods.

4. **Ambiguity and Complexity**:

   o Task analysis faces challenges due to diverse methods and applications across various settings and professions.

   o It seeks to reduce instructional ambiguity by systematically defining performance parameters, even though not all human behaviors or thought processes can be precisely articulated.

5. **Context-Specific Methods**:

   o Different contexts and instructional goals require tailored task analysis approaches (e.g., job, learning, cognitive, activity, or subject matter analysis).

o Designers must select appropriate methods to produce the desired outcomes.

6. **Skill and Judgment**: Successful task analysis depends on the designer's ability to make informed decisions and adapt methods to instructional needs rather than relying on rigid, procedural approaches.

Task analysis enhances instructional design by ensuring a comprehensive understanding of learning outcomes. It equips designers to select methods and tools that align with the specific instructional context, fostering better instruction and improved learner performance.

5.4.2 Instructional Strategies

Instructional strategies are techniques used by teachers to help students become independent and strategic learners. When students independently choose and effectively use these strategies to accomplish tasks or meet goals, they become learning strategies. These strategies can be applied across different grade levels and subjects, accommodating various student differences. They help students learn basic skills such as reading, writing, speaking, listening, and computation, and also understand and remember facts and concepts.

5.4.2.1 Lecture

Introduction: The first few words of a lecture should capture the audience's attention, arouse their curiosity, and ensure their undivided focus. This initial impression is crucial for active listening and usually lasts 3 to 5 minutes. During this stage, the teacher should provide a general overview and framework for the lecture's content.

Definition: The lecture method involves presenting information orally to a class with minimal student participation.

Purposes of the Lecture Method:

- ✟ To motivate, sensitize, and stimulate students in their learning objectives.
- ✟ To introduce a new topic or subject, fostering close personal contact with students.
- ✟ To provide structured knowledge about a specific concept.
- ✟ To motivate and guide students in acquiring knowledge.
- ✟ To spark interest in a particular subject.
- ✟ To promote critical thinking.
- ✟ To facilitate good human relationships.
- ✟ To develop problem-solving skills based on facts.
- ✟ To achieve high-order cognitive objectives.

✞ To stimulate students' thinking.

✞ To develop concentration in students.

Body of the Lecture: The main content of the lecture is presented in an organized manner, focusing on content delivery. The teacher is active while students are relatively passive. Question-and-answer techniques are used to keep students attentive. The teacher plans and controls all student activities, using various examples and situations to help students understand the concept.

Importance of the Lecture Method:

✞ A well-presented lecture motivates students.

✞ It is effective for introducing new topics.

✞ It creates enthusiasm and interest among students.

✞ It provides students with a sense of security through proper guidance.

✞ Factual information is presented directly and logically.

✞ It saves time and energy by teaching a large number of students simultaneously.

✞ It allows the teacher to have complete control of the classroom.

✞ It fosters personal contact between the teacher and students.

✞ It helps monitor the progress of each student.

✞ It is easier to create than other instructional methods.

✞ It is familiar to most teachers, as it is typically the method they were taught with.

5.4.2.2 Seminar: Concept and importance

Concept: The term "seminar" originates from the Latin word *seminarium*, meaning 'seed plot.' A seminar is an instructional technique where a group engages in guided interaction on a theme. Commonly used in teaching higher-level students such as postgraduates and research scholars, seminars generate situations for participants to interact and discuss various aspects of a topic, typically presented by one or more members.

Types of Seminars:

✞ **Mini Seminar:** Small-scale discussions within a classroom, offering training in questioning, organizing, and presentation skills.

✞ **Main Seminar:** Institutional or departmental seminars on specific topics, held monthly, involving students and teachers.

- **National Seminar:** Conducted by organizations with academic or professional interests at the national level, involving subject experts.

- **International Seminar:** Organized by international bodies, these seminars cover broader themes like globalization and policy implementation.

Roles in a Seminar:

- **President/Convener:** Plans and prepares the seminar, sets the theme, and oversees administrative functions.

- **Organizing Secretary:** Manages planning, execution, and administrative tasks, circulates information, and oversees the seminar's progression.

- **Chairperson of Technical Session:** Controls the session, clarifies presentations, and summarizes discussions.

- **Speaker/Paper Presenter:** Prepares and presents articles on the seminar's theme, engages in discussions, and responds to questions.

- **Participants:** Actively engage in discussions, ask questions, and contribute relevant experiences and knowledge.

- **Observers:** Eminent guests who observe discussions, provide feedback, and share their views.

Importance of Seminars:

- Provide motivation and a rich learning experience.

- Evaluate learners' capabilities.

- Organize and create information effectively.

- Manage information dissemination and retrieval scientifically.

- Develop self-reliance and self-confidence in learners.

5.4.2.3 Discussion Method: Concept and Importance

Definition: The discussion method of teaching involves group activities where the teacher and students collaboratively define problems and seek solutions. It is a constructive process that enhances listening, thinking, and speaking skills.

Principles of Discussion:

- Clearly define and understand objectives.

- Teacher acts as a facilitator to guide the discussion.

✝ Prepare a detailed question outline.

✝ Group members should be well-prepared with basic knowledge of the topic.

✝ Leader guides and coordinates the discussion, keeping it focused.

✝ Record main points of the discussion.

✝ Encourage participation from all group members, including shy individuals.

✝ Properly conclude the discussion with a report.

Preparation and Conduct:

Orientation:

✝ Provide the discussion topic and clearly describe the question.

✝ Explain preparation requirements and how the discussion will be conducted.

Engagement:

✝ Create a conducive environment for discussion.

✝ Present clear questions and focus on the discussion.

✝ Start by defining terms and assisting students when necessary.

✝ Ensure each student has a chance to answer.

✝ Keep a progressive record and summarize or evaluate at the end.

Debrief:

✝ Allow students time to make notes and reflect on their learning.

Importance

✝ Focuses on learning rather than teaching.

✝ Encourages participation and democratic thinking.

✝ Promotes reflective thinking and self-expression.

✝ Generates interest among students.

Forms of Discussion:

✝ **Role Play:** Participants act out human relations problems and analyze them.

✝ **Participatory Learning Method:** Engages students in all stages of homework, projects, and exams.

✝ **Formal Group Discussion:** Small or large group discussions.

✝ **Panel Discussion:** Qualified individuals discuss a given problem.

✝ **Seminar:** Experts present information and guide discussions.

✝ **Symposium:** Informing an audience through structured presentations.

Discussion is a vital teaching method that benefits both teachers and students. It encourages active participation and critical thinking, helping students adjust to social situations and fostering a democratic learning environment.

5.4.2.4 Team Teaching: Concept and importance   Concept

Team teaching involves two teachers working together with a single class of students simultaneously. There are various models of team teaching, such as station teaching and parallel teaching, which can be tailored to meet the needs of different groups of learners. Key components for successful team teaching include both teachers working as equals, planning instruction collaboratively before and during the class, and receiving support from the school through feedback and professional development. When these components are in place, collaborative teaching effectively addresses the diverse needs of students in a classroom.

Team Teaching Models:

1. **One Teach/One Observe**: One teacher conducts the lesson while the other observes and takes notes.

2. **One Teach/One Assist**: One teacher leads the instruction, while the other assists students as needed.

3. **Station Teaching**: Teachers divide content and students into stations, and they each teach part of the content.

4. **Parallel Teaching**: Teachers split the class in half and teach the same content simultaneously.

5. **Alternative or Differentiated Teaching**: Teachers use different instructional strategies to address varied student needs.

6. **Teaming**: Both teachers share the responsibility of teaching the entire class equally.

Importance of Team Teaching:

• **Enhanced Learning Experience**: Provides students with varied perspectives and teaching styles.

• **Individualized Attention**: Allows for more personalized support for students.

• **Shared Expertise**: Combines the strengths and expertise of two teachers.

• **Flexible Grouping**: Supports diverse learners by enabling flexible grouping strategies.

• **Professional Development** Encourages professional growth through collaboration and shared feedback.

• **Increased Engagement**: Keeps students engaged with different methods and activities.

Team teaching fosters a rich, dynamic learning environment that benefits both students and teachers. It encourages active participation, supports diverse learning needs, and promotes continuous professional development.

5.4.2.5 Tutorial: Concept and importance

Tutorials are essential and included in the timetable. Although students are treated equally by the teacher, their cognitive abilities and attitudes vary. The tutorial method usually follows a lecture session and provides an environment for individualized instruction, which is crucial for maximizing student learning. Tutorials involve one-on-one interactions between the teacher and student, offering opportunities for practice and clearing doubts rather than just repeating book and lecture content. Teachers identify areas of difficulty for students and assign problems for practice.

Importance

- ✝ **Individualized Attention:** Tutorials provide personalized instruction, catering to each student's unique needs and learning pace.
- ✝ **Doubt Clearance:** Students can clarify doubts and receive immediate feedback.
- ✝ **Practice Opportunities:** Encourages repeated practice and reinforcement of concepts.
- ✝ **Enhanced Understanding:** Helps deepen students' comprehension of complex topics. V' **Skill Development:** Improves problem-solving and critical thinking skills.
- ✝ **Flexibility:** Can be adapted to any educational institution even without a formal timetable provision.

By incorporating tutorials, educational institutions can provide more focused and effective learning experiences, ensuring that each student receives the necessary support to succeed.

5.5 BENEFITS OF INSTRUCTIONAL SYSTEMS DESIGN

As noted in the introduction, the role of an instructional designer is to create an environment that supports learning, enabling learners to apply their newly acquired knowledge, skills, and attitudes across various contexts. The structured and informed use of learning theories and principles ensures the development of effective, learner-focused, and outcomes-oriented materials. This approach helps learners demonstrate improved performance in their jobs or achieve better graduation rates.

The primary benefit of instructional systems design (ISD) lies in its systematic approach to solving instructional challenges. ISD enables innovative solutions that transform learning problems into instructional plans, ensuring high-quality instruction. By focusing on achieving specific learning outcomes, ISD makes the objectives of instructional materials clear to all stakeholders, including learners, facilitators, administrators, employers, and parents. Performance standards and assessment criteria offer a reliable way to determine

whether these outcomes have been achieved. The process also includes revising and testing the learning materials thoroughly to ensure they meet the intended goals, thereby fostering confidence in their effectiveness. Additional advantages of ISD include:

- ✝ Supporting the planning, coordination, and management of tasks, roles, deliverables, timelines, and budgets, effectively aiding project management.

- ✝ Enhancing the effectiveness, efficiency, and appeal of instruction.

- ✝ Encouraging learner engagement and motivation.

5.6 CHECK YOUR PROGRESS

Q1. Explain the concept and key assumptions of Task Analysis in instructional design. How does it contribute to effective learning outcomes?

Q2. Compare and contrast the Lecture and Discussion methods as instructional strategies. What are their key advantages and limitations?

5.7 LET US SUM UP

The instructional design (ID) process is often depicted as linear, but in reality, it is usually iterative, with activities revisited as the project progresses. While ID aims to create external conditions conducive to learning, the actual learning remains the learner's responsibility. Designers can arrange external conditions to support the internal learning process, planning experiences that transform current behaviour, performance, and cognition into new, unlearned behaviors and mental processes to achieve learning outcomes. Additionally, not all learning results from intentional instruction; social behaviour and emotional learning are influenced by parents, adults, peers, and media, with daily life experiences continually shaping our attitudes and behavior.

5.8 KEYWORDS/GLOSSARY

Instructional design; Task Analysis; Instructional Strategies; Instructional Systems Design;

ADDIE Model; ASSURE Model.

5.9 SELF ASSESSMENT QUESTIONS

Q1. According to Gagné, what are the five key capabilities that learning should develop, and why is it important to integrate multiple capabilities in instructional design?

Q2. Develop a learning design for a topic of your choice.

5.10 SUGGESTED READINGS

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LESSON : 6

PROGRAMMED LEARNING

Structure

6.1 Introduction

6.2 Learning Objectives

6.3 Concept of Programmed Learning

6.4 Meaning & Definitions of Programmed Learning

6.5 Origin of Programmed Learning

6.6 Different Styles of Programming

6.7 Steps Involved in the Construction of Programmes

6.8 Check Your Progress

6.9 Let Us sum up

6.10 Keywords/Glossary

6.11 Self- Assessment Questions

6.12 Suggested Readings

6.1 INTRODUCTION

Programmed learning is a structured educational approach that emphasizes self-paced, individualized instruction through carefully designed instructional materials. This method aims to facilitate effective learning by breaking down complex content into manageable units, allowing learners to progress at their own pace. Learning, in this context, is seen as a dynamic process that involves changes in behavior and the acquisition of new skills through interaction with educational resources. In this unit, we will explore the fundamental concepts of programmed learning, its theoretical foundations, and its practical applications in various educational settings. Additionally, we will discuss the instructional strategies that enhance programmed learning, highlighting its role in creating a more personalized and effective learning experience.

6.2 LEARNING OBJECTIVES

After going through this unit, the learner will be able to–

  ✠ know the meaning and definition of programmed learning,

  ✠ understand the origin of programmed learning,

  ✠ understand the importance of programmed learning,

  ✠ explain the different styles of programming,

  ✠ describe the steps involved in the construction of programmes.

6.3 CONCEPT OF PROGRAMMED LEARNING

Programmed learning or programmed instruction stands for one of the efficient improvements in the learning process. As a highly individualized and organized instructional approach, classroom instruction, and self-learning or auto-instruction have been found quite useful. In a country like India, an attempt has been made for the use of programmed instructions particularly in providing material to the students of distance courses. Suitable self-instructional programmed materials for different subjects and grades have been prepared and it is being used for instructional or self-instructional purposes. Besides its use for instructional purposes, programmed instruction has full potential for being used as a mechanism of feedback device for the modification of teacher behaviour and improving teaching efficiency. Programmed learning is a teaching method that presents learning material in a logical sequence, intending to help students learn at their own pace and receive immediate feedback:

Programmed learning is an innovative instructional strategy rooted in behavioral psychology, specifically the principles of **operant conditioning** proposed by **B.F. Skinner**. It aims to enhance the teaching-learning process by ensuring that the learner actively participates in a structured sequence of activities. This method is considered one of the earliest examples of personalized learning and has significantly influenced the development of modern educational technology. Programmed learning is based on the idea that learning is best accomplished through small, incremental steps, with immediate reinforcement for correct responses. It's characterized by:

  • **Self-paced**: Students can work through the material at their own pace.

  • **Immediate feedback**: Students receive immediate knowledge of their results.

  • **Logical sequence**: The material is presented in a logical sequence.

  • **Repetition**: Concepts are repeated.

6.4 MEANING & DEFINITIONS OF PROGRAMMED LEARNING

In general, the instructions given by a teaching machine or programmed textbook is referred to as programmed instruction or programmed learning. Let us take into consideration the definitions put forward by the various academicians in understanding the meaning of the term programmed learning or programmed instruction.

Definitions of Programmed Learning

1. **B.F. Skinner (1958)**:

   "Programmed learning is a method of teaching which provides the learner with a carefully constructed sequence of steps to follow, allowing them to progress at their own pace with immediate feedback for reinforcement."

2. **L. Crowder (1960)**:

   "Programmed instruction is an educational technique in which material is presented in a sequence tailored to the responses of the learner, ensuring understanding through branching pathways."

3. **International Society for Technology in Education (ISTE)**:

   "Programmed learning refers to a systematic and technology-supported instructional design approach where content is divided into smaller units, promoting active engagement and immediate feedback for mastery learning."

4. **M.J. Lange (1967)**:

   "It is a self-instructional approach that uses structured material and logical steps, enabling learners to work independently and achieve understanding through guided reinforcement."

5. **Dececco and Crawford (1977)**:

   "Programmed learning is a self-paced, structured method of learning that ensures the learner responds actively to tasks, with instant feedback enhancing their understanding."

6. **Educational Technology Glossary**:

   "Programmed learning is an instructional methodology that utilizes sequenced content, learner participation, and immediate feedback to ensure gradual and effective knowledge acquisition."

6.5 ORIGIN OF PROGRAMMED LEARNING

Programmed learning emerged as a transformative approach to education in the mid-20th century, deeply rooted in **behaviorist psychology**, particularly the work of **B.F. Skinner**. Skinner's **operant conditioning theory** emphasized the role of reinforcement in learning, proposing that behaviors could be shaped through a systematic process of stimuli, responses, and feedback. In the 1950s, he introduced the concept of **teaching**

machines, devices designed to deliver instructional content in small, structured units called "frames." These machines required active learner responses and provided immediate feedback, reinforcing correct answers and facilitating mastery before progressing. This method, termed **linear programming**, aimed to ensure steady, incremental learning.

Building on Skinner's work, **Norman Crowder** introduced **branching programming**, which adapted the learning path based on the learner's responses. This approach provided remedial content for incorrect answers and allowed a more personalized and dynamic learning experience. Programmed learning gained prominence during and after **World War II** when the need for efficient training methods to quickly equip soldiers and workers with essential skills was paramount. Its systematic and scalable nature made it an ideal solution for addressing large-scale educational challenges.

As technology advanced, programmed learning transitioned from mechanical teaching devices to digital platforms. The 1970s saw its integration into **Computer-Assisted Instruction (CAI)**, where computers delivered interactive lessons aligned with programmed learning principles. By the 1980s and beyond, the method became the foundation of **Learning Management Systems (LMS)**, **e-learning platforms**, and **adaptive learning systems**, where artificial intelligence further personalized the learning experience. Today, programmed learning is evident in a variety of educational technologies, including **Massive Open Online Courses (MOOCs)**, gamified learning environments, and mobile apps.

The origin of programmed learning signifies a shift from teacher-centered to **learner-centered education**, emphasizing individualized instruction, active participation, and mastery learning. It represents the synergy between psychology and technology, laying the groundwork for modern instructional design. The method not only addresses the demand for effective and scalable education but also continues to influence contemporary practices, ensuring that learning is accessible, efficient, and adaptive to diverse learner needs.

6.6 STYLES OF PROGRAMMED LEARNING

Programmed instruction was introduced in the 1950s in classroom teaching and since then many styles of programming have emerged. The two main types which we will be discussing here are as follows:

1. Linear Style (Skinner's Approach)

A linear program is made up of a series of small instructional units known as frames. The subject matter is broken down into manageable segments for the learner. In this type of programming, all students follow the same predetermined sequence of frames, each consisting of brief sections. The learner begins at the first frame and continues through to the final frame.

Since the sequence is fixed and all students follow the same path determined by the programmer, linear programs are considered to be externally controlled. This approach allows students to progress at their

own pace, moving through a logical sequence of steps in the subject matter, starting from the first frame and continuing to the next. Each frame represents a distinct instructional unit.

Structure Overview:

- The **linear style** presents content in a fixed, sequential order.
- Each learner follows the same path, moving from one frame to the next in a predetermined sequence.
- After each frame, the learner responds, receives immediate feedback, and proceeds to the next frame based on their response.
- There is no deviation in the path, and learners progress at their own pace, but the sequence remains the same for everyone.

Components:

- **Stimulus:** A segment of information presented to the learner.
- **Response:** The learner's answer or reaction to the stimulus.
- **Immediate Feedback:** Correct or incorrect responses are addressed immediately, reinforcing the learning.
- **Next Frame:** The learner moves to the next frame, regardless of the correctness of the previous response.

Example:

1. Frame 1: "What is 2+2?"

   o Learner responds.

   o Immediate feedback is given (e.g., "Correct!" or "Incorrect, the correct answer is 4").

2. Frame 2: "What is 3+3?"

   o Learner responds.

   o Immediate feedback is given.

3. Frame 3: "What is 4+4?"

   o The learner proceeds in a fixed order.

2. Branching Style (Crowder's Approach)

The branching style of programming, introduced by psychologist **Norman Crowder** in 1954, is also known as the **Crowderian style**. It is a type of program designed to adapt to the individual needs of students

without relying on external devices like computers. This style was specifically developed to correct errors by providing remedial material, followed by instructions to return to the original content and make another attempt. As a result, students progress through the program along various routes or branches.

Branching programming is considered **intrinsic** because the learner makes decisions about adapting the instruction based on their prior knowledge of the subject. In this approach, a student reads a section of material followed by a multiple-choice question. If the student selects the correct answer, they proceed to the next paragraph and question. If the answer is incorrect, the student is provided with additional material to correct their understanding before moving on.

Structure Overview:

- The **branching style** adapts to the learner's responses, providing different pathways depending on the correctness of their answers.

- If the learner answers correctly, they continue down one path, while incorrect answers lead them to review or remedial content before progressing.

- The learner's experience is personalized, with the system branching into different sections based on their responses.

Components:

- **Stimulus:** The content presented to the learner.

- **Response:** The learner's answer or action in response to the stimulus.

- **Feedback:** Immediate correction or reinforcement is provided.

- **Branches:** Depending on the response, the learner is guided to different frames (correct answers lead to new content, incorrect answers lead to review or remediation).

Example:

1. Frame 1: "What is 2+2?"

   o Learner responds.

     ❖ **Correct Response** → Proceed to Frame 2: "What is 3+3?"

     ❖ **Incorrect Response** → Branch to Review: "Review: What is 2+2? The correct answer is 4."

2. After the review, the learner returns to Frame 1, where they answer again.

   o **Correct Response** '! Proceed to Frame 2.

3. The sequence continues, with different branches based on the learner's responses.

Key Differences:

- **Linear Style**: Fixed path with no divergence, learners follow the same sequence of frames.

- **Branching Style**: Flexible path with multiple possible routes based on the learner's responses, creating a personalized learning experience.

6.7 STEPS INVOLVED IN THE CONSTRUCTION OF PROGRAMMES

The programming process is dynamic, challenging, and requires significant time and effort. It necessitates expertise on the part of the programmer to develop effective programs. This process typically involves three key steps:

Step-1: Preparation

Step-2: Writing the Frames

Step-3: Evaluation or try out / revision

Now, let us discuss each stage in detail.

Step 1: Preparation Stage

Also referred to as the planning stage, this phase involves the teacher selecting a topic for the program. The teacher must have a deep understanding of the subject matter, clearly define the scope, and ensure the program's suitability. Objectives should be identified, followed by a detailed content analysis to structure the instructional process. Setting objectives involves specifying the learner's initial abilities (entering behavior) and the desired outcomes (terminal behavior) that the program aims to achieve. Additionally, a criterion test is developed to measure the learner's performance and evaluate whether the objectives have been met. Defining entering behavior ensures that the necessary prerequisites for learning the new skills and knowledge are clearly outlined.

Step 2: Writing the Frames

This stage focuses on designing, sequencing, and editing the program's frames. Each frame must include four essential components: the stimulus, the response, prompts or cues, and the confirmation of results. The **stimulus** is a small content segment presented within the frame, while the **response** is typically a blank space where the learner provides their answer. Together, the stimulus and response create a **stimulus-response (S-R)** relationship. Immediate feedback is given, with the correct response usually provided in the next frame, allowing the student to compare their answer and proceed if correct. **Prompts** are additional hints or cues added to make the stimulus clearer, aiding the learner in giving the correct response and avoiding unnecessary errors.

Step 3: Evaluation or Try Out/Revision

The final stage involves evaluating the program's effectiveness. Once the first draft is completed, it should be tested with a small group and revised accordingly. The frames should be typed with the responses on the reverse side for comparison. Mistakes made during the trial phase help identify areas for revision. There are two types of evaluation: **internal** and **external**.

- **Internal evaluation** involves field testing with 15-30 students, observing their responses and error rates, and using this data to revise the program. An achievement test specifically designed for the program is also administered to assess learners' progress.

- **External evaluation** assesses the program's effectiveness using broader criteria:

  o **90/90 Standard**: After testing on a small group, data is analyzed to determine if 90% of the students can correctly answer 90% or more of the program's frames. o **Cost Estimates**: Determines the production cost and the number of students the program can serve.

  o **Student Attitudes**: Evaluates how students perceive the program, which is crucial in determining its effectiveness.

These evaluation steps ensure the development of a high-quality program that is effective for both face-to-face and distance learning environments.

6.8 CHECK YOUR PROGRESS

1. Who introduced the concept of programmed learning?

a) B.F. Skinner

b) Norman Crowder

c) L. Crowder

d) M.J. Lange

Answer: a) B.F. Skinner

2. What is a characteristic of programmed learning?

a) It allows students to progress at a fixed pace.

b) It provides immediate feedback for correct answers.

c) It doesn't involve any feedback.

d) It follows a linear path without any adaptations.

Answer: b) It provides immediate feedback for correct answers.

3. What is the primary goal of programmed learning?

   a) To create an entertaining learning experience

   b) To provide a structured and individualized learning process

   c) To follow a predetermined path with no feedback

   d) To eliminate any human intervention in teaching

Answer: b) To provide a structured and individualized learning process

4. Who developed the branching style of programming?

   a) B.F. Skinner

   b) Norman Crowder

   c) M.J. Lange

   d) J.P. DeCecco

Answer: b) Norman Crowder

5. What is a key feature of the "self-paced" nature of programmed learning?

   a) Students are required to complete all tasks at the same time.

   b) Students can move through the material at their own pace, ensuring mastery before moving on.

   c) The teacher dictates the pace of learning for each student.

   d) There is no opportunity for students to receive feedback.

Answer: b) Students can move through the material at their own pace, ensuring mastery before moving on.

6.9 LET US SUM UP

- **Programmed Learning** is an instructional method that allows students to learn at their own pace, with immediate feedback and structured content.

- It is based on **operant conditioning** by B.F. Skinner, where learning happens in small, manageable steps.

- **Features**:

   o Self-paced learning

   o Immediate feedback

   o Logical sequence of material

   o Repetition of concepts

- **Types of Programming**:

  o **Linear Programming**: A fixed sequence where all students follow the same path.

  o **Branching Programming**: Adaptable path based on individual student responses.

- **Steps in Construction**:

  a. **Preparation**: Choose topic, set objectives, and analyze content.

  b. **Writing Frames**: Design small content units with responses and feedback.

  c. **Evaluation**: Test, revise based on student performance and feedback.

6.10 KEYWORDS/GLOSSARY

Programmed Learning; Linear Programming; Branched Programming

6.11 SELF ASSESSMEMT QUESTIONS

Q1. What is programmed learning, and how does it improve the learning process?

Q2. How does programmed learning allow students to progress at their own pace?

Q3. What are the key features of programmed learning?

Q4. Explain the concept of linear style in programmed learning.

Q5. What is the difference between linear and branching styles of programmed learning?

Q6. What are the three key steps involved in the construction of a programmed learning program?

Q7. How does the stimulus-response relationship work in a linear programmed learning frame?

Q8. What are the benefits of using programmed learning in distance education?

6.12 SUGGESTED READINGS

- Chauhan, S.S. "Advanced educational Psychology"

- R. P. Pathak & Jagdeesh Chaudhary "Educational Technology"

LESSON : 7

COMPUTER ASSISTED LEARNING (CAL) & COMPUTER MANAGED LEARNING (CML)- CONCEPT, PROCESS, MERITS AND DEMERITS

Structure

7.1. INTRODUCTION

Dear learners, as you are aware that educational technologies have a significant role in the contemporary educational settings. If, computer-based technologies are utilised to their full extent, they can help a teacher in making the teaching-learning process more effective than with the use of any other media. So, this unit will guide you through the dynamic world of Computer-based technologies like Computer Assisted Learning (CAL) and Computer Managed Learning (CML). We'll start by outlining learning objectives, ensuring a clear roadmap for your journey. In the first section lets understand the concept of CAL- process, merits, and demerits by shedding light on how technology can transform traditional learning environments. Similarly, you will explore the concept of CML, its operational mechanisms, benefits and limitations. The content for the same is as discussed in the paragraphs below:

7.2. LEARNING OBJECTIVES

After completing the lesson, learners will be able to:

✤ Explain the concept of CAL & CML.

✤ Distinguish between CAL & CML.

✤ Describe the processes involved in CAL and CML.

✤ Identify the merits of CAL and CML.

✤ Analyze the demerits of CAL and CML.

7.3 COMPUTER ASSISTED LEARNING (CAL)

7.3.1. Concept

Computer-Assisted Learning (CAL) refers to the use of computers and technology to facilitate and enhance the learning process. It encompasses a wide range of learning activities that make use of computer programs, online resources, multimedia and interactive tools to support education. CAL is an important aspect of modern education, offering personalized, flexible and often more engaging ways for students to learn.

Computer Assisted Learning (CAL) and Computer Assisted Instruction (CAI) involve situations where learners engage in interactive, two-way communication with a computer via a terminal. CAL encompasses activities where teaching and learning across the curriculum are enhanced by computer applications. The computer can act as a teaching aid or focus more on student-centered learning.

According to Barker (1988), the functions of CAL include:

1. **Management of Learning**: Organizing and managing the learning process.

2. **Testing**: Administering and evaluating tests.

3. **Tutoring**: Providing personalized tutoring to students.

4. **Exercising**: Offering practice exercises to reinforce learning.

5. **Use of a Computer as a Calculator**: Performing calculations to aid learning.

6. **Use of a Computer as a Laboratory**: Simulating experiments and practicals.

7. **Production of Technical Materials**: Creating educational and technical materials.

8. **Dissemination of Material**: Distributing learning materials.

9. **Archival of Material**: Storing educational content and records.

10. **Medium of Expression**: Allowing creative expression through computer-based tools.

This comprehensive approach ensures that CAL can support various educational objectives and enhance the overall learning experience.

Modes of CAL

The scope of CAL includes a wide variety of functions. These functions are usually realised in terms of a limited number of CAL modes. Computer-Assisted Learning (CAL) includes several modes that leverage computer technology to enhance the learning experience. These modes are:

1. **Drill and Practice**: The computer presents repetitive exercises and provides immediate feedback, allowing learners to practice specific skills and correct errors in real-time.

2. **Tutorial**: The computer divides a topic into manageable sections (frames), guiding the learner step-by-step. It adapts content based on the learner's progress, making it possible to navigate complex material without overwhelming the student.

3. **Dialogue/Conversational**: The computer engages in interactive conversations with the learner, simulating a teaching dialogue. It customizes the learning path based on the student's responses, though this requires sophisticated programming and is resourceintensive.

4. **Games**: Educational computer games integrate instructional content with fun, motivating students to actively engage with the material through competition or problem-solving, reinforcing concepts in an enjoyable way.

5. **Simulation**: Computers simulate real-life systems or phenomena that are difficult, expensive, or unsafe to explore directly. This allows learners to experiment and explore complex scenarios in a controlled virtual environment, offering immediate feedback and flexibility.

Each mode uses the computer's capabilities to enhance interactivity, flexibility, and engagement in the learning process.

7.3.2 Process of Computer Assisted Learning (CAL)

The process of the Computer Assisted Learning involves the following stages through which an effective instruction or the content is delivered to the students:

1. Content Creation and Development

The process of Computer-Assisted Learning (CAL) begins with creating educational materials tailored to the curriculum and learners' needs. This involves designing multimedia-rich resources such as videos, animations, simulations, and digital textbooks that make learning engaging and accessible. These materials are developed to align with specific learning objectives while ensuring they cater to different learning styles. Tools like Canva, Articulate and Adobe Captivate are commonly used for creating visually appealing and interactive content. For example, a science teacher might use 3D modeling software to create animations of biological processes, enabling students to visualize and interact with complex concepts via. the use of computer or computing-based devices.

2. Content Delivery via Technology Platforms

Once the content is developed, it is delivered to students through digital platforms that facilitate easy access and management of resources. Learning Management Systems (LMS) such as Moodle, Google Classroom and Blackboard serve as centralized hubs where students can access learning materials and participate in discussions. These platforms often integrate supplementary resources like e-books, virtual libraries and external links, offering students opportunities for deeper exploration of topics. For instance, a mathematics teacher might use Google Classroom to share instructional videos and practice exercises, enabling students to learn at their own pace.

3. Personalization of Learning Paths

Personalization is a key feature of CAL, allowing learning experiences to be tailored to individual student needs. Adaptive technologies play a central role in this stage, adjusting the pacing and difficulty of content based on a student's performance. These technologies ensure that learners who struggle with certain topics receive targeted support while advanced students can move on to more challenging materials. Individualized learning plans are created to address students' unique strengths and weaknesses. For example, DreamBox Learning adjusts its math problems dynamically, ensuring students receive personalized practice tailored to their progress.

4. Interactive Learning Experiences

Engagement is at the heart of CAL, and this stage focuses on creating active and immersive learning experiences. Interactive activities, such as gamified quizzes, virtual simulations, and hands-on virtual labs,

allow students to explore concepts in an engaging way. These tools foster curiosity and reinforce understanding by simulating real-world scenarios in a controlled, riskfree environment. For example, OLabs provides virtual experiments that enable students to mix compounds and observe reactions without requiring access to a physical lab. Similarly, platforms like Kahoot, Quizziz gamify quizzes, turning assessments into fun and competitive learning experiences.

5. Collaborative Learning Opportunities

Collaboration is an essential element of CAL, helping students develop teamwork and communication skills. Digital tools like Google Docs and Microsoft Teams facilitate group projects where students can work together in real time, regardless of location. Online discussion forums and virtual classrooms on platforms like Zoom provide spaces for interactive discussions and peer-to-peer learning. For instance, students working on a shared presentation can collaborate on Google Slides, brainstorming and editing content simultaneously. This stage not only promotes teamwork but also fosters a sense of community among learners.

6. Assessment and Feedback

The final stage in the CAL process involves evaluating student performance and providing constructive feedback to guide their learning. Regular assessments, including quizzes, tests, and assignments, are conducted to gauge student understanding. Tools like Socrative and Edmodo offer instant feedback, enabling students to identify areas for improvement immediately. Educators also analyze performance data to identify patterns and learning gaps, which helps in refining instructional strategies. For example, after completing a quiz on Kahoot, students receive instant feedback on their answers, helping them reinforce correct concepts and address misunderstandings effectively.

These stages ensure a structured and impactful approach to Computer-Assisted Learning. By focusing on content creation, personalized learning, interactivity, collaboration, and timely assessment, CAL creates an inclusive and engaging educational environment that prepares students for success in a technology-driven world.

7.3.3 Merits of Computer Assisted Learning (CAL)

Computer Assisted Learning (CAL) offers various advantages to both the learners as well as teachers in the following ways:

- ✞ CAL allows students to learn at their own pace, independent of others' performance, supporting self-directed study and skill development at various levels of difficulty.

- ✞ CAL presents information in a structured format.

- ✞ CAL requires active student involvement, in contrast to the passive nature of reading or attending lectures, enhancing engagement and learning.

✠ CAL provides instant feedback, which can be remedial or guide students to the next appropriate learning step based on their responses.

✠ CAL features a reporting system that helps students track their progress, identifying areas of improvement and mastery.

✠ CAL enables students to directly manipulate concepts and explore results, reducing the time required to understand difficult topics.

✠ CAL reduces the time teachers and students spend on repetitive tasks, such as creating and grading assignments, as the system handles these automatically.

✠ CAL offers multimedia experiences, such as audio, visuals, and animations, helping students understand complex concepts through engaging techniques.

✠ CAL allows for simulations of scenarios that are difficult, dangerous, or timeconsuming in real life, enhancing practical learning experiences.

✠ CAL offers a variety of multiple-choice questions and responses, with feedback provided for each option, enhancing the learning process.

✠ CAL provides repetitive drills that are helpful for students with lower aptitude, while allowing advanced students to progress quickly.

✠ CAL enhances students' reasoning and decision-making abilities by providing problemsolving opportunities.

✠ CAL encourages students to take responsibility for their learning, becoming more selfdirected, independent, and confident in their abilities.

7.3.4 Demerits of Computer Assisted Learning (CAL)

Although CAL offers number of advantages but it has some constraints as well.

✠ Developing CAL systems is costly, requiring significant staff time to create and program effective educational tools.

✠ CAL packages may be seen as novelties rather than integral parts of the educational process, potentially undermining the objectives they aim to achieve.

✠ Implementation of CAL required trained instructors who can synchronise the process of CAL.

✠ While simulations allow for virtual experiments, CAL lacks hands-on experiences such as handling equipment or working with machinery, which limits skill development.

✠ Content in CAL packages can quickly become outdated, and the high development costs make it difficult to update, leading to wasted resources if the course becomes irrelevant.

Conclusion

Computer-Assisted Learning (CAL) is a powerful educational tool that enhances engagement, personalizes learning, and provides immediate feedback to students. Its merits include flexibility, interactive experiences, and the ability to cater to individual learning needs. However, CAL also has limitations, such as the lack of hands-on experience, high development costs, and the risk of outdated content. Despite these challenges, CAL offers significant advantages in creating an interactive, self-directed, and efficient learning environment when implemented effectively.

7.4. COMPUTER MANAGED LEARNING (CML)

7.4.1. Concept

Computer Managed Learning (CML) refers to the use of computer-based systems and software tools to manage and facilitate various aspects of the educational process. Unlike traditional learning methods, CML focuses on automating and streamlining tasks such as tracking student progress, managing content delivery, assessing learner performance, and organizing instructional activities. Through the use of technology, CML aims to make education more efficient, personalized, and accessible.

Computer Managed Learning (CML) leverages technology to optimize educational administration and instructional management. At its core, CML involves using computer systems to aid educators in organizing, monitoring, and enhancing the learning experience. These systems manage the logistics of education, from tracking student progress and performance to providing insights for personalized learning plans. By automating and streamlining tasks such as scheduling, record-keeping, and resource allocation, CML frees up valuable time for teachers, allowing them to focus more on direct student interaction and support. Furthermore, the data collected through CML systems can be used to inform educational decisions, guide curriculum development, and offer targeted interventions, ultimately aiming to create a more efficient and effective learning environment.

While CAL emphasizes the role of computers in delivering instructional material, CML puts a stronger emphasis on administrative tasks that support both the teaching process and student learning. It also often includes features that allow teachers to track learner progress, customize learning paths, and ensure that students are progressing according to predefined educational standards.

Key Components of Computer Managed Learning

The key components of Computer Managed Learning (CML) encompass various aspects designed to enhance and streamline educational management. Here are the essential elements:-

  ✝ **Data Management:** This component is crucial for maintaining comprehensive records of students'

academic journeys. It includes collecting data on test scores, assignments, attendance, and other academic activities. The data is stored in a centralized database, which can be easily accessed and analyzed to monitor student progress, identify trends, and make informed decisions.

✝ **Curriculum Management:** This involves organizing the educational content in a systematic way. CML systems help in structuring the curriculum, ensuring that all necessary materials are available to both teachers and students. It allows for easy updates and modifications to the course content, keeping the curriculum aligned with the latest educational standards and requirements.

✝ **Assessment Tools:** These tools are designed to streamline the creation, administration, and evaluation of various assessments. Teachers can create custom quizzes, tests, and assignments that can be automatically graded. Instant feedback provided to students helps them understand their strengths and areas for improvement, facilitating a more effective learning process.

✝ **Scheduling and Timetable Management:** Efficient management of class schedules, resources and teacher assignments is vital for smooth educational operations. CML systems assist in creating and managing timetables, ensuring optimal use of resources such as classrooms, labs, and teaching staff, thus minimizing conflicts and maximizing efficiency.

✝ **Reporting and Analytics:** This component generates detailed reports and analytics to provide insights into student performance and overall educational outcomes. Teachers and administrators can use these reports to track progress, identify students who may need additional support and make data-driven decisions to enhance the learning experience.

✝ **Communication Channels:** Effective communication is key to a successful educational environment. CML systems provide platforms for messaging, notifications, and announcements, facilitating communication between teachers, students, and parents. This ensures that everyone stays informed about important updates, deadlines and events.

✝ **Resource Management:** Managing educational resources effectively is essential for providing quality education. CML systems help in tracking and organizing resources such as textbooks, digital content and laboratory equipment, ensuring that they are available when needed and used efficiently.

✝ **Personalized Learning Paths:** Tailoring educational experiences to meet individual student needs is one of the significant benefits of CML. Based on the data collected, CML systems can create personalized learning plans that cater to each student's unique strengths, weaknesses and learning styles, promoting a more individualized and effective educational experience.

7.4.2. Process of Computer Managed Learning

The process of Computer Managed Learning (CML) involves several systematic steps to ensure effective educational management and enhance the learning experience. Here's a detailed look at the process:

1. **Data Collection and Input:** The first step involves gathering comprehensive data on students, including their academic records, attendance, behaviour and other relevant information. This data is input into the CML system, forming the basis for all subsequent processes.

2. **Data Storage and Organization:** Once collected, the data is stored in a centralized database. This database is organized in a way that allows easy access and retrieval of information. The organization of data helps in managing it efficiently and ensures that the information is up-to-date.

3. **Monitoring and Tracking:** The CML system continuously monitors student progress and performance. It tracks various metrics such as grades, test scores, and participation in class activities. This tracking helps in identifying patterns and trends in student performance.

4. **Analysis and Reporting:** The data collected and monitored is then analyzed to generate reports. These reports provide insights into student progress, highlighting areas where students excel or need additional support. The analysis helps teachers and administrators make informed decisions.

5. **Personalized Learning Plans:** Based on the analysis, the CML system can create personalized learning plans tailored to each student's needs. These plans take into account individual strengths and weaknesses, ensuring that students receive the support they need to succeed.

6. **Resource Allocation and Scheduling:** The CML system also manages the allocation of resources such as textbooks, digital content, and classroom space. It helps in scheduling classes and assigning resources efficiently, ensuring that educational activities run smoothly.

7. **Assessment and Feedback:** The system facilitates the creation and administration of assessments, such as quizzes and exams. After students complete these assessments, the system provides immediate feedback, helping them understand their performance and areas for improvement.

8. **Communication and Collaboration:** CML systems enable effective communication between teachers, students, and parents. They provide platforms for sharing information, announcements, and updates, fostering collaboration and ensuring everyone is on the same page.

9. **Review and Improvement:** Finally, the process involves regular review and improvement of the CML system itself. Feedback from users is gathered, and the system is updated to incorporate new features, address issues, and enhance overall functionality.

7.4.3. Merits of Computer Managed Learning

Computer Managed Learning (CML) offers number of merits to the educational settings. Here are some of the key merits:

✝ **Personalizes Learning Experiences:** CML systems analyze student data to create customized learning paths tailored to individual needs. By addressing each student's unique strengths and weaknesses,

these systems provide a more effective and engaging learning experience that fosters individual growth and development.

✝ **Provides Immediate Feedback:** The real-time assessment and feedback capabilities of CML allow students to quickly understand their performance. Immediate feedback helps students identify areas where they need to improve and reinforces their strengths, promoting continuous learning and improvement.

✝ **Organizes and Accesses Student Data:** CML systems store all student-related data in a centralized, easily accessible database. This organization simplifies the process of retrieving and analyzing data, enabling educators to make informed decisions about student progress and needs.

✝ **Optimizes Resource Allocation:** Efficient management of educational resources such as textbooks, digital content, and classroom materials is a key feature of CML. By ensuring that resources are used effectively and are readily available when needed, CML enhances the overall learning environment and supports better educational outcomes.

✝ **Facilitates Better Communication:** CML provides integrated communication tools that connect teachers, students, and parents. These tools enable timely sharing of important information, updates, and feedback, fostering a collaborative and supportive educational community that enhances the overall learning experience.

✝ **Scalable for Growing Numbers of Students:** CML systems are designed to scale easily, accommodating increasing numbers of students and expanding educational programs. This scalability makes CML suitable for both small schools and large educational networks, providing flexibility and adaptability to meet the changing needs of educational institutions.

✝ **Enables Data-Driven Decisions:** The comprehensive analytics and reporting features of CML provide educators and administrators with valuable insights. These data-driven decisions help optimize teaching strategies, curriculum development, and resource allocation, ultimately enhancing educational outcomes and ensuring that resources are used effectively.

✝ **Promotes Accountability:** Detailed records of student performance and progress maintained by CML systems promote accountability among both students and educators. This transparency ensures that everyone is working towards achieving common educational goals and continuously improving the learning experience. By keeping all stakeholders informed and engaged, CML helps create a more accountable and goal-oriented educational environment.

✝ **Streamlines Administrative Tasks**: CML automates routine administrative duties such as tracking attendance, managing schedules, and maintaining records. This significantly reduces the administrative burden on educators, allowing them to dedicate more time and energy to teaching and interacting with students.

By leveraging these merits, CML systems create a more efficient, effective and engaging learning environment for both students and educators.

7.4.4. Demerits of Computer Managed Learning

Although CML is one of the best teaching-learning managing system now-a-days. But, certain limitations are still there that can hinder its effectiveness.

✞ Technical issues and unequal access to technology can limit the effectiveness of CML. Not all students have the same level of access to computers and internet, leading to disparities in learning opportunities and outcomes.

✞ Excessive reliance on CML can hinder social skill development and emotional support. The lack of face-to-face interaction may reduce opportunities for students to develop crucial social skills and receive personal guidance from teachers.

✞ CML can lead to distractions, cheating, and plagiarism. Students may be easily distracted by other online activities, and the anonymity of the internet can make it easier for them to engage in dishonest practices.

✞ CML's standardized approach may not cater to individual learning styles and lacks flexibility. This rigidity can result in some students not receiving the personalized attention and instruction they require to thrive.

✞ Implementing and maintaining CML requires significant financial investment. The costs associated with purchasing hardware, software, hiring technical staff, and training educators can be substantial, which may strain educational budgets.

✞ CML may not be suitable for all subjects and learning objectives. Subjects that require hands-on or experiential learning, like art and physical education, may suffer from a lack of practical, in-person instruction.

✞ CML can be less effective for learners who require hands-on or kinesthetic learning experiences. These learners benefit from physical interaction with learning materials, which CML cannot provide, potentially limiting their engagement and comprehension.

✞ The quality of CML content and instructional design can vary widely. Poorly designed programs can lead to ineffective learning experiences, and not all educators may have the skills or resources to create high-quality digital content.

7.5 CHECK YOUR PROGRESS

1. Which of the following is a primary benefit of Computer-Assisted Learning (CAL)?

a) Limited access to learning resources

b) Lack of personalized learning experiences

c) Enhanced student engagement and interactive content

d) Reduced feedback to students

2. What is a major limitation of Computer-Assisted Learning (CAL)?

a) High flexibility in learning schedules

b) Lack of hands-on experience in certain subjects

c) Real-time feedback on progress

d) Easy integration with existing curricula

3. Which of the following is a function of Computer-Managed Learning (CML)?

a) Delivering interactive content

b) Managing course materials and tracking student performance

c) Conducting hands-on experiments

d) Providing immediate feedback on learning tasks

4. Which of the following is an advantage of Computer-Managed Learning (CML)?

a) It provides a platform for students to create multimedia content

b) It allows educators to efficiently track and analyze student performance data

c) It requires minimal teacher involvement in the learning process

d) It eliminates the need for regular updates and improvements

7.6 LET US SUM UP

Computer Managed Learning (CML) represents a significant advancement in the way education is administered. By leveraging technology to automate administrative tasks and track learner progress, CML provides both educators and students with valuable tools for improving the learning experience. While CML offers several advantages, such as efficiency, personalization, and real-time feedback, it also comes with challenges like dependency on technology and privacy concerns. Nevertheless, when implemented effectively, CML has the potential to revolutionize the educational process, making it more organized, accessible, and data-driven. As technology continues to evolve, the role of CML in modern education will likely become even more critical in shaping the future of learning.

In summary, both Computer-Assisted Learning (CAL) and Computer-Managed Learning (CML) offer significant advancements in education. CAL enhances student engagement and learning outcomes through interactive, multimedia-rich content and personalized learning experiences, providing flexibility, accessibility, and immediate feedback. However, it requires substantial infrastructure and may present challenges in equitable access and teacher training. CML, on the other hand, streamlines administrative tasks, tracks student progress, and offers valuable data to help educators tailor their teaching strategies, improving efficiency and supporting individualized learning paths. While CML offers numerous benefits, challenges such as data privacy, system reliability, and the need for continuous updates remain. By integrating both CAL and CML, educators can create a dynamic, efficient, and effective learning environment that supports diverse student needs and prepares them for future challenges.

7.7 KEYWORDS/GLOSSARY

Computer Assisted Learning; Computed managed Learning; ICT Mediated Learning

7.8 SELF ASSESSMENT QUESTIONS

Dear learners, think back to your recent experience with a Computer-Assisted Learning (CAL) and reflect your thoughts on its effectiveness, benefits, and challenges and write it on in your reflective diary.

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LESSON : 8

CONCEPT ATTAINMENT AND INQUIRY TRAINING MODEL :MEANING, NATURE, FUNCTIONS & TYPES

STRUCTURE

8.1 INTRODUCTION

It is rightly said that "Teaching is not the cup of Tea for all."

Teachers who can enhance each student's learning capacity in their class are considered successful. A key component of good teaching and student learning is the development of a teacher-student connection. Good teacher-student interactions foster a feeling of community at school and motivate pupils to work together. When students are confined by their fear of failing, they gain the confidence to try new things and achieve. Teach the child to learn, to investigate, to think, and to ask questions. This is the newest idea in education. Instead of "know what," the focus is on "know how." Social change is happening very quickly in the modern world, and information is expanding at an incredible rate.

In an environment where their fear of failure prevents them from trying new things, students get the confidence to achieve. The latest educational theory teaches students to learn, to explore, to think, and to ask questions. The modern world is experiencing rapid societal change and an amazing rate of knowledge expansion. It is no longer believed that education is the process of producing a final product. Over the past two decades, a multitude of novel teaching and training methods have been developed, assessed, modified, and adapted to different teaching-learning situations. The model of education is a creative way of teaching. It is necessary to concentrate on adapting instructional methods to the latest developments in science and technology.

8.2 LEARNING OBJECTIVES

❖ To Enable & facilitate the ability of the students to think and talk fluently.

❖ To comprehend the key features and essential components of certain instructional models & approaches.

❖ To enable the students to understand and examine the nature & functions of Concept attainment model of teaching.

❖ To acquaint the students with the concept of inquiry training model of teaching.

❖ To cultivate the abilities necessary for the scientific methods.

❖ To help students learn how to use creative inquiry techniques.

❖ To help students to become more adept at thinking.

❖ To empower people to draw fact-based judgments.

8.3 MODELS OF TEACHING

Modern science is becoming increasingly abstract and complex. Therefore, implementing cutting-edge teaching strategies and tactics is essential to raising the efficacy and efficiency of scientific instruction. Knowledge

is expanding exponentially in our day and age. To guarantee that the information is retained for a longer duration and may be utilised in a variety of situations, students must be prepared to process it in a suitable and significant way. Hence teaching models are prepared to fulfill this objective. Teaching models are constructed to give teachers a framework or structure for structuring their lesson plans and improving their students' educational experiences. The primary goal of teaching models is to give educators a methodical way to organize and carry out successful teaching strategies in their classrooms. Since these models serve as the foundation for the indoctrination of teaching beliefs

8.4 MEANING OF CONCEPT ATTAINMENT MODEL

A systematic inquiry approach is used in the teaching technique known as concept achievement. The approach draws from the work of Jerome Bruner and colleagues (1977), who examined the effects of several factors on the concept-learning process. Concept attainment is a teaching style that encourages students to think critically and inductively in order to acquire new ideas. In this approach, students identify the characteristics of a group or category that has been supplied. Through a methodical process of investigation, the Concept Attainment paradigm encourages and helps students to comprehend & learn. topics by identifying qualities or significant aspects. This approach employs two sets of examples: Yes examples, which showcase the concept's features, and No examples, which do not. The Concept Attainment model is an effective method for instruction and learning. The methodology offers instructors the benefit of introducing and teaching new ideas in an active, inquiry-based, student-centered manner. Concurrently, the model as a learning method assists students in: Connecting previously learnt material with new information Critically evaluating, contrasting, and classifying information this model helps To improve comprehension and recall of an idea, consider and comprehend it from several angles.

8.5 CHARACTERISTICS OF CONCEPT ATTAINMENT MODEL OF TEACHING

❖ **Scientific Process:** A teaching model or an instructional model is a methodical process to change students' behaviour rather than a random collection of data. They are anchored in certain learning theories and presuppose certain things and make certain assumptions .

❖ **Learning result specification**: Every teaching model outlines the learning objectives in detail based on students' performance. There is a detailed description of what the learner will do after finishing an educational sequence. Hence All teaching models provide detailed information about the learning outcomes based on students' performance. After finishing an educational sequence, the learner will do a certain task. A detailed description of what the learner will do after finishing an educational sequence is provided

❖ **Environment specification**: This implies that each teaching model outlines in precise terms the learning environment circumstances in which students will pick up and acquire new skills and change

their behaviour in accordance with the model's focus.

❖ **Performance criterion**: A model outlines the necessary performance standards that students must meet. After completing particular instructional sequences, the learner would exhibit the behavioural outcomes that are outlined in the teaching model.

❖ **Operational specification**: Every teaching model outlines a mechanism that allows students to respond to and engage with the learning environment that is presumed to be created by the interaction of the activities in the model

8.6 FUNCTIONS OF CONCEPT ATTAINMENT MODEL OF TEACHING

❖ **Advice**: One of the practical functions of a teaching model is to clearly outline the duties of the instructor. Teaching is an activity that is regulated, goal-oriented, and scientific hence a good Teacher must have a thorough instructional design that enables them to meet the course's objectives.. In order to achieve the purpose of education, a teaching model therefore offers direction to both the instructor and the pupils.

❖ **Developing Curriculum**: A teaching model aids in the creation of curricula for various courses at various educational levels, which are then effectively transmitted by the instructor. We can say that Using a teaching model, teachers may create curricula for various courses at various educational levels that they can then implement.

❖ **Instrumental material specifications**: A teaching model outlines in detail the many kinds of instructional resources that the instructor may use to help the students develop the attitudes they want to have. The teaching-learning process may be improved in a methodical and scientific way with the use of a model, which eventually aids in management and development.

❖ **Improvement in teaching** : A model helps improve the teaching-learning process systematically and scientifically and ultimately helps in bringing positive outputs in teaching and learning process

8.7 TYPES OF CONCEPT ATTAINMENT MODEL

❖ Concrete or perceptual concepts vs. abstract concepts: Concrete concepts are tangible objects that can be felt and sensed by an individual, such as chairs and dogs. Their perceptual memory coding make them easier to remember and associate to words when heard. Concrete concepts in learning include addition and subtraction, which are examples of early educational arithmetic concepts. But abstract concepts deal with things like feelings, experiences, and personality traits. Some concepts stand out more than others on a scale. Abstract-concept learning assesses inputs based on rules and novelty using criteria such as same baseline and transfer performance, no replication, and novelty. Abstract concepts activate more parts of the brain than concrete concepts, which combine linguistic and visual information.

❖ Defined (or Relational) and Associated concepts :-Relational and associated concepts are words, ideas, and thoughts that have a universal definition. Common related words include food-dinner, left-right, and up-down. These concepts are crucial for children's comprehension and logic in conservation activities. Verbs and prepositions, such as these, significantly influence the way things are seen and can be translated into other languages. Associative concept acquisition, or functional concept learning, is the process of classifying stimuli into relevant categories based on shared reactions or results, regardless of perceptual resemblance.

❖ Concepts that are related and associated are words, ideas, and thoughts that have some kind of connection. Relational notions have a universal definition that connects them. Common related words are food-dinner , left-right, and up-down. Early childhood education teaches us these concepts, which are crucial for kids to comprehend. When doing conservation activities, these ideas are essential to our comprehension and logic. Relational words, such as verbs and prepositions, greatly impact the way in which things are seen. These words have a higher chance of fostering a broader comprehension of the subject and are transferable to other languages.

The person's viewpoint and prior experiences link related ideas. Classifying stimuli according to a common category is a component of associative concept acquisition, also known as functional concept learning. Words, ideas, and thoughts that are related in some way are called relational and associated notions. In a global definition, relational ideas are linked together. Up-down, left-right, and food-dinner are common relationship phrases. These concepts, which are taught to us in our early years, are crucial for kids to comprehend. These ideas are fundamental to our comprehension and logic when doing conservation activities. The understanding of objects is significantly influenced by relational words, such as verbs and prepositions. These words have the ability to translate into other languages and are more likely to produce a broader knowledge of the object. it is the process of classifying inputs according to a shared Regardless of perceptual resemblance, associative concept learning (also known as functional concept learning) entails grouping stimuli into relevant categories according to a shared reaction or result.

❖ Development of learning plans for concept achievement On the basis of situational data, complex concepts such as scripts and schemas organise smaller elements and are updated for comprehension. In contrast to schemas, which provide a sequence of stages for accomplishing a desired goal, scripts provide a set of steps to complete a task, like buying your CD.A form of active learning in education and learning is concept achievement. Thus, it is possible to accomplish idea attainment through the selection of learning strategies, techniques, and objectives.

❖ Inductive Versus Deductive Strategies :The idea attainment model developed by Bruner is an example of an inductive teaching technique. As we can see from the concept attainment model example, it involves giving students facts and asking them to evaluate the facts' attributes in order to develop

rules that relate to the concept in simple words we can say that it entails providing students with facts and asking them to assess the facts' qualities in order to formulate rules that are related to the idea However, the deductive form of education asks students to investigate the features after first presenting them with rules that relate to a particular topic. There are a number of advantages to the inductive model over the deductive one
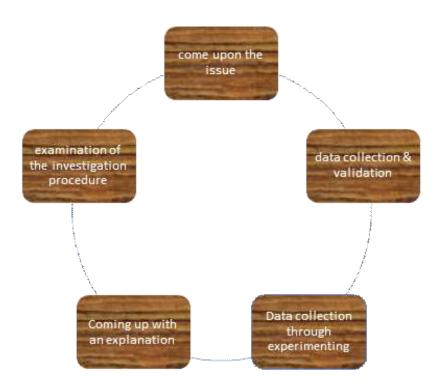
8.8 MEANING OF INQUIRY TRAINING MODEL

The Inquiry Training Model was developed by Richard Suchman. He employed this paradigm to instruct students in the process of looking into and interpreting odd occurrences by using this method. Scholars and philosophers attempt to arrange information and develop a number of principles in this paradigm. Suchman's model was created by analysing several approaches used by innovative researchers, especially physical scientists. He noted a number of components in their investigation procedure. He created an inquiry-based training approach based on this .According to the theory, people naturally probe when they are perplexed; they can become aware of and learn to evaluate their thought processes; they can actively seek out and incorporate new strategies into their existing ones; cooperative inquiry enhances thinking and teaches students about the tentative emergent nature of knowledge and how to value alternative explanations. According to the theory, people naturally seek answers when they are perplexed; they can become aware of and learn to evaluate their thought processes; they can actively seek out and incorporate new strategies into their existing ones; cooperative inquiry enhances thinking and teaches students about the tentative emergent nature of knowledge and how to value alternative explanations. The inquiry training paradigm places greater focus on raising awareness of and becoming proficient in the inquiry. This led him to create an inquiry training methodology. Students are put at the centre of the learning process with the Inquiry Learning Model, an active, student-centered approach is devised Inquiry training model is considered as student centered approach in which Students are encouraged to ask questions, investigate subjects, and actively participate in problem-solving and critical thinking as opposed to passively receiving knowledge through typical lecture-style. The goal of this strategy is to help and encourage students to acquire the intellectual discipline and skills necessary to pose questions and look for solutions that arise out of curiosity by encouraging the art of independent inquiry in a controlled fashion. Students learn about the provisional emergent nature of knowledge and how to value various answers through cooperative inquiry, which enhances thinking. The goal of this model is assisting students in acquiring the mental toughness and aptitude required to pose queries and look for solutions. He taught students how to look into and explain strange occurrences using this methodology. Scholars and philosophers attempt to organize knowledge and develop a number of principles in this paradigm. Suchman's model was created by analyzing several techniques used by innovative researchers, especially physical scientists. He pointed out many components of their investigation procedure. The Inquiry Learning Model is applicable at all educational levels, from elementary school to college. It fosters the development of critical thinking and problem-solving abilities in students

that are useful in both academic and real-world settings, as well as active, involved, and interested learners Following are the assumptions of Inquiry training Mode

- When people are confused, they naturally want to know so they start using inquiry approach.

- Students who are able to become aware of and learn to evaluate their thought processes follow inquiry traing model .

- Students' current tactics can be supplemented with new ones that are directly sought after.

 Students who wants to learn about the provisional emergent nature of knowledge use this model ,this also enhances thinking.

8.9 CHARACTERISRTICS

- ❖ **Exploration:** Inquiry training Model helps helps to get data and knowledge relevant to their issues, students do enquiries, research, and hands-on activities. This might include surveys, reading, experiments, or other data collecting methods.

- ❖ **Critical Thinking**: Through inquiry, students learn to think critically by assessing evidence, analyzing data, and coming to well-informed conclusions or judgments.

- ❖ **Problem-Solving**: Students are frequently given real-world issues or difficulties requiring innovative problem-solving techniques during inquiry-based learning. To create answers, students can work alone or with others.

❖ **Active Participation**: Learners engage in active participation in their education. They have to organise their activities, establish goals, and keep track of their progress with the help and support of this method.

❖ **Teacher Facilitation**: Although students participate more actively in inquiry-based learning, instructors are key players in this process. Teachers are essential as facilitators of inquiry-based learning. They assist in framing issues and concerns, providing resources, support, and guidance to pupils.

❖ **Reflection**: Students are urged to consider what they have learnt. They can become more proficient learners by strengthening their knowledge and honing their meta cognitive abilities through this reflection.

8.10 TYPES OF INQUIRY TRAINING MODEL

➢ **The Method of Structured Inquiry** :Students may learn how to ask questions and look into real-world issues by following the steps through the structured inquiry technique. This procedure of the structured inquiry approach teaches students how to pose enquiries and look into issues that arise in the actual world. Students are given an issue to research and are taught how to apply the scientific method to solve it. This kind of inquiry-based learning is frequently utilised in science programs

➢ **Open-Ended Inquiry Approach:** An approach to inquiry-based learning that is more flexible is the open-ended inquiry method. Students have the liberty to investigate their interests and pose enquiries on the subject matter they are learning in this kind of setting. In humanities classrooms, this kind of inquiry-based learning is frequently

➢ **The Question Model** :One of inquiry-based learning's simplest models is the question model. It entails questioning pupils about the material you are teaching. This will motivate students to consider the content critically employed, where students are expected to thoroughly investigate a subject and discuss opposing view .

➢ **The Problem-Based Learning Model :** The problem-based learning model is another excellent option for inquiry-based learning. This model involves giving students a problem to solve. They will need to think critically about the problem and find a solution. An approach to inquiry-based learning that focuses on problem-solving is known as a problem-based inquiry approach. Students are given a real-world challenge to address in this kind of approach. Students are expected to use what they have learnt to solve a current problem in Math's and engineering classrooms, which frequently employ this kind of inquiry-based learning.

➢ **The guided inquiry approach** :It is a teacher-led approach to inquiry-based learning. In this type of approach, the teacher guides the students through the inquiry process and helps them to ask questions and find solutions to real-world problems. This type of inquiry-based learning is often used in elementary

and middle school classrooms A method to inquiry-based learning that is directed by teachers is called guided inquiry

8.11 FUNCTIONS OF INQUIRY TRAINING MODEL

➢ **Improves Problem-Solving Skills:** By exploring real-world problems, students learn to think creatively and develop solutions.

➢ **Encourages Engaged Learning:** Active involvement in learning leads to better retention and deeper investment in the material.

➢ **Promotes Critical Thinking:** Students improve their critical thinking and problem-solving abilities by challenging material and coming up with original solutions.

➢ **Enhances Problem-Solving Skills**: Students get the ability to think creatively and come up with answers by investigating real-world issues.

➢ **Promotes Creativity:** Self-directed inquiry stimulates original ideas and inventive solutions.

➢ **Enhances Communication Skills**: Students' communication skills are enhanced when concepts are explained as they are solving problems.

➢ **Links Learning to the Real World**: By investigating real-world issues, students realise how classroom instruction relates to real-world situations.

➢ **Facilitates a Deeper Understanding of complicated Topics**: Practical investigation facilitates a deeper understanding of complicated issues.

8.12 CHECK YOUR PROGRESS

a) Name the Teaching Model which helps the students to think critically and inductively in order to acquire new ideas.

b) Write down few Characteristics of Concept Attainment Model which is useful in bringing Positive results in Teaching and Learning Process.

c) Elaborate Concrete and Abstract Concepts.

d) Define Richard Suchman Model of Teaching.

e) Why Inquiry Training Model is considered as student centric Approach.

f) Enumerate various characteristics of Inquiry Training Model.

8.13 LET US SUM UP:

It was determined that both the inquiry training model and the concept attainment model were appropriate

for fostering a scientific mindset. There is no difference in the formation of a scientific mindset between the Inquiry Training model and the Concept Attainment approach. Therefore, it can be concluded that various instructional styles are equally beneficial in helping students acquire these talents.An effective teaching method that stimulates critical thinking, keeps students actively involved, and connects classroom knowledge to real-world situations is inquiry-based learning. Teachers can implement the strategies and models outlined to create a dynamic and stimulating learning environment that encourages inquiry and in-depth understanding. According to research, the inquiry training paradigm can foster the growth of a positive scientific temperament. Both methods have the potential to lessen memory strain and rote learning. Additionally, the current study will help students cultivate a scientific mindset.

8.14   KEY WORDS/GLOSSARY

Concept attainment, Inquiry Training, Temperament, Paradigm, Inductive, specification

8.15   SELF ASSESSMENT QUESTIONS

Q1. Explain the term Models of Teaching?

Q2. Define Concept Attainment Model?

Q3. Briefly Discuss Inquiry Training Model ?

Q4. How Concept Attainment Model and Inquiry Training Model can be helpful to the learners .Elaborate this concept?

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LESSON : 9

GLASER'S BASIC TEACHING MODEL

STRUCTURE

9.1 INTRODUCTION

In today's world, social change occurs quickly, and knowledge expands at an astonishing rate.

Students develop confidence in an environment where their fear of failure prevents them from attempting new tasks. The modern educational theory instructs students to learn, investigate, think, and ask questions. The modern world is undergoing rapid societal transformation and unprecedented information expansion. Education is no longer seen as a means to an end. Over the last two decades, numerous novel teaching and training methodologies have been developed, assessed, adjusted, and used to a wide range of teaching-learning situations. The educational model is a novel way to teaching. It is important to focus on adapting teaching approaches to the most recent advancements in science and technology. Glaser model of teaching is innovative in the field of educational psychology to bring positive results in teaching and learning process.

9.2 LEARNING OBJECTIVES

- To Improve pupils' thinking and communication skills.

- Understanding the key aspects and components of Glaser,s model of teaching.

- To enable the students to comprehend and apply Glaser,s Model of Teaching.

- To strengthen children's critical thinking skills. By arousing interest and motivation among the students.

9.3 MEANING & NATURE OF GLASERS MODEL OF TEACHING

Robert Glaser In 1962, Robert Glaser created his Basic teaching methodology. It clarifies how teaching and learning are related. It offers a clear and sufficient conceptualization of the educational process. This model falls under the heading of psychological teaching models. The methodology can be used in practically any teaching and learning scenario because it is very planned and methodical. It describes the link between teaching and learning by providing a straightforward and appropriate conceptualization to the teaching process. The classroom setting is the most important component of education. Without a thorough understanding of teaching approaches, instruction fails to meet expectations. A teacher must stay up with the rest of the world. If a teacher's approaches are inappropriate, he or she cannot provide effective instruction. Teachers must understand individual differences and establish a relationship between the teaching-learning process and an individual's personality and cognitive development. Low cognitive ability is one of the most serious issues in schooling. Educational Technology has shown to be a blessing. It suggests that the teacher and the learner have direct communication. It suggests that the teacher's abilities are valued more highly than his character. Glaser Basic Teaching Model seeks to guarantee that students are actively involved in their education and are given feedback on their development. A teaching framework that prioritizes feedback and active engagement is the Glaser Basic Teaching paradigm, sometimes referred to as the "Teach-the-Teacher" paradigm. The Basic Teaching Model is an extremely useful tool for teachers in assisting students in the classroom to recognize, retain, and remember new learning materials. It is a tool for introducing the lesson topic and illustrating the relationship between what pupils will learn and what they have already learnt. The most broad thoughts about a topic are offered initially, followed by a gradual differentiation in terms of detail and specificity. Instructional materials are used to integrate new and previously provided knowledge by comparing and cross-referencing new and old ideas. An experimental study was undertaken to determine the effectiveness of the Basic Teaching Model over standard teaching techniques of education. It is known as the "Basic Teaching Model" because it offers a very basic breakdown of the teaching process in terms of its constituent parts. This concept is applicable to all educational levels, including primary, secondary, and higher education. Because a teacher can use this approach to teach other subjects, it is also used to subjects that are related to any other subject.With this model, you can teach for any amount of time. The Basic Teaching model separates the teaching process into four components or segments. It will be beneficial in multiple ways. It helps to organise the large corpus of information, thoughts, and principles.

9.4 CHARACTERISTICS OF GLASERS MODEL OF TEACHING

The Glaser approach contains specific instructional objectives that specify the learning outcomes for each lesson or unit. This enables customized education and assessment some of the important characteristics are as below:-

- Entry Behaviour Assessment: Glaser model of teaching helps the teacher to Identify students' past knowledge and capabilities to bring fruitful results in teaching and learning process so to tailor education accordingly glasers model is the right track.

- Structured Instructional Procedures: A comprehensive teaching plan that includes specific procedures, activities, and approaches for achieving learning objectives.

- Formative evaluation is continuous assessment throughout instruction to measure student progress, identify areas for support, and adjust teaching strategies accordingly.

- Unlike traditional examinations, performance-based assessment evaluates student learning through observable behaviours and practical applications of material.

- Feedback Loop: Providing students with regular performance feedback to promote future learning and improvement.

- Clear Instructional Objectives: Another important feature or characteristic of Glasers model of Teaching is that it emphasizes on Specific learning outcomes for each lesson or unit, which enables targeted instruction and assessment.

- The model outlines what students should be able to do and how their performance will be evaluated.

- The model represents the learning environment, including the classroom, and the connection between students and teachers.

- The model defines the responsibilities and connections between teachers and students, along with the norms that are fostered.

- The model explains how the curriculum is designed and how students learn from it.

9.5 (a) FOUR TYPES/COMPONENTS OF BTM

It divides the teaching learning process into four essential components:

- Instructional objectives.
- Behavior while entering
- Instructional methods
- Evaluating performance

Instructional goals: The instructional objective is the set of goals that the learner should achieve by the end of a unit of instruction. These goals might be described broadly, specifically, or in behavioural terms.To provide effective and systematic instruction, the objectives should be defined in behavioural terms.

Entering Behaviours: Similar to prior topic understanding or academic success.Before entering the teaching-learning process, every student exhibits some initial conduct.Before offering directions, it's crucial to assess the learner's behaviour. . This step is crucial because it allows the teacher to transition children from entry to terminal behaviours.

Instructional Procedures: It is the mo.It refers to the teaching technique, procedure, and strategies that are determined by the learner's objectives and entering behaviour.

Performance Assessments:This component is dependent on the previous two components. Here, the learner's ultimate behaviour is assessed in order to provide feedback. If necessary, objectives can be changed, instructional procedures enhanced, and performance assessments repeated. Assessment exams involve many methodologies such as observation, interviews, rating scales, and more.

All four essential components are linked to one another. They connect and impact one anothe

9.5 (b) ELEMENTS OF BASIC TEACHING MODEL

Glaser's Basic Teaching Model can be described by the following key elements:

Focus: This strategy outlines the primary actions that comprise the teaching and learning process. It also determines the lighting sequence that will be used during the teaching process.

Syntax: The actions in this model are performed in a sequential order, as illustrated below.-

(a) To begin, Bloom's Taxonomy is utilised to establish the goals to be reached.

(b) The student's comprehension and background are then judged by his or her entry behaviour.

(c) Following that, instruction is given to achieve the objectives while keeping the learner's entering behaviour in mind.

(c) The learner's ultimate behaviour is determined by using different types.

The Social System The model shows a teacher-dominated classroom atmosphere. The students here are attentive and appreciative of the educational programs. The effectiveness of this model is contingent on the teacher's ability and mastery in a variety of skills, including goal formulation, the implementation of appropriate tactics, evolution techniques, and so on.

Basic Reaction Principles: The reaction's main concepts are as follows.

a) Principles of interdependence: -The student's reactions must be understood and addressed in relation to the interaction, interdependence, process, and assessments.

(b) The notion of active participation:The teacher must be very active in order to properly execute this model. The approach necessitates active participation by the teacher from beginning to end. b) Follow-up principles: - Following teaching, an assessment is conducted. The teacher identifies gaps and weaknesses when the outcomes do not meet the established objectives. Then he attempts to mitigate the disadvantages by implementing corrective actions.

Support system: The instructor requires the following mechanisms for success.

(a) Proper environment: - A proper teaching-learning environment and scenarios are essential for the adoption of appropriate teaching tactics.

(b) Pre-service and in-service facilities: teachers must have access to suitable pre-service and in-service activities in order to develop the necessary abilities for applying this model.

(c) The availability of an adequate evolution device for assessing the students' entering and terminal behaviour.

9.6 FUNCTIONS OF GLASERS MODEL OF TEACHING

Individualized Learning: Teachers can adjust education to each student's requirements depending on their entering behaviors'. The idea is to guide learners through a series of steps or stages, focusing on mastery before progressing

Outcomes Focus :-Emphasizes the need for specific learning objectives to guide instruction and assessment. Uses performance evaluations to track student progress and alter instruction accordingly.The model emphasizes clear, measurable learning objectives. These objectives guide the teaching process, ensuring that each step of instruction has a clear outcome.

Systematic Approach: Provides a disciplined approach for planning and delivering teaching, taking into account all relevant components.

The model encourages students to actively participate in the learning process rather than passively receiving information.It stresses that learners should engage with the content, apply knowledge, and practice skills to achieve mastery.

The model proposes using highly structured, step-by-step teaching activities, ensuring that learners progress in a logical and systematic manner.

Continuous feedback is integral to the model. Teachers provide regular feedback to assess student progress and guide their learning.

Evaluation is both formative (ongoing) and summative (at the end), providing learners with clear understanding of their strengths and areas needing improvement.

Glaser's model incorporates reinforcement techniques to encourage correct responses and behaviors in learners. Positive reinforcement helps solidify knowledge and skills.

Reinforcement can be both verbal (praise) and tangible (rewards), promoting motivation.

The model takes into account the diverse learning needs of students. It allows for differentiated instruction based on the learner's abilities, ensuring that each student can progress at their own pace.

Focus is placed on the development of cognitive skills, such as problem-solving, analysis, and critical thinking.

9.7 CHECK YOUR PROGRESS.

✔ How does Glaser's model incorporate "Instructional Procedures"?

a) They serve as the last assessment of students' learning.

b) The pupils already know these things.

c) These are the techniques and approaches the instructor employs to direct instruction.

d) They decide on the educational goals.

Response is **C**

✔ In Glaser's paradigm, what is the main objective of "Performance Assessment"?

a) To assess the efficacy of the instructor.

b) To evaluate the entry behaviors of the students.

c) To assess the degree to which learners have met the learning goals.

d) To choose suitable teaching resources.

Response: **c)**

✔ According to Glaser's model, what is the significance of "Entry Behaviors"?

a) They are the teacher's initial impressions of the students.

b) They represent the students' prior knowledge and skills.

c) They are the final assessment of student learning.

d) They are the methods used for instruction.

Answer: **b)**

✔ What role does "Instructional Procedures" play in Glaser's model?

    a) They are the final evaluation of student learning.

    b) They are the students' prior knowledge.

    c) They are the methods and strategies used by the teacher to guide instruction.

    d) They determine the instructional objectives.

Answer: **c)**

✔ What is the primary purpose of "Performance Assessment" in Glaser's model?

    a) To determine the teacher's effectiveness.

    b) To assess the students' entry behaviors.

    c) To evaluate the extent to which students have achieved the instructional objectives.

    d) To select appropriate instructional materials.

Answer: **c)**

✔ Which of the following best describes the relationship between teaching and learning, according to Glaser's model?

    a) Teaching is a passive process, and learning is automatic.

    b) Teaching is a systematic process designed to facilitate learning.

    c) Learning is solely dependent on the student's inherent abilities.

    d) Teaching and learning are unrelated processes.

Answer: **b)**

9.8 LET US SUM UP

From the above we can sum up that Glaser's model is built to guide teachers in creating effective, goal-oriented lessons that ensure that learners achieve mastery in a structured, step-by-step way. The model is especially useful for achieving behavioral objectives and ensuring measurable student outcomes The model emphasizes the importance of guiding learners to higher-order thinking, helping them not just remember facts, but understand, apply, and analyze them. in this unit attempt has been made to revise our understanding of teaching - learning process which is being practiced by the learners. The basic steps have been discussed with the help of BTM.

9.9 KEY WORDS /GLOSSARY

Conceptualization, paradigm, cognitive ability, Entry behavior, formative evaluation, loophole, Bloom Taxonomy

9.10 SELF ASSESSMENT QUESTIONS

Q1. Define BTM / Glaser,s Model of Teaching.

Q2. Explain various elements of BTM.

Q3. State the use of Instructional objectives in Behavioural terms.

Q4. Enlist main components of BTM

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LESSON : 10

MICRO TEACHING –CONCEPT, IMPORTANCE, DIFFERENT TEACHING SKILLS, MICRO TEACHING SKILLS

STRUCTURE

10.1 Introduction

10.2 Learning Objectives

10.3 Meaning/Concept of Micro Teaching

10.4 Importance of Micro Teaching

10.5 Different Teaching Skills

10.6 Micro Teaching Cycle

10.7 Avantages & Limitation

10.8 Check your Progress

10.9 Let Us Sum Up

10.10 Keywords/glossary

10.11 Suggested Readings

10.1 INTRODUCTION

Microteaching is a common teaching approach in which teachers are permitted to improve their teaching skills by working on minor tasks. Micro teaching is a concentrated method of enhancing teaching approaches that enhances teachers' real-world teaching experiences. The term "micro teaching" refers to an organised procedure that assists teachers in refining their methods and approaches. Microteaching, which incorporates presentation and reinforcement abilities, enables beginner teachers to learn how to teach pupils or the art of teaching more easily. Microteaching has had a significant impact on a variety of subjects, including life sciences and health sciences. There is also a requirement to monitor teachers' skills in order to ensure continuous performance improvement. It plays a significant role in bringing qualitative Education by improving the quality of Education.

10.2 LEARNING   OBJECTIVES

➤ To provide teachers in training with teaching experience by simplifying classroom conditions.

➤ Identifying teachers' flaws and providing instant feedback to help them improve their behavior.

➤ To create innovative teacher education programs and to promote research into new teaching capabilities.

➤ Improve teaching by gaining more control over the instructional process and oversight.

➤ To help teacher trainees build confidence in teaching and mastering a number of teaching techniques on a small group of students.

➤ To acquaint the students with the concept of Micro Teaching.

➤ To bring qualitative improvements in Teaching Skills.

➤ To provide opportunities for self evaluation reinforcement abilities among student to courage student instructors to self-evaluate their abilities.

10.3 MEANING   &   CONCEPT   OF MICRO TEACHING

Micro-teaching is a method of teaching that involves analysis. Making teacher education programs scientific, successful, and relevant requires significant effort. It is now acknowledged as both a valuable teacher training technique and a versatile research tool. It was developed as part of Stanford University's teacher development program by Professors Dwight and Robert Bush between 1950 and 1960. It could be thought of as a miniature classroom setting. Micro-teaching is a novel technique that enables prospective teachers to get immediate feedback on their teaching talents and styles. It emphasizes on teaching under controlled conditions and can be regarded as a smaller-class-size, shorter-time teaching experience. With a small number of students and a short period of time, teaching becomes easier. Microteaching takes a simplified approach to reduce the complexities of the teaching process. Teaching is a complex activity that cannot be simplified in broad or rigid settings, but it may be carried out, taught, and evaluated using well-defined components. There are several verbal and nonverbal acts involved in teaching. Microteaching reveals that teaching requires a variety of abilities. Only after developing specialist abilities would a teacher be able to teach successfully. These teaching techniques can be improved with practice .Microteaching emphasizes practicing teaching under controlled situations using specialized teaching practices. It naturally improves the teacher's behavior and increases the effectiveness of the teaching-learning process. Microteaching should not be used in actual teaching because it is a scaled-down sample of teaching. For example, a driver will never let their trainee drive on the freeway during his first driving lesson. Begin with a less risky setting so that if the students make a mistake, no one is harmed. Thus, in order to appropriately handle the complicated act of teaching, it must be broken down into simpler components. The definition of micro teaching also emphasizes that this type of Microteaching learning focuses solely on one skill, 'how to teach', rather than 'what to teach'.

This ability is practiced, attempted, and developed throughout the whole learning session. This ability is rehearsed, tried, and developed throughout the learning session. It provides to teach the practice to teachers, where the customary complications are minimized.A student teacher delivers a five to eight-minute session to a small group of students, typically five to eight. A single topic is introduced, and at the end of the class, the pupil leaves, while the teacher trainee discusses his lesson with the supervisor. After then, the teacher trainee is given time to reflect on the discussion and alter his lesson plan accordingly. The student's teacher then teaches his micro-lesson with a different group of students under the same condition. Hence Micro-teaching is an exceptionally useful word used to improve a teacher's teaching skills as well as the learning abilities of students.

Definitions Many educators have given different definitions. Some of them are as below:

➢ **Bush** (1968) defined micro teaching as 'a teacher education technique which allows teachers to apply clearly defined teaching skills to carefully prepared lessons in a planned series of five to ten minutes encounters with a small group of real students often with an opportunity to observe the results on video tape.

➢ **Allen** (1976) micro teaching is a scaled down teaching encounter in class size and class time.

➢ **Singh, LC** (1977) micro teaching is a scaled down teaching encounter where a teacher teaches a small unit to a group of five pupils for a small period of 5-20 Such a situation offers a helpful setting for an experienced or inexperienced teacher to acquire new teaching skills and to refine old ones.

10.4 IMPORTANCE OF MICRO TEACHING

Microteaching is a flexible and multi faceted approach. It has been applied in a variety of sectors, including life science, business, and psychology. It focuses on 'how to teach', emphasizing controlled teaching settings and precise teaching behaviors. Every teacher would agree that micro-teaching is essential for professional development since it allows them to develop their knowledge, abilities, and professional attitudes. Micro -teaching is critical because it helps educators learn the necessary abilities. One of the most significant advantages of micro-teaching is that student-teachers focus on practicing a specific, well-defined skill. The micro-teaching cycle provides teachers with fast feedback that they can use right away. Micro-teaching allows student-teachers to practice their skills with a smaller number of pupils before teaching a larger group. It focuses on honing and strengthening certain teaching skills, as well as correcting faults. This helps children gain confidence and be ready for a wide range of educational circumstances. The micro-teaching cycle provides aspiring instructors with rapid feedback that they can use in their next round of teaching. There are numerous advantages to micro-teaching. Through the micro-teaching cycle, aspiring instructors can receive immediate feedback that they can use in the next round of teaching.

There are several advantages of micro-teaching.

➤ Micro-teaching helps build diverse skills in both trainees and teachers. It contributes in the development of a teacher's interpersonal skills.

➤ Enhances personality: Micro-teaching can build confidence. Micro-teaching includes a number of actions and techniques that considerably boost a teacher's confidence.

➤ Cost-effective: Micro-teaching is an affordable option. Teachers can practise in their classrooms or wherever else.

➤ Micro-teaching limits pupils to three-four at a time, emphasizing the importance of learning. As a result, it will helps to get greater teaching experience. It also lowers the risk of errors.

➤ Maintaining a positive mindset results in higher performance. As a result, one of the program's goals is to assist trainees in developing a constructive attitude towards criticism. This is a big advantage of microteaching.

➤ Promotes systematic lesson preparation: Effective lesson planning is an important skill for instructors to learn. A micro-teaching method inside a certain curriculum assists the trainer in meticulous lesson planning.

10.5 CONCEPT OF MICRO TEACHING SKILLS

Micro teaching is a teaching method that involves observing and evaluating the work of a student teacher in a simulated classroom setting. The purpose of micro teaching is to help teachers become more effective and confident in their teaching methods.

There are numerous micro-teaching skills & techniques. The five most useful micro-teaching abilities/skills are:

➤ Blackboard writing ability

➤ Reinforcement skills.

➤ Ability to ask probing questions.

➤ Explanation skills

➤ Stimulus variation abilities

Blackboard writing ability :-It helps to organise materials more effectively. It makes the content more visually appealing. It aids in keeping students' attention during lectures. The elements of the blackboard writing skill set. Handwriting legibility is determined by readability and letter size. The lines should be spaced sufficiently apart. Neatness in the blackboard work: This relates to the neatness of blackboard work.

Lines should be written in the proper sequence. Appropriateness of written work: The board should be filled with relevant and high-quality information. The chalkboard's points should be appropriately related. Illustrations and diagrams: Illustrations and diagrams keep students engaged in the subject. These should be pertinent to the issue.

Reinforcement Skill :-It is used to promote positive conduct and abilities. Reinforcement can be positive or negative. However, in most educational circumstances, we only use positive reinforcement. The teacher should provide reinforcement in a systematic and appropriate manner. The strengthening area's skill components. Positive Verbal Reinforcement: If the student's response is correct, the teacher may provide positive verbal feedback. Positive verbal feedback may include phrases such as "very good" and "excellent." • Good job. • Correct. Positive nonverbal reinforcement: Smiling, making positive gestures such as thumbs up, and employing facial expressions are some examples. Utilize extra verbal cues: Examples are: • Hmm • Aha.

Ability to ask probing questions :-Teachers ask pupils such questions to help them improve critical thinking and reasoning skills.

The following are the components of probing question skills:

a. Prompting: The teacher asks questions that allow the students to respond.

b. Re-directing: This is utilised following a promotion. When a student provides an inaccurate answer, direct the question to other students.

c. Re-focusing: It is utilized to connect the provided solution to previously addressed topics.

d. Seeking further information:- The teacher asks questions in order to elicit additional information from previously provided answers.

a. Increasing critical awareness: To increase students' critical awareness, teachers ask 'why' and 'how' enquiries.

Ability to Explain :-It is used to demonstrate a thorough mastery of the topic matter. The goal is to make the learning process more accessible and enjoyable for all learners.

Components of the competence of explanation include:

a. Introductory statement:- To familiarize students with the notion, a teacher introduces the issue in a few statements.

b. Use explanatory links: This component is used to connect distinct sentences. For example, as follows: In order for, etc.

b. Use of visual techniques: The teacher explains the topic to students using graphs, charts, maps, and other visual aids.

d. Technical words defined: The teacher should define technical terms in a clear and concise manner. Examples of technical terms include respiration, mutation, photosynthesis, eclipse, etc. Covering critical points: The teacher should go over all of the issue's key points.

b. Assessing pupil comprehension:- During the lecture, the teacher should ask students questions to determine whether or not they understand the material.

f. Concluding statement: The teacher ends the session with this statement.

Skill of stimulus variation

Its purpose is to break up the monotony of the educational atmosphere, making it more engaging and exciting.

Components of the skill of stimulus variation include:

a. Movement:- The teacher's purposeful movements in class assist him communicate with the kids better.

b. Gesture: The teacher should employ various gestures when teaching. These motions can include head movements, among other things.

b. Change in voice pattern:- Teachers should vary their speech pattern during the presentation. It helps to increase the class's attention and focus.

d. Focussing:- It is used to direct the students' attention to a certain point.

a. Change in interaction: There should be variations in the interaction between the students and the teacher.

10.6   Micro Teaching Cycle

Microteaching follows a circular process. This training method allows teachers to improve their teaching skills through repeated rounds of instruction and instant feedback from their colleagues and supervisors. To describe the micro-teaching cycle, we must examine each stage in depth. Let's look at the steps:

➢ **Plan** :-The first step in the micro teaching cycle is to plan. During the planning stage, you will first describe the micro teaching cycle to the teacher trainee. They are provided a quick overview of the micro teaching process, the skill to be practiced as part of the micro teaching session, and the strategies and requirements for implementing these techniques. The objective and components of the talent are frequently stated. The goal and components of the talent are also discussed, usually via the use of appropriate examples. This is typically accomplished through an open discussion. Once the skill to be demonstrated is identified, the trainee teacher creates a brief lesson plan (a micro lesson) that outlines particular objectives. The lesson plan must be created in a way that thoroughly and sufficiently displays the skill to be improved. For example, if the trainee demonstrates the ability to write on a blackboard, they must select a topic that allows them to make the most of the chalkboard,

such as the photosynthetic cycle or the five senses of the body. The lesson plan will be prepared based on the pupils' age and aptitude.

➢ **Teaching** After completing the first step of the micro teaching cycle, the teacher delivers the lesson and demonstrates the skill. Using the same example as before, the teacher displaying the blackboard skill will proceed to draw the photosynthetic cycle on the blackboard while explaining it to the classroom, which comprises of peers acting as students. This micro-teaching process takes roughly 5-7 minutes. Additionally, each trainee teacher is assigned 1-2 supervisors to assess their performance. It is also feasible to videotape the demonstration so that the trainee teacher may review it later and identify areas for development as well as those that the class responded to the most.

➢ **Provide feedback.**The outcome of the micro teaching cycle is heavily reliant on feedback from peers and supervisors. After delivering a class and demonstrating the requisite skills, the supervisors provide thorough evaluation on the trainee teacher's strengths and deficiencies. In the photosynthesis example, feedback could indicate that the trainee's handwriting was unclear. Another possibility is that there was a lot of eye contact and vocal modulation, which kept the kids engaged. In this situation, a recording of the micro teaching session would be beneficial since it would highlight the trainee the most effective portions of their lesson as well as their weaknesses in skill display.

➢ **Comments**:-The micro-teaching cycle's outcome is heavily influenced by feedback from peers and supervisors. Once a session has been taught and the requisite skills have been demonstrated, the supervisors provide thorough evaluation on the trainee teacher's strengths and faults. In the photosynthesis example, some comments may indicate that the trainee's handwriting was unclear. Another possibility is that there was a lot of eye contact and speech modulations, which kept the kids interested. In this situation, a recording of the micro teaching session would be beneficial because it would show the trainee the most effective portions of their lesson as well as their weaknesses in demonstrating the skill.

➢ **Reteach** :After making the necessary revisions to the lesson plan, the trainee is assigned a new group of peers. The teacher will demonstrate the same technique to the new group.

➢ **Re-Feedback**After completing the class, the learner receives feedback with the same level of information and precision. It is the supervisor's obligation to guarantee that the trainee receives appropriate and helpful feedback. If specific aspects need to be changed, the microteaching cycle is resumed from the planning stage.

The microteaching cycle is performed several times until the trainee masters the relevant skill. A micro-teaching cycle over time will assist the pupil build proficiency in the skill being presented.

10.7 ADVANTAGES & DISADVANTAGES OF MICRO TEACHING CYCLE

A micro-teaching cycle has benefits such as allowing teachers to focus on specific abilities, receive fast feedback in a controlled context, and build confidence by practicing in a low-stakes setting;

Benefits of a micro-teaching cycle:

- Targeted skill development: Teachers can focus on strengthening a single teaching skill at a time, providing for targeted practice and feedback.

- Small-scale settings provide immediate feedback from peers or supervisors, allowing for speedy adjustments and progress.

- Confidence building: Practicing in a low-pressure situation with a small number of pupils can boost teachers' confidence.

- Micro-teaching promotes systematic lesson planning, requiring teachers to create comprehensive and structured plans.

- Encourages experimentation with new teaching methods and practices in a secure environment.

- Micro-teaching is cost-effective due to its small scale, requiring minimum resources for implementation.

- Suitable for pre-service and in-service teachers.

Can be utilised to improve teaching abilities at different stages of a teacher's career.

Limitations of a Micro-teaching Cycle:

- Unrealistic classroom dynamics: Small class sizes and controlled environments may not effectively reflect the problems of a diverse classroom.

- Limited subject scope: Focussing on a particular skill or limited area may not adequately educate instructors for a comprehensive curriculum.

- Micro-teaching sessions may focus on surface-level instructional behaviours, perhaps leading to shallow practice.

- Limited topic scope: Focussing on a single skill or narrow content area may not adequately prepare instructors for a multifaceted curriculum.

- Micro-teaching sessions may prioritise surface-level behaviours over deeper learning if not appropriately designed.

- Planning, observation, feedback, and re-teaching can be time-consuming, especially with a big group of trainees.

- Effective feedback requires trained observers to make constructive and detailed critiques.

Why Micro-teaching may not adequately educate teachers to manage complicated classroom behaviours.

10.8 CHECK YOUR PROGRES

❖ Who first used the term Micro Teaching.

❖ Elaborate the objective of Micro Teaching.

❖ Microteaching as a scale down teaching encounter in class size and period." who said this statements

❖ Enlist five R's of Micro Teaching.

10.9 LET US SUM UP.

Microteaching is thus a teacher training technique that lowers the teaching environment to simpler and more controlled interactions by limiting practice teaching to a certain skill and shortening teaching times and class sizes. The ability to give and receive constructive feedback with an open mind, as well as to achieve appropriate teaching-learning goals, is the most significant characteristic of micro teaching session participants. It also boosts the teacher's self-esteem in a welcoming environment. It contributes to the necessary changes in pupil teachers. The behaviors are measurable and teachable. Thus, we can conclude that micro-teaching can be employed for mastery of teaching abilities and to improve the teacher behavior.

10.10 KEY WORDS AND GLOSSARY

➢ **Teaching**: Teaching is an interactive activity designed to attain specific goals and objectives.**Learning**: Learning refers to the ability to adjust one's behaviour, make errors, create habits, gain knowledge, and benefit from prior experiences.

➢ **Teaching talent**: A teaching skill is defined as a set of teacher behaviours that are especially effective in eliciting desired changes in student-teachers.

➢ **Integration of teaching skill:** Integration of teaching skill is the process of selecting, arranging, and employing a variety of teaching abilities to build a successful pattern for attaining the intended instructional objectives in a specific teaching earning situation.

➢ **Teaching Simulation:** Micro teaching is "teaching-simulation", meant to boost your confidence before you teach for real for the first time

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LESSON : 11

FLANDERS INTERACTION ANALYSIS & SIMULATION:-NATURE, PROCEDURE, ADVANTAGES & LIMITATIONS

STRUCTURE

11.1 Introduction

11.2 Learning Objectives

11.3 Meaning & Nature of Flanders interaction analysis

11.4 Procedure of Flanders Interaction Analysis

11.5 Avantages & Limitation

11.6 Check your Progress

11.7 Let Us Sum Up

11.8 Keywords/glossary

11.9 Self assessment questions

11.10 Suggested Readings

11.1 INTRODUCTION

Any educational system relies heavily on teachers. The success of any teaching learning process is determined by the techniques or paradigms that the teacher uses. Efforts can be traced back to the turn of the century, when industrial efficiency peaked. The qualities or behaviours of instructors, as measured by rating scales, and student accomplishment have been the most commonly utilized indicators of effectiveness. Over the last decade, many scholars have tried to identify excellent teachers by closely studying classroom behavior. The Flanders System of Interaction Analysis (also known as the Flanders) was the most extensively utilized system. The Flanders Interaction Analysis technique seeks to assess whether a teacher approaches motivation and control in the classroom indirectly or directly. The methodology used to define rather than evaluate teacher behaviors in the order in which they occur, across any topic and at any level. It does not, however, address nonverbal behaviors or interactions between students.

11.2 LEARNING OBJECTIVES

➢ To assess the dynamics of a classroom by analyzing patterns of teacher-student interaction,

➢ To teach instructors about Flanders interaction analysis.

➢ To enhance the quality of teaching skills.

➢ To boost motivation throughout the teaching and learning process

➢ To improve teaching by gaining greater control and oversight over the instructional process.

➢ To assess the dynamic of a classroom by looking at patterns of teacher-student interaction,

11.3 (a) MEANING & NATURE OF FLANDERS INTERACTION ANALYSIS

"Teaching as an interactive process. Interaction means participation of teacher and students in the process of teaching"

The teaching-learning circumstances in the class-room involve contact between the teacher and the pupils. The effectiveness of a teacher's instruction, which can be objectively evaluated by looking at how he interacts with students or behaves in the classroom, can be used to determine how successful he is. As a result, a methodical or impartial examination of the teacher's interactions with the students could offer a trustworthy evaluation of the teaching and learning that takes place in the classroom. Teachers' and students' verbal interactions in the classroom are categorized using the Flanders system, an observational method. Non-verbal cues are not taken into consideration because Flanders' instrument was created solely to observe spoken communication in the classroom. Non-verbal cues are not taken into consideration because Flanders' instrument was created solely to observe spoken communication in the classroom. The potential of interaction analysis as a training tool for teacher preparation is still being investigated, despite the fact that it has shown itself to be a very practical and objective observation method for measuring classroom occurrences. There are eleven categories in the FIACS. The first seven are used to record teacher speech, the next two are used to record student speech, and the final one is used to record classroom silence or misunderstanding. Because verbal behavior is more reliable to monitor than nonverbal behavior, the FIACS just looks at verbal behavior. It is assumed that a person's verbal behavior is a sufficient representation of his overall behavior. Non-verbal cues are not taken into consideration because Flanders' instrument was created solely to observe spoken communication in the classroom. The potential of interaction analysis as a training tool for teacher preparation is still being investigated, despite the fact that it has shown itself to be a very practical and objective observation method for measuring classroom occurrences. There are eleven categories in the FIACS. The first seven are used to record teacher speech, the next two are used to record student speech, and the final one is used to record classroom silence or misunderstanding. Because verbal behavior is more reliable to monitor than nonverbal behavior, the FIACS just looks at verbal behavior. It is assumed that

a person's verbal behavior is a sufficient representation of his overall behavior.

Flanders Interaction Analysis" refers to an observational method developed by Ned Flanders that analyses classroom interactions by categorizing verbal behaviors of teachers and students, allowing researchers to assess the dynamic of a classroom by looking at patterns of teacher-student interaction, particularly whether a teacher employs a more direct or indirect teaching approach; simulations using this method would involve recreating classroom scenarios Over the last decade, many academics have attempted to identify good teachers through rigorous observation of classroom behaviors. The Flanders System of Interaction Analysis (hereinafter referred to as the Flanders) was the most often utilized system. The Flanders Interaction Analysis technique is designed to identify whether a teacher approaches motivation and control in the classroom indirectly or directly. The methodology use to define rather than evaluates teacher behaviors in the sequence in which they occur, in any subject and at any level. In 1959, Flander proposed this measure for teacher effectiveness and student wellbeing. This strategy is particularly useful for verbal behavior and class communication. Communication between the student and the teacher is usually verbal rather than nonverbal. Flanders thought that the class's verbal behavior reflected the class's overall conduct. The teacher influences the pupils, and students interact with the teacher. Verbal behavior can be studied with great accuracy using Flanders' Interaction Category System. Flanders separated entire verbal behavior into ten categories, making teaching more enjoyable and pleasurable.

11.3 (b) CHARACTERISTICS

Improve verbal interactions in the classroom.

➢ Teachers can engage students more effectively.

➢ Teachers can move from direct to indirect behavior to better align with democratic values.

➢ Tape recorders and videotapes can be utilized to record classroom activities. The student can encode and decode his own actions.

➢ This technique can be coupled with other feedback tools, such as micro-teaching and simulated instruction.

DEFINITIONS

➢ **Thakur's view**: According to Dr. S.K. Thakur, class-room interaction analysis "may be defined as an instrument which is designed to record categories of verbal interaction during, or from, recorded teaching learning sessions. It is a technique for capturing qualitative and quantitative dimensions of teacher's verbal behavior in the class-room."

➢ **Ruhela's view**: Dr. Satya Pal Ruhela, in his book 'Educational Technology' writes that class interaction analysis may be conveniently divided into two parts: (i) verbal interaction (ii) non-verbal interaction

Investigators studied: (1) Teacher-pupil interaction (2) Pupil-pupil interaction (3) Interaction with various materials

11.4 PROCEDURE OF FlANDERS INTERACTION ANALYSIS & SIMULATION.

➢ The observer sits in a prime location in the classroom for optimal hearing and visibility.§

➢ After every three seconds, he selects the category that best represents the recently completed communication events. Thus, the time required to code one tally every 3 seconds is 20 tallies in one minute, 100 tallies in five minutes, and 1200 tallies in an hour.

➢ This step merely records the serial numbers of the categories.

➢ The observer records the serial number of each category on the data sheet.

➢ After the observation, the observer moves to another room and prepares details based on the serial numbers of the categories.

➢ Observation involves writing serial numbers.

➢ Encoding refers to the procedure of writing serial numbers for each category during observation.

➢ Decoding is the process of writing behaviour details based on categories.

➢ Observers should recall the serial numbers for these categories

11.5 ADVANTAGES AND LIMITATIONS

Advantages

➢ It effectively assesses the social-emotional atmosphere in the classroom.

➢ It's also used by in-service teachers.

➢ It provides feedback to students and teachers.

➢ This method is objective and reliable for observing classroom teaching.

➢ The content focuses primarily on teacher-led discussions.

➢ It compares instructor behavior across age ranges, genders, and subjects.

➢ It is effective for team teaching and microteaching.

➢ It is considered as a Scientific technique

➢ Flanders system helps in Systematic recording

➢ Teacher can make a Analysis of class-room behavior with this strategy.

➢ It acts like a Representative of class-room behavior

- Flanders system is a sort of Observation technique to study class-room behavior

- It is a tool for Measuring instrument for class-room teaching   & Evaluative device

- It is a one of the Feedback device to get feedback from students

- Last but not least it is very significant for theory of teaching

Limitations

- Preparing a 10 x 10 matrix takes time and is necessary for interpretation.

- Pupil-talk has received less attention.

- Observers need to be trained to code correctly.

- There is no interaction between different types of students in the classroom.

- Not useful for non-verbal behavior

- Narrow structure of teaching behavior

- No balance in categories

- No information about content

- No place for pupil-pupil interaction

- No place for recording reactions

- No value of certain judgments

11.6 CHECK YOUR PROGRESS

I. Name the Method which was propounded by Flanders to bring effectiveness in teaching and to create motivation in classrooms.

II. Enlist Three categories of Flanders Interaction Analysis.

III. Flanders separated entire verbal behavior into how many categories to make teaching more enjoyable and pleasurable.

IV. What do you mean by the term Simulation.

V. Write down any one definition of FIA.

11.7 LET US SUM UP

To summarize, Flanders interaction analysis is an innovative paradigm in the field of teaching and learning that assists teachers in arousing motivation and strengthening the learning process. It is the process of

encoding and decoding a pattern of interaction between the communicator and the receiver, which assists the instructor in analyzing student behaviors and generating fruitful interactions during instruction. Ned A. Flander's 1959 Interaction Analysis system consists of ten category systems. Three circumstances are expected to occur during the classroom encounter. 1. The speech of the teacher, 2. The speech of the pupils 3. Silence or confusion. It is a systematic, impartial procedure that enables evaluation of teachers' classroom behavior. This enables the recording of spontaneous spoken statements in the classroom. Information about lesson planning, the use of instructional materials, etc., is not recorded using this method. This facilitates the recording of teachers' spoken behavior, which is more reliable than their nonverbal cues. The words that teachers use in the classroom are thought to have a significant impact on their nonverbal clues. Ten categories are used to categorize the verbal behavior of teachers hence to make teaching a systematic procedure, the Flanders system proven to be useful and profitable.

11.8 KEY WORDS

Flanders Interaction, Simulation, Encoding, Decoding, Analysis, Paradigm, Strategy, Interactions, Accomplishments

11.9 SELF ASSESSMENT QUESTIONS

Q1. Write down the full form of FIAS.

Q2. Define Flanders interaction System.

Q3. What is the significance of Flanders system for Teaching and Learning process .

Q4. Define various categories of Flanders system.

Q5. Enlist some advantages and limitations of the above system.

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LESSON : 12

DISTANCE EDUCATION

Structure

12.1 INTRODUCTION

Distance education, sometimes referred to as online learning or remote learning, is a revolutionary approach to education in which teachers and students are geographically separated but the learning process is still carried out using digital platforms, technology, and a variety of communication channels. This type of education increases accessibility and flexibility by enabling students to take advantage of professional development opportunities, academic courses, and skill-building chances from almost anywhere in the world.

The idea of distance education originated in the nineteenth century, when institutions provided correspondence courses by mail. However, with the rapid expansion of technology, particularly the internet, distant education

has developed significantly.

There are various ways that distance education can be implemented, but online learning is the most popular. Students under this system get lectures, study guides, and assignments via digital channels. These platforms, which are sometimes called Learning Management Systems (LMS), also let students interact with their teachers and take part in class discussions. Discussion boards, taped lectures, and video conferencing all offer an engaging experience that keeps students interested.

Additionally, by allowing students to monitor their progress, these platforms help to organise and manage the learning process.

Correspondence courses, a more conventional format in which students receive study materials via mail, are also included in the notion of remote education. After finishing their assignments, they mail them back for evaluation. Correspondence courses are still utilized in places with poor internet connectivity, despite being a less common approach these days due to the development of digital technologies. Students in these programs must manage their time and maintain motivation because they are more independent and self-paced. For students who prefer an organized, non-digital learning environment, this format might be quite helpful.

Student support services are one of the most important components of contemporary remote learning. These services are intended to assist students in successfully navigating their academic careers. While tutoring services provide extra academic support for difficult subjects, academic advisers help students select courses and comprehend program requirements. Additionally, a lot of schools give students access to online libraries and resources so they can study more and broaden their knowledge. Given that students may experience feelings of loneliness or stress when studying remotely, some even provide psychological counselling. These support services, which provide them with direction and help to overcome obstacles, are essential to distance learners' success.

Distance education has various benefits, including flexibility in learning schedules, the opportunity to study from home or anywhere, and access to a diverse choice of courses and resources that may not be accessible locally. It is especially advantageous for people who have employment, family, or other personal obligations that keep them from attending traditional classroom-based education. Furthermore, online education removes geographical constraints, allowing students from around the world to interact and learn together.

However, issues such as a lack of face-to-face connection, the requirement for self-discipline, and restricted access to technology in some locations may undermine the efficacy of distant education. Despite these challenges, the growing popularity of online education, aided by worldwide events like the COVID-19 epidemic, has strengthened distant education as an essential component of modern learning. It continues to shape the future of education by providing more chances for lifelong learning.

Students enrolled in distance education must maintain organisation and time management skills in order to stay on top of their coursework because they do not routinely attend in-person classes. Although teachers frequently offer study aids, schedules, and checklists to assist students in staying on course, each student's drive and capacity for individual work are crucial for success in remote learning.

12.2 LEARNING OBJECTIVES AND LEARNING OUTCOMES

After reading this lesson, you shall be able :

- To gain an understanding of the definition, goal, and essential elements of distance learning.

- To make a distinction between the several modern distance learning platforms, such as online learning, correspondence courses, and open student support services.

- To list the benefits and drawbacks of various distant learning platforms.

- To explain the various forms of help that are offered (academic, technological, and psychological) and acknowledge the significance of student support services in distance learning.

12.3 DIFFERENT CONTEMPORARY SYSTEMS:

A variety of systems are used in distance education to accommodate learners' varying needs and preferences. Correspondence, distance, and open student support services are the three primary categories.

12.3.1 Correspondence:

The first type of distant learning was the correspondence system. Under this arrangement, students receive their course materials, homework, and tests via mail. After finishing their tasks, students return them back to the school so they can be graded. The correspondence system is still utilized in places with poor internet connectivity or for students who would rather study in a more leisurely, self-directed manner, even if its use has decreased in recent years due to the development of digital technology. For people who can study on their own and don't need to engage with peers or teachers frequently, this approach works well.

Benefits and Drawbacks:

Benefits :

- Students are able to arrange their study time around other obligations and learn at their own speed.

- People in places without digital infrastructure can use it because it doesn't require the internet or any other technology.

Drawbacks:

- The learning process may be slowed down by feedback that is sent back and forth via mail.

- Students who don't communicate with their teachers or peers often feel alone and unsupported.

Present Use

- Even while digital learning has made correspondence education less common, it still has a place.

- For students who might not have other options, correspondence education offers educational materials in isolated and impoverished places without dependable internet access.

12.3.2 Distance:

Programs where students learn mostly online are referred to as "distance" in the current **context. The supply of information, engagement, and evaluations in this system are all done online. Students use online portals to attend lectures, finish homework, and communicate with peers and teachers via video conferences, email, and forums. Specialized learning management systems (LMS), which give a structured method of accessing resources and monitoring progress, are available at many distant learning schools. Compared to traditional correspondence, distance learning is more participatory and enables real-time communication between students and teachers.**

Features:

Learning Management Systems (LMS), such as Moodle, Blackboard, and Google Classroom, serve as centralized platforms for hosting course materials, videos, assignments, and quizzes, and are essential to online distance learning. Through forums, chat, and live video conferences, these platforms also help students and teachers communicate.

Distance Education Types:

Synchronous learning - refers to in-person classes where teachers and students use video conferencing platforms like Microsoft Teams or Zoom to meet at predetermined times. Interactive conversations and real-time Q&A sessions are made possible by this arrangement.

- **Asynchronous learning -** gives students more freedom by enabling them to access lectures and course materials that have already been recorded at any time. Students can finish homework and take part in online conversations whenever it's convenient for them, which is perfect for people in different time zones or with hectic schedules.

Advantages:

- Students are able to balance their education with other obligations by choosing when and where to study.

- Variety of educational resources are available through digital platforms, including multimedia content, online libraries, and lectures that have been recorded.

- Students can participate, communicate, and work together using chat rooms, discussion boards, and video conferences.

Challenges:

- Students require dependable digital gadgets and internet, which not everyone can access.

- Online education necessitates a great degree of self-control and time management.

- Online learning may not have the same interpersonal relationships as in- person settings, even with interactive resources.

12.4 CHECK YOUR PROGRESS NO.1

- Students can study on   their own without physically being in a regular classroom thanks to the idea of..................education.

  (Answer: Distance)

- The majority of..................education consists of students getting course materials and turning in Home work via online resources via the mail.

  (Answer: Correspondence)

- Students are given tools and flexible timetables to learn at their own speed in…………. educational systems.

  (Answer: Open)

- Offering……………to assist students in managing their studies on their own is one of the essential elements of remote learning.

  (Answer: Student support services)

- …………….techniques in distance learning are intended to mentor students and provide them with remote assistance.

  (Answer: Counseling)

12.5 OPEN STUDENT SUPPORT SERVICES:

The materials and help offered to distant learners are referred to as open student support services. Academic advising, tutoring, library access, technological support, and mental health services are some of the services that assist students in managing their academics. Since distance learning can be alienating, many universities have developed particular support networks for students who learn online. By offering tools that enhance students' educational experiences and success rates, open student support services seek to close this disparity. These services are essential because they give students the assistance they need to overcome obstacles

and foster a sense of belonging to the school.

Types of open student support services:

- Academic Support: To assist students in efficiently managing their coursework, academic support services include writing centers, tutoring, advising, and study materials. Academic advisors offer students advice on study techniques, project management, and course selection.

- Counseling and Mental Health Support: To assist students with issues like stress, time management, and juggling work-study obligations, certain colleges provide counseling services. Support from a counselor fosters mental health, which is important in distance learning because students may feel alone.

- Technical Support: For people who are not tech-savvy, online learning environments can occasionally be complicated. Teams of technical support professionals help students use the platform, solve problems, and guarantee seamless access to digital resources.

12.6 COUNSELING METHODS IN DISTANCE EDUCATION:

In remote learning, counselling is crucial for helping students navigate their academic path. Career counseling, academic advising, and psychological assistance are examples of counseling techniques. Academic advising assists students in managing their academic progress, selecting appropriate courses, and comprehending the requirements of their programs. To help students find employment options connected to their studies, develop pertinent skills, and get ready for the workforce, career counseling is offered.

Another essential element is psychological support, since distant learners may experience feelings of loneliness. Through online messaging, video sessions, and phone calls, counselors provide guidance for problems including time management, motivation, and stress. Distance learners are better prepared to overcome obstacles, maintain motivation, and accomplish their academic objectives with the correct counseling.

12.7 CHECK YOUR PROGRESS NO.2

1. For distant learners, open student support services offer _____ and help.

   (Reply: materials)

2. Study materials, tutoring, advising, and _____ centers are examples of academic support services.
   (Answer: Writing.)

3. Academic advisors assist students with course selection, _____ management, and program requirements.

   (Answer: project)

4. _____ counseling helps students prepare for employment opportunities related to their studies.

   (Answer: Career)

5. Psychological support services address feelings of _____ that distance learners may experience. (Answer: loneliness)

6. Open student support services aim to enhance students' educational _____ and success rates. (Answer: experiences)

12.8 LET US SUM UP:

Students from all walks of life can now acquire information and skills outside of traditional classroom settings thanks to distance education, which has completely changed how individuals access and pursue education. Distance education gives students the freedom and accessibility to learn at their own pace, which is especially advantageous for people with hectic schedules, physical impairments, or geographic restrictions.

As distance education has developed, a variety of approaches have been used, each specifically designed to address the needs of the learner. The ground work for remote learning was established by the conventional correspondence system, especially for students who would rather study independently without the need for technology. Even though they are less popular now, correspondence courses are still a good choice for students who live in places with poor internet connection. They help pupils develop self-discipline and a sense of responsibility by allowing them to study at their own speed.

Due to technological improvements, online distance learning has largely grabbed the lead in recent years. Online distance learning provides an engaging experience that keeps students engaged and motivated through interactive platforms, online forums, and video classes. Because these courses are digital, students may interact with their teachers and fellow students, access their materials from any location, and take part in discussions in real-time. This method addresses the social component of education, which is frequently absent from distant learning, while also improving learning. In order to make the online experience as thorough as in-person sessions, many universities have created specific learning management systems (LMS) that let students monitor their progress, access extra materials, and maintain organisation.

Open student support services, which offer tools and help to make sure that students feel supported and remain involved, are another crucial component of distance learning. To assist students in managing their studies, resources include academic guidance, tutoring, library access, technical support, and even psychological counselling. The difficulties that can occur with online learning, such as loneliness or the need for direction, are addressed by these support services. Institutions can encourage students to succeed and maintain concentration by providing them with these tools, which will help them feel like they belong to a wider community. For students with hectic schedules or geographic difficulties, distance education, also known as online learning, allows them to finish their studies at a distance. The goal of this adaptable model is to make education more accessible to a wider range of learners, including. professionals and those living

in rural locations. Online learning, made possible by Learning Management Systems (LMS) that provide lectures, materials, and real-time communication with peers and lecturers, is the main implementation strategy. Students who prefer self-paced learning can still take traditional correspondence courses, which provide study materials by mail. Student support services, such as academic advice, tutoring, and mental health resources to assist students in navigating their studies, are crucial to distant learning.

12.9 KEYWORDS/GLOSSARY

- Distance Education: Learning conducted away from a traditional classroom setting, often online.

- Correspondence Courses: A traditional method of learning through mailed study materials and assignments.

- Learning Management Systems (LMS): Digital platforms like Moodle and Blackboard used for online education.

- Synchronous Learning: Real-time online classes with live teacher-student interaction.

- Asynchronous Learning: Self-paced learning where students access pre-recorded materials and assignments.

- Open Student Support Services: Academic and psychological resources provided to distance learners.

12.10 SELF ASSESSMENT QUESTIONS

Q1. Describe the idea of distance learning and its main objective.

Q2. Enumerate the benefits and difficulties of correspondence courses.

Q3. Explain the differences between synchronous and asynchronous learning in distance education.

Q4. Explain the role of open student support services in improving the distance learning experience.

Q5. What is the significance of counselling techniques in distance education? Provide examples of these techniques.

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LESSON : 13

EVALUATION STRATEGIES IN DISTANCE EDUCATION

Structure

13.1 Introduction

13.2 Learning objectives

13.3 Evaluation strategies in distance education

     13.3.1 Use of ICT in distance education

13.4 Check your progress no.1

13.5 IGNOU as open learning system

13.6 Check your progress no.2

13.7 Let Us Sum Up

13.8 Keywords/Glossary

13.9 Self Assessment questions

13.10 Suggested Readings

13.1 INTRODUCTION

Evaluation strategies in distance education refer to the various techniques and tools used to measure student learning, engagement, and the effectiveness of the course design in an online or remote learning environment. These strategies are crucial for measuring student progress, improving instructional quality, and ensuring that learning outcomes are achieved in a flexible, accessible, and efficient manner.

13.2 LEARNING OBJECTIVES

After reading this lesson, you shall be able :

- To understand the Importance of Evaluation in Distance Education

- To explain the different types of evaluation (formative, summative, diagnostic) and how they apply

to online learning environments.

- To recognize the function of ICT in education

- To examine the main ICT challenges in education.

- To analyze IGNOU's contribution to Indian education

- To talk about the difficulties IGNOU is facing

- To analyze key challenges of ICT in education

13.3 EVALUATION STRATEGIES IN DISTANCE EDUCATION

1. Formative Assessment : Formative assessments are continual evaluations that allow teachers to track students' learning progress throughout the course. They provide comments to both students and instructors to help them grow. - Quizzes and Polls: Use short, regular quizzes to check comprehension and recall.(- Discussion Boards: Students can participate in online forums where teachers assess their involvement, ideas, and comprehension. - Peer Reviews: Students evaluate each other's work, provide criticism, and promote collaborative learning. - Interactive Activities: Simulations, virtual labs, or interactive problem-solving exercises are used to evaluate skills. - Surveys and self-assessments allow students to evaluate their own progress and reflect on their learning experience.

2. Summative Assessment : Summative assessments measure overall learning outcomes at the conclusion of a unit or course. These evaluations are often used to determine final grades or certifications. -Final exams can be conducted online and examine a wide range of skills and knowledge. -Project-Based Assessment: Assignments such as research papers, presentations, or long-term projects that evaluate applied knowledge and abilities. -Portfolios are collections of students' work over time that demonstrate their learning path and final results. -Case Studies: These enable students to apply their knowledge to real-world problems in a precise and analytical way.

3. Collaborative Assessment : Collaborative evaluations are frequently used in remote learning to mimic real-world working contexts and promote teamwork and information sharing. -Group Projects: Students can work together to develop a deliverable for group projects using online collaborative technologies like shared documents or video chats. -Team Discussions: Assessments are made according to the caliber and profundity of contributions made during debates or group discussions. -Collaborative blogs or wikis are created by groups and evaluated by peers.

4. Authentic Assessment : Authentic evaluations emphasize real-world applications of information and abilities, enabling students to put what they've learned into practical, relevant contexts.

5. Real-World Tasks: These could be simulations or role-playing exercises in which students solve real-

world challenges. Interviews or Case Studies: Students can interview professionals or participate in case studies that need in-depth examination. Practical Demonstrations: Students showcase their abilities through film or other media.

6. Peer and Self-Assessment : Students can evaluate their own or their classmates' work through peer and self-assessment, which promotes introspection and critical thinking. -Rubrics: Students can assess their own and other people's work using clear, well-organized rubrics that are based on preset standards. -Self-Reflection: Students could be invited to consider what they have learned so far and pinpoint their areas of strength and growth.

7. Feedback and Introspection In distance learning, giving students quick, helpful feedback is essential to enabling them know where they stand and where they can grow. **-Instructor Feedback:** Students benefit from thorough, tailored feedback on their assignments and tests.

Automatic Feedback: Certain tests, such as quizzes or assignments, have the ability to give pupils instantaneous, automated feedback, which enables them to promptly clear up any ambiguities.

8. Evaluation Based on Competencies: This approach does not just measure the amount of time spent in the course; it also assesses whether students have learned particular abilities or skills. Assessments that make sure students can show mastery of particular abilities or information are called competency tests. Mastery Learning: Using several tests to determine competency, this approach enables students to advance after proving they have mastered a subject or ability.

9. Adaptive Testing: Adaptive testing offers a more individualised assessment experience by using technology to modify the questions' level of difficulty based on a student's prior responses.

Dynamic Questioning: This method provides a more accurate assessment of a student's knowledge and abilities by adjusting the exam to their level of proficiency.

Computerised Adaptive Testing (CAT): A sophisticated adaptive testing technique frequently utilised for certifications or high-stakes tests.

10. Portfolio-Based Evaluation: A student's learning path and development throughout time are displayed in their portfolio. Assignments, projects, reflections, and other learning artifacts are all included. E-portfolios are digital portfolios that let students arrange and make their work easily accessible. Reflective portfolios allow students to evaluate their own learning and show how they have achieved learning goals.

13.3.1 Use of ICT in Distance Education:

ICT, or information and communication technology, has become a disruptive force in every industry, including education, where it is now essential to administration, instruction, and learning. A vast array of digital

tools, platforms, and applications that make information processing and communication easier are included in ICT. Hardware such as PCs and mobile devices, online resources, multimedia content, learning management systems (LMS), and communication technologies like email and video conferencing are all part of the educational landscape. By combining various ICT elements, the conventional boundaries of time and place are broken and an enhanced and varied learning experience is produced.

ICT integration in distance education has been particularly beneficial, as it has progressed from early models that relied on printed materials and postal correspondence to more contemporary formats that enable on-demand learning, multimedia content distribution, and real-time interaction. In the past, accessibility, engagement, and feedback were issues with distant learning. Although somewhat successful, the method of teaching through print media and correspondence was not as immediate or interactive as traditional class room settings. With this methodology, it was difficult for teachers to provide students with immediate feedback or for students to engage in lively conversations with teachers and peers. ICT has revolutionised distance learning by giving students access to interactive materials and facilitating face-to-face interaction with teachers and classmates. Students can ask questions, get help, and work together on projects using ICT technologies that facilitate both synchronous and asynchronous communication, frequently just as easily as in an in- person classroom.

• **ICT Tools**

Tools for information and communication technology (ICT) have become essential to remote learning, supporting all facets of the administrative, instructional, and learning processes. These resources, which support learning outside of the conventional classroom, include hardware, software, and online learning environments. Students may learn from anywhere, at any time, and frequently at their own pace due to ICT tools, which are essential for making education accessible, engaging, and scalable. They also make it possible for teachers to interact with students, deliver curriculum, and evaluate learning results from a distance. ICT tools are getting more specialized as the need for distance learning keeps rising, providing features catered to various learning requirements.

ICT technologies' adaptability facilitates a range of pedagogical techniques and enables personalized learning experiences. These resources, which are all part of an all-encompassing digital learning ecosystem, include communication apps, content delivery platforms, learning management systems, assessment tools, and collaborative workspaces. ICT tools are crucial for eliminating conventional barriers to education, granting students from various socio-economic and geographic backgrounds access, and improving the caliber of education through creative, interactive content.

Important Types of ICT Tools

- • Tools for Communication: In order to keep students and teachers connected during remote learning, communication technologies are crucial. Email is still a vital tool since it enables official communications

and crucial updates. Real-time, in-person engagement is made possible by video conferencing services such as Zoom, Microsoft Teams, and Google Meet. These platforms replicate the classroom setting and allow for lectures, conversations, and even group projects.

- Learning Management Systems (LMS): The majority of online education programs are built on top of learning management systems (LMS), which include Moodle, Blackboard, and Google Classroom.

- Tools for Content Creation and Delivery: Teachers can create and present multimedia content that improves student engagement with the help of content development tools. Teachers can build visually appealing presentations and e-learning materials with software like Adobe Captivate, Canva, and PowerPoint.

- Tools for Assessment: In distance learning, effective evaluation is essential, and ICT tools have enabled the development, administration, and evaluation of exams from a distance. Instructors can build interactive quizzes that evaluate students' knowledge in real time using online quiz platforms

- Tools for Collaboration: In distant learning, collaboration technologies are crucial for encouraging group projects and teamwork. Students may create, share, and collaborate on documents in real time with tools like Dropbox, Microsoft One Drive, and Google Drive.

Benefits of ICT Tools in Distance Education:

ICT tools have revolutionized distant learning and provided instructors and students with a host of advantages:

- Accessibility: Regardless of a student's location, ICT tools give them access to education. By providing students in rural communities with the same caliber of resources as their urban counterparts, educational equity inequalities can be closed.

- Flexibility: Students can learn at their own speed with distance learning made possible by ICT resources. They can work around their own schedules, access materials at any time, and re watch lectures.

- Personalized Learning: Adaptive learning technologies, which enable courses to adapt to students' progress, are frequently supported by ICT tools. By accommodating different learning styles and speeds, this customization keeps students motivated and involved.

- Interactive Learning: By offering visual, aural, and kinesthetic involvement, multimedia content, interactive tests, and simulations improve learning. This interactive method enhances memory recall and simplifies difficult concepts.

- Effective Collaboration and Communication: Real-time communication made possible by ICT tools encourages collaborative learning and aids students in developing their teamwork abilities. Discussion boards and group chats are examples of tools that facilitate peer learning and group problem-solving.

• **Key Challenges:**

Digital Divide: Explain the problems with unequal access to gadgets and the internet, particularly in low-income or rural areas, using the term "digital divide."

Tech Literacy: Some teachers and students are not tech-literate enough to use digital resources efficiently.

Quality of Engagement: The absence of in-person communication might reduce motivation and engagement.

Security and Privacy Concerns: Data breaches, privacy concerns, and cyber security threats related to online learning platforms are among the security and privacy challenges.

Infrastructure and Maintenance Costs: For institutions, setting up and maintaining a strong ICT infrastructure comes at a high cost.

Conclusion:

Distance education is now much more accessible, interesting, and successful for students all over the world thanks to the integration of information and communication technology (ICT). Students may access top-notch resources and take part in interactive learning experiences thanks to ICT tools, which provide a dynamic learning environment that cuts across regional boundaries. Nonetheless, there are also issues that can impede fair access to education, such as the digital gap and disparities in technological literacy. Institutions must also take into account the expenses of updating and maintaining ICT infrastructure in order to offer a smooth educational experience.

These issues must be addressed as technology develops further in order to maintain the inclusivity and equity of distance learning. The quality and reach of online education could be significantly improved by innovations like virtual reality, artificial intelligence, and adaptive learning technology. By concentrating on these developments, educational establishments can design individualized learning programs that address the various requirements of students, eventually promoting a more successful and inclusive learning environment for all students.

13.4 CHECK YOUR PROGRESS NO1:

• The two main types of evaluation used in distance education are _____ (formative/summative), which is used to monitor ongoing student progress, and _____ (summative/formative), which assesses the final outcomes of student learning at the end of the course.

• ICT helps instructors deliver course content in various formats, such as _____ (videos/articles), _____ (interactive games/assignments), and _____ (PDFs/pictures), catering to different learning preferences.

13.5 GNOU-AN OPEN LEARNING SYSTEM:

The Indira Gandhi National Open University (IGNOU) was founded in 1985 with the intention of giving a variety of Indian communities access to reasonably priced education. By advocating for the open learning philosophy, IGNOU, a trailblazing institution in distant education, has significantly changed the educational environment. People can follow academic programs at their own pace and convenience because of open learning, which places an emphasis on learner-centered education. For anyone who might encounter obstacles to traditional education, such as regional limitations, employment obligations, or family duties, this system is quite helpful. IGNOU has established itself as a leader in the field of distant education due to its wide network of study centers, creative curriculum, and innovative use of technology.

Features:

Several characteristics set IGNOU apart from conventional educational establishments.

- Flexibility: IGNOU's flexibility is one of its main benefits. For people who are balancing employment and school, the ability to select their own study schedules and finish courses at their own speed is crucial.

- Diverse Programs: IGNOU offers a broad range of academic programs in the arts, sciences, commerce, management, and social sciences, ranging from certificate courses to PhD degrees.

- Study Guide: The institution creates thorough study guides that are meant to be self-explanatory. Printed books, audiovisual aids, and internet resources that accommodate various learning styles are examples of these materials.

- Support Services: Academic counseling, workshops, and webinars are just a few of the student support services that IGNOU provides. These services improve the educational process and support students in successfully navigating their academic path

- Open Admissions: Students can enroll in programs at IGNOU without having to meet strict qualifying requirements due to its open admissions policy. A varied student body, including working professionals, stay-at-home moms, and students from rural areas, has been drawn in by this inclusiveness.

Academic Programs & Curriculum:

The curriculum at IGNOU is made to accommodate adverse range of students and is revised frequently to reflect the information and abilities needed in a variety of fields today.

- Variety of Programs: A wide range of programs are available at IGNOU, including under graduate, graduate, diploma, and certificate programs. Because of this diversity, students can pursue courses that complement their interests and career goals.

- Modular Structure: Many programs are structured in a modular format, allowing students to complete courses in segments. This modular approach helps learners manage their time better and reduces the burden of studying extensive syllabi at once.

- Interdisciplinary Learning: The curriculum promotes interdisciplinary learning, enabling students to integrate knowledge from various fields. This approach is crucial in today's job market, where employers seek candidates with diverse skill sets.

- Practical Exposure: IGNOU incorporates practical components in many programs, such as fieldwork, projects, and internships, which provide real-world exposure and enhance employability.

Use of ICT and Distance Learning Resources:

At IGNOU, the use of information and communication technology (ICT) in the class room has completely changed the educational process.

- Online Learning Platforms: IGNOU has created a number of online learning platforms where students can access course materials, turn in assignments, and communicate with peers and instructors. Examples of these platforms include the IGNOU website and Student Support Services.

- E-learning tools: To promote interactive learning and a feeling of community among students, the institution offers e-learning tools such as webinars, online discussion boards, and video lectures.

- Mobile Apps: To increase accessibility to education, IGNOU has released mobile applications. On their cell phones, students can access course materials, view exam results, and get alerts about scholarly events.

- Digital Libraries: Students from all over the world can access a multitude of academic resources, such as e-books, research papers, and journals, through the university's digital libraries.

Evaluation System in IGNOU:

IGNOU's evaluation approach is developed to take into account the particular difficulties of distance learning while providing a thorough assessment of students' comprehension.

- Continuous Assessment: Assignments, projects, and term-end exams are all part of IGNOU's continuous assessment methodology .With this method, students can show what they have learned throughout the course of the semester.

- Assignments: An essential component of the assessment procedure is the assignment. They motivate students to actively interact with the course materials and use what they have learned in real-world scenarios.

- Term-End tests: Designed to evaluate students' general comprehension of the course material, term-end tests are given twice a year. Exam centers can be selected by students according to their convenience.

- Grading Scheme: IGNOU uses a flexible grading scheme that makes it easier for students to assess their performance. Students can more easily comprehend their academic standing due to the grading system's letter grades and grade points.

IGNOU's Contribution to Indian Education:

IGNOU has had a major impact on Indian education, especially in the areas of lifelong learning and inclusion.

- Access to Education: IGNOU has democratized education in India by providing distant learning programs to millions of students who might not have otherwise had access to traditional educational institutions.

- Empowering Women and Marginalized Communities: By giving people the chance to seek higher education and raise their socio economic standing, IGNOU's open learning system has empowered women, rural communities, and marginalized communities.

- Encouraging Lifelong Learning: IGNOU encourages people to pursue education regardless of age or background by providing adaptable courses that are appropriate for students at all stages of life.

- Research and Innovation: The university plays a crucial role in the growth of the country by conducting research projects that address current societal concerns and enhance knowledge.

Challenges Faced by IGNOU:

- Problems with Perception: People frequently believe that traditional schooling is superior to distance learning. Potential students may be deterred from enrolling in IGNOU programs by this notion.

- Barriers posed by technology: Even though technology has improved educational prospects, not all students, especially those in rural regions, have access to dependable internet connections or electronic gadgets.

- Assurance of Quality: It can be difficult to guarantee educational quality across various programs and geographical areas. The university's reputation depends on upholding strong academic standards and faculty proficiency.

- Dropout Rates: IGNOU has greater dropout rates than traditional colleges, frequently as a result of the absence of encouragement, support, and direction for distant learners.

In conclusion, IGNOU deserves praise for its outstanding contributions to societal progress, education, and empowerment. The institution is committed to its goal of giving everyone access to high-quality education in order to create a better future for education in India, even as it faces the challenges that lie ahead. Situations should never stop people from learning, and IGNOU is proof of the ability of easily available education to change people's lives and communities.

13.6 CHECK YOUR PROGRESS NO 2.

- The delivery and accessibility of educational information has been completely transformed by the Use of (ICT) in distance learning.

- The origins of distance education can be traced back to the 19ʰ century and………….. (correspondence courses).

- ………….. (webinars), ………….. (learning management systems), and …………(social media platforms) are important ICT tools utilized in distance learning.

- The combination of …………(virtual reality) and …………. (artificial intelligence) to improve learning experiences is one of the upcoming trends in remote education.

- In order to deliver high-quality education via an open and distance learning system, IGNOU was founded in   (1985).

- One of IGNOU's main ad vantages is its (flexibility),which lets students study at their Own speed.

- More than………….. (200) academic programs, from certificate courses to PhD degrees, are available at IGNOU.

- IGNOU's evaluation method consists of……………(term-end exams),………….(projects), and ....(Assignments).

- Not with standing its successes, IGNOU still has to contend with issues like (dropout rates) and the idea that distant learning is (less good) than regular schooling.

13.7 LET US SUM UP

Distance education has undergone a fundamental transformation due to the integration of information and communication technology (ICT), which makes learning experiences more accessible, interesting, and productive. ICT includes a range of digital tools that improve communication and information processing, such as internet platforms and hardware like computers and mobile devices. Printed materials and mail were the mainstays of remote education in the past, but modern ICT developments allow for on-demand learning and real-time interactions, breaking down previous obstacles. ICT tools promote individualised learning experiences and improve student collaboration in spite of obstacles like the digital divide and disparities in technology literacy. The 1985-founded Indira Gandhi National Open University (IGNOU), which places a high value on adaptability and inclusivity in education, is a prime example of the open learning system. IGNOU empowers students, including those from underprivileged areas, by providing access to high-quality education regardless of their background through a variety of academic programs. Its curriculum uses ICT for effective course delivery and evaluation, with a focus on interdisciplinary learning and hands-on experience. But IGNOU has to deal with issues including how people view remote learning, maintaining

program quality, and controlling dropout rates. IGNOU continues to promote social empowerment and lifelong learning in spite of these obstacles, proving the transformational potential of easily available education in India.

13.8 KEYWORDS/GLOSSARY

Formative assessment, summative assessment, peer review, self-assessment, quizzes, assignments, feedback.

Multimedia content, interactive content, e-learning, presentations, simulations Interactive quizzes, assessments, real-time feedback, formative testing, Collaboration, group work, file sharing, teamwork, Accessibility, flexibility, personalized learning, interactive learning, adaptive learning, Digital gap, access inequality, technological literacy, infrastructure costs.

13.9 SELF ASSESSMENT QUESTIONS

Q1. How may formative and summative assessment techniques be used in distant learning, and what are their differences?

Q2. How can self-evaluation and peer evaluation be successfully incorporated into distant learning?

Q3. How can student progress be monitored and assessed using learning management systems (LMS)?

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LESSON : 14

EMERGING TRENDS IN EDUCATIONAL TECHNOLOGY

Structure

14.1 INTRODUCTION

Emerging educational technology trends are redefining our approach to learning by providing novel tools and platforms that improve the learning experience. Technology is changing traditional approaches, resulting in more dynamic, interactive, and accessible learning settings.

The employment of diverse media has played an important part in this shift, with the incorporation of audio visual aids including video tapes, radio television, and teleconferencing improving content delivery and making education more engaging.

Furthermore, developments such as Closed Circuit Television (CCTV) have improved surveillance and security in educational facilities. The advent of Satellite based education through EDUSAT has increased learning accessibility, particularly indistant locations, through broadcast classes and communication channels.

Elearning platforms have evolved as an effective tool for providing flexible learning possibilities online, while Virtual Classrooms have enabled interactive, realtime teaching regardless of location. These advances emphasise the ongoing growth of educational technology, which creates new options for both students and instructors. The trends address not just the difficulties of accessibility and engagement, but also the rising need for individualised and interactive learning environments.

14.2 LEARNING OBJECTIVES

After reading this lesson, you shall be able :

- To explain the function and applications of various technologies in teaching and learning scenarios.

- To examine how educational TV and radio shows encourage lifelong learning by delivering curriculum-based information.

- To describe how tele-conferencing facilitates distant communication and cooperation between students and instructors.

- To evaluate CCTV's impact on campus safety and the learning environment.

- To explore how EDUSAT might improve access to excellent education in developing nations and rural places.

- To explore how e-learning platforms are changing higher education and business training by offering flexible and accessible learning options.

- To describe virtual classrooms and how they facilitate real-time interactions between students and teachers.

14.3 EMERGING TRENDS IN EDUCATIONAL TECHNOLOGY

14.3.1 Videotape:

Videotape stands out as a transformative medium among the many technologies that have greatly influenced the growth of instructional media. It has changed how teachers present knowledge and how students interact with course materials. The historical background, educational uses, benefits, drawbacks, and potential future of videotape in the classroom will all be covered in this section.

Historical Context:

The 1950s saw the introduction of videotape technology into the classroom. Around this time, educational

establishments started looking into how audio-++'visual tools might improve their teaching strategies. Film was the most common medium used in classrooms prior to videotape. But film's drawbacks, such as the requirement for projection equipment and the difficulty of content editing, led educators to look for more adaptable options.

With the advent of videotape technology, educational media underwent a fundamental change.At first, only larger universities with huge budgets could afford the prohibitively expensive VHS equipment. However, videotape became more widely available to educators and schools as manufacturing prices dropped and technology advanced.Videotape recorders were widely utilized in classrooms by the late 1960s and early 1970s, enabling instructors to record lectures and demonstrations for later viewing.

The distribution of information was completely transformed by the capacity to capture, store, and replicate audiovisual content. Teachers were able to produce captivating, multimedia presentations with videotape, which could improve conventional teaching techniques. Videotape's adaptability, which allowed for many viewings and editing, revolutionized education and paved the way for the current usage of digital media in the classroom.

Pedagogical Applications:

Videotape has been used in many educational settings, demonstrating its adaptability and potency in improving educational experiences:

- Instructional films: Making instructional films is one of the most important uses of videotape in education. Teachers can record their lessons, tutorials, and demonstrations so that students can review difficult subjects at their own leisure. This feature is especially helpful for areas like science and math that call for in-depth knowledge and regular revision.

- Training and Professional Development: Videotapes are used by organizations, such as colleges and universities, to train their employees. This entails presenting professional development opportunities, successful teaching techniques, and best practices. Observing seasoned educators in action might help new instructors learn from practical examples rather than just theoretical frameworks.

- Evaluation and Feedback: Videotape is also essential for evaluating student performance, particularly in hands-on topics like theatre, sports, and music. By recording their performances, teachers may give students thorough feedback that helps them pinpoint their areas of strength and growth. Because it offers a visual record of students' progress, this evaluation approach is more thorough and objective than traditional tests.

- Additional Learning Resources: To support class room instruction, extra learning materials can be produced using videotape technology. For example, teachers can videotape field trips or guest lectures to provide students with more view points and insights into the subject.

Advantages of Video tape in Education:

- Flexibility: The flexibility that videotape offers is one of its main advantages. Personalized learning experiences are made possible by the availability of recorded lectures and instructional videos for students to see whenever it is most convenient. With the ability to pause, rewind, and rewatch content as needed, this flexibility accommodates a variety of learning methods and speeds.

- Visual Engagement: Students' comprehension and memory of material are improved when audio and visuals are combined in filmed content. Multiple-format presentations help pupils recall information better, according to an educational study. By offering a rich multimedia experience that engages students more successfully than standard text-based resources, videotape leverages this idea.

- Accessibility: Students in different places can receive videotapes thanks to their widespread distribution. This is especially crucial for remote learning and distance learning situations, where students do not have access to conventional classroom settings. The dissemination of filmed content on the internet broadens the audience for educational materials.

- Content Standardization: Videotape makes it possible to standardize educational resources. Teachers are able to produce excellent, standardized curricula that can be utilized in several classrooms or educational institutions. By guaranteeing that every student receives the same information, this standardization advances educational equity.

- Improved Collaboration: Teachers can work together more easily because to videotape technology. By sharing their recorded lessons with peers, educators can gain insight from one another's methodologies and enhance their teaching strategies as a group.

Challenges:

Not with standing its benefits, there are drawbacks to using video tape technology in the classroom:

- Transition to Digital Media: Traditional videotape is becoming less common as a result of the substantial shift toward digital media brought about by the quick development of technology. A lot of educational institutions have switched to digital formats like multimedia presentations, online courses, and streaming videos. Because of this change, instructors must modify their material for the new platforms, which can call for more resources and training.

- Content Quality: Although videotape makes recording simple, the resulting material can differ greatly in quality. Videos that are poorly made and have poor lighting, sound, or editing might make learning less enjoyable.To get the most out of this medium, educators need to put in the time and effort to produce high- quality videos.

- Technological Difficulties: Using video tape technology in the classroom necessitates having access to tools and technological know-how. Some teachers might not be at ease with technology, which

could result in differences in the calibre of instructional videos created. Additionally, technical problems like malfunctioning equipment or incompatible formats might make it difficult to successfully use videotape in classrooms.

- Cost considerations: Although the price of videotape equipment has come down over time, creating high- quality video content still has financial implications. It might be difficult for schools to budget for equipment, editing software, and training, particularly for institutions with limited funding.

14.3.2 Radio:

Historical Context:

When the technology was first made accessible to the general public in the 1920s, radio's incorporation into education got underway. At first, radio was thought of mostly as a form of entertainment, but teachers soon realized that it could also reach listeners in far-flung places where traditional education was frequently unavailable. Radio became an essential tool for spreading knowledge and information to a wider audience by airing educational programs.

In the 1950s, television made its debut in education and quickly became well-liked. Like radio, it gave teachers a special opportunity to interact with students outside of the traditional classroom.A more dynamic learning environment was produced by programs created especially for educational reasons, which enabled teachers to engage with pupils through visual storytelling. Both television and radio established themselves as mainstays in homes and classrooms, greatly influencing the distribution and consumption of instructional materials.

Pedagogical Applications:

A wide range of programs has been created by educational radio with the goal of improving learning. These programs frequently consist of:

- Lectures and Lessons: Radio stations provide lectures on a range of topics, from science to language arts. As an alternative to traditional classroom education, educators produce structured content that listeners can follow along with.

- Discussions and Interviews: Educational radio regularly includes discussions and interviews with specialists in a range of subjects, giving listeners a chance to interact with current events and learn first hand from professionals. This method encourages audiences to think critically and talk with one another.

- Targeted Programs: A lot of radio shows cater to certain audiences, such young people or adults picking up a new language. Accessibility for listeners with visual impairments has also been the focus of new programs like "Radio for the Blind."

Television:

Many classic instructional programs that have had a long-lasting influence on education have been created by television:

- Entertaining Education: By incorporating storytelling, puppetry, and song into instructional content, shows like "Sesame Street" have made learning fun for kids. These programs have proven to be incredibly successful in teaching fundamental abilities like reading and numeracy.

- Programs pertaining to science and nature: Programs such as "Bill Nye the Science Guy" offer amusing yet educational material on scientific subjects. These shows hold viewers' interest and make difficult subjects more approachable and understandable

- Historical programming and documentaries: Educational documentaries help viewers develop a more comprehensive worldview by extending their knowledge of historical events, cultures, and societal challenges.

• Advantages of Radio and Television:

There are various benefits to using television and radio in the classroom.

- Broad Audience: Both media can concurrently transmit educational content to millions of individuals. This broad reach is particularly advantageous for underprivileged or rural communities that lack access to high- quality educational institutions.

- Cost-Effective Education: Creating instructional material for television and radio is typically less expensive than building actual schools. For governments and groups looking to deliver education in environments with limited resources, this makes it a desirable choice.

- Taking Various Learning Styles into Account: Television appeals to visual learners, where as radio serves auditory-learners.These media improve understanding and retention by providing a mix of visual and aural information, catering to different learning styles.

- Flexible Learning: Education is made more flexible by allowing students to view television and radio content whenever it is most convenient for them. For adult learners juggling school with employment or family obligations, this is especially crucial.

Challenges:

Notwithstanding their benefits, radio and television present a number of difficulties in the educational setting:

- Declining Viewership: Traditional radio and television viewership has been declining, partly due to the growth of the internet and digital media. Since many people, particularly younger audiences, prefer internet programming, educational broadcasters have had to modify their approaches.

- Relevance of Content: Educational programming needs to be updated to reflect popular culture and subjects in order to appeal to today's viewers. To be relevant, programming must be updated frequently and innovatively.

- Limitations of Interactivity: Traditional radio and television programming frequently lacks opportunities for viewer participation, in contrast to digital platforms that enable interactive learning experiences. Participation and involvement may be restricted as a result.

- Quality Control: For educational programs to be effective, excellent production quality must be maintained. It is crucial for producers to invest in the right tools and qualified staff since poor audio or picture quality might hinder the learning process.

To sum up, television and radio have been crucial to the advancement of educational technology by offering a variety of audiences interesting and easily available content. The digital landscape presents problems for various media, yet integrating with online platforms and implementing creative content strategies are key to their future. Educational radio and television can continue to be essential parts of the educational process by developing and adapting further, making learning interesting and accessible to everyone.

14.3.2 Tele-Conferencing:

By enabling real-time communication across geographic boundaries, teleconferencing technology has completely changed the way instructors and students interact.

Tele-Conferencing in Educational Technology:

Tele-conferencing has radically changed education by facilitating live interaction, breaking down distance barriers, and fostering smooth communication between teachers and students.This advancement has become particularly vital in a world increasingly reliant on digital solutions for learning.This progress is crucial in a world that relies more and more on digital solutions for education. Tele-conferencing refers to the use of communication technologies to facilitate remote meetings, discussions, and learning sessions. This includes various forms of communication, such as video calls, audio calls, and web conferencing tools like Zoom, Microsoft Teams, and Google Meet and Through these platforms, educators can conduct classes, facilitate group discussions, and engage in collaborative projects with students and colleagues from different locations. This real-time interaction not only replicates the experience of in-person learning but also enhances accessibility for diverse learners. This real-time interaction not just mimics the in-person learning experience but also boosts accessibility for a variety of learners.

Pedagogical Applications:

Tele-conferencing has numerous applications in the educational sector:

- Remote Learning: In recent years, especially during the COVID-19 pandemic, tele-conferencing became essential for distance education. Educators delivered live lectures, engaged students in discussions, and provided feedback, allowing for an interactive learning experience that closely mirrors a traditional classroom setting.

- Collaboration: Tele-conferencing facilitates collaboration among educators globally enabling them to share resources, strategies, and best practices.

- Professional Development: Embracing tele-conferencing empowers educators to engage in workshops, training sessions, and conferences seamlessly, eliminating travel obligations. This not only saves time and money but also makes it easier for teachers to engage in continuous professional development. Virtual conferences have become increasingly popular; they offer diverse topics and speakers while accommodating a broader audience.

Benefits of Tele-Conferencing:

The advantages of tele-conferencing in education are plentiful:

- Real-Time Interaction: Students' capacity to participate in real-time discussions is one of the biggest benefits of teleconferencing. In order to replicate an in-person classroom setting, they can discuss their opinions, take part in surveys, and ask questions. By encouraging a feeling of community among students, this interactivity raises motivation and engagement.

- Cost-Effective: For both teachers and students, teleconferencing drastically cuts down on travel expenses and time. By investing in improved technology or instructional materials instead of paying for travel, educational institutions can more effectively manage their resources. Schools and institutions can reach more students because to this cost-effectiveness, particularly those who live in rural places.

- Flexibility: Because participants can join meetings and seminars from different locations, teleconferencing provides an unmatched level of flexibility. For adult learners juggling work and family obligations, this accessibility is essential since it enables them to pursue education outside of the traditional classroom environment. To further improve their learning experience, recorded sessions also allow students to review material whenever it is most convenient for them.

Challenges:

Although teleconferencing has many benefits, there are a number of drawbacks as well:

- Technical Problems: Hardware failures, software bugs, and poor internet access can all reduce the efficiency of teleconferences. During live sessions, there may be interruptions for both teachers and students, which could affect the educational process. To lessen these difficulties, institutions must make investments in dependable technology and offer assistance.

- Involvement and Pedagogy: Innovative pedagogical techniques are needed to sustain student involvement in a virtual setting. Teachers must modify their pedagogical approaches to promote engagement and communication. To keep students interested, this may entailintroducing breakout spaces for conversations in small groups, utilizing interactive resources like surveys and quizzes, and employing a variety of teaching strategies.

- Digital Divide: Although teleconferencing makes things more accessible, it may also make things worse. Different pupils may not have equal access to dependable technology or the internet, which could lead to differences in their learning chances. For teleconferencing to serve all students equally, these disparities must be addressed.

To sum up, teleconferencing technology has transformed education by facilitating real-time communication, encouraging teamwork, and offering flexibility to both teachers and students. Even though there are drawbacks, they are greatly outweighed by the advantages, which makes teleconferencing a

main stay of contemporary teaching methods. Teleconferencing's ability to improve educational experiences will only increase as technology develops further, guaranteeing that education is always available, interesting, and successful for all students**.**

14.4 CHECK YOUR PROGRESS NO1:

1. What function, in your opinion, will instructional television and radio play in the future of education especially in the digital age?

2. In what ways does teleconference improve instruction? Describe some examples.

14.4.1 CCTV:

With its multidimensional approach to security and learning development, closed-circuit television (CCTV) technology has grown its   importance in educational institutions. CCTV systems, which are most recognised for their use in surveillance, offer a safe and secure environment for employees and pupils, discouraging misbehaviour and guaranteeing timely incident reactions. In addition to providing security, CCTV may help with educational activities by enabling remote classroom monitoring, which enables teachers to evaluate their methods and raise the standard of instruction. It can also be used as a teaching tool to help novice instructors observe more seasoned ones and pick up efficient classroom management techniques. Additionally, CCTV can help children develop a sense of responsibility, which will motivate them to participate constructively in their classroom. The use of this technology at colleges and universities is indicative of a larger movement to improve educational experiences through creative problem-solving. CCTV technology is essential to the design of contemporary learning environments because it strikes a balance between security requirements and instructional goals. All things considered, the use of CCTV in schools shows a dedication to developing secure, interesting, and productive learning environments.

An Overview of Educational CCTV:

CCTV allows for the surveillance and monitoring of different areas within educational institutions by using video cameras to send signals to designated monitors.

Applications for Security:

- Campus Safety: By keeping an eye on busy locations, discouraging criminal activity, and guaranteeing the security of both employees and students, CCTV systems improve campus safety.

- Documentation of Incidents: Video recordings can serve as proof in court cases or incidents, supporting inquiries and encouraging responsibility.

Improvement of the Learning Environment:

CCTV can be used for teaching in the following ways:

- Classroom Observation: Teachers can pinpoint areas for development by watching recordings of their instructional strategies.

- Student Monitoring: By helping to keep an eye on how students behave and interact, CCTV can support the development of a supportive learning environment.

Advantages:

- Increased Safety: CCTV increases school security overall, giving parents, employees, and students piece of mind.

- Data collection: By providing insightful information about student behavior and engagement, recorded video can help shape school policies and procedures.

Difficulties:

Even though CCTV improves security, privacy and surveillance issues could surface. To maintain openness and safeguard individual rights, institutions must provide explicit guidelines for the location of cameras and the use of data.

14.4.2 EDUSAT:

India's first educational satellite, EDUSAT, was launched in September 2004 and represents a significant turning point in the development of distance learning. EDUSAT is largely focused on providing educational information to underserved and distant locations, with the goal of expanding the reach and quality of education throughout the country. It makes it possible to broadcast live courses, workshops, and training sessions, which helps to close the distance between teachers and students in different places. EDUSAT

is essential to democratising education by enabling interactive learning experiences that guarantee all students, regardless of background, have access to high-quality learning materials. In order to promote an inclusive learning environment, it also supports a number of educational projects, such as community learning centres and teacher training. The ability of satellites to broadcast audio-visual content has revolutionised conventional teaching strategies, increasing the effectiveness and engagement of education. With its extensive influence, EDUSAT keeps influencing Indian education's future and encouraging chances for lifelong learning for everyone.

Pedagogical Applications:

- Real-Time Interactive classrooms: Teachers can hold live classrooms and engage with students thanks to EDUSAT's two-way audio and video communication capabilities.

- Educational Broadcasting: It facilitates the transmission of lectures, workshops, and educational activities to students who live in remote locations.

Advantages:

- Accessibility: By bridging the gap between urban and rural educational resources, EDUSAT has made education more affordable for children in underserved and rural areas.

- Quality of Content: The learning experience is improved by the high-quality audio-visual information that is delivered via satellite.

Difficulties:

Need for Trained Staff: The need for qualified staff to use the technology efficiently is one of the major issues EDUSAT is now experiencing. In addition to being educated to utilize satellite technology, educators and support personnel also need to be trained to create and present curriculum-aligned content that satisfies educational standards. The usefulness of EDUSAT may be hindered in some locations by the requirement for specialist training, especially in rural areas where access to training materials may be restricted.

Curriculum Alignment with Content: The effectiveness of EDUSAT depends on making sure that the instructional material it broadcasts is in line with regional and national curriculum. There may be differences between what is needed in local educational environments and what is offered via satellite.

14.4.3 E-Learning:

The delivery and consumption of education have been revolutionized by e-learning, which is the use of electronic technologies to access educational content outside of a traditional classroom context. It includes a range of modalities, such as webinars, online courses, and mobile learning apps. Education is now more accessible than ever because to this flexibility, which allows students to access resources and take part in classes from any location with an internet connection.

Advantages:

Many students find e-learning to be an attractive alternative due to its many benefits.

- Flexibility and Convenience: The flexibility of e-learning is one of its biggest advantages. Students are free to study whenever they want and to interact with the course materials whenever they want. People who are juggling work and personal obligations will especially benefit from this flexibility since it enables them to design a learning schedule that works with their schedules.

- Various Educational Resources: A wide range of resources, such as films, tests, interactive exercises, and discussion boards, are frequently available one-learning platforms. Because of this versatility, students can interact with the material in a way that best meets their preferences and accommodates a variety of learning styles. For example, kinesthetics learners could favor interactive simulations, while visual learners might benefit from video lectures.

- Global Reach: Students can access courses given by universities all around the world thanks to e-learning, which breaks down geographical boundaries. Students can enrol in programs that might not be offered locally because to this worldwide reach, which also gives them the chance to study from well-known instructors and business professionals. It creates a multicultural classroom where kids can engage with classmates from various cultural and ethnic backgrounds.

Challenges:

Even while e-learning has many benefits, there are drawbacks.

- Sustaining Student Motivation: Sustaining students' motivation and engagement is a major difficulty in online learning. Students may feel isolated in the lack of a traditional classroom setting, which makes it simpler for them to stop participating in the learning process.Institutions need to come up with ways to help students interact and build a sense of community, like online study groups, discussion boards, and frequent check-ins.

- Ensuring Content Quality: As e-learning has grown quickly, so too have online programs and courses. But not every option up holds the same high standards of quality. For learning to be effective, it must be current, accurate, and relevant. Establishing strict quality assurance procedures is necessary for institutions to verify and uphold the integrity of their courses.

- Technological Disparities: Because e-learning is so dependent on technology, it may lead to differences in student performance. There are significant differences in access to dependable internet connections and appropriate equipment, particularly in rural or underdeveloped locations. Some students may find it difficult to participate completely in online courses due to this technology divide, which could exacerbate already-existing educational disparities.

In summary, e-learning offers flexibility, a wide range of resources, and worldwide access, marking a substantial change in the educational landscape. With the incorporation of cutting-edge technologies that promise to improve individualised and immersive learning experiences, the future of e-learning is bright, despite obstacles including student motivation, content quality, and technological inequities. E-learning will probably become more and more important in the educational environment as institutions continue to develop and adapt, making sure that learning is always available and pertinent for everyone.

14.4.4 Virtual ClassRoom:

Teachers and students can communicate in real time utilising digital tools and platforms in a virtual classroom, which is an online learning environment. Although it uses the internet, it functions similarly to a traditional classroom and enables participants to be in different physical locations. The same learning objectives of traditional classes are met by virtual classrooms, which also offer the flexibility, accessibility, and interactivity that are essential to contemporary education.

Virtual classrooms have grown in popularity as educational technology advances, particularly with the emergence of online and blended learning methods. By providing instructional content in creative ways, they are crucial to corporate training, distant learning and higher education.

Features:

A dynamic learning environment is supported by a variety of interactive and collaborative features built in to a virtual classroom. Important elements frequently consist of:

- Real-Time Interaction: Teachers can promote engagement and involvement by conducting live lectures, holding discussions, and facilitating Q&A sessions using video conferencing services like Zoom, Microsoft Teams, and Google Meet.

- Digital Whiteboards and Presentation Tools: Teachers can improve explanations and simplify difficult subjects by utilizing digital whiteboards, screen-sharing, and multimedia tools. Both teachers and students can use the sketching and annotation tools available in many virtual classrooms.

- Breakout Rooms: Teachers can divide the main class into smaller groups using breakout rooms, which makes it simpler to lead discussions and group projects. For group projects and conversations, breakout spaces are perfect since they promote cooperation and peer education.

- Interactive Polls and Quizzes: Teachers can assess students' comprehension and maintain their interest by using polls, quizzes, and surveys. They give teachers immediate feedback so they can modify the material and tempo as necessary.

- File and Screen Sharing: Within the virtual classroom, teachers can easily exchange files, including PowerPoint presentations, PDFs, and other digital materials, so that students can easily access and follow along.

- Playback and Recording: A common feature of virtual classrooms is the ability to record sessions

so that students can review them at a later time, which helps to reinforce learning. Students in different time zones or those who require additional time to understand subjects may particularly benefit from this.

- Interactive Chat and Discussion Forums: Students can use chat to express their ideas or ask inquiries without disturbing the teacher.

Advantages:

- Digital Divide: Some students lack the gear required to participate in virtual classrooms and high-speed internet. Access to education is unfairly impacted by the digital divide, especially in low-income or rural areas.

- Absence of Physical Interaction: Compared to traditional venues, virtual classrooms lack the immediacy and physical presence. It is more difficult to discern non verbal clues like body language online, which makes it challenging for teachers to assess students' interest and comprehension.

- Technical Problems: Reliable internet and functional technologies are essential for virtual learning. Technical problems, such slow internet connections or software bugs, can interfere with instruction and irritate teachers and students.

- Screen Fatigue: Long-term screen use can cause screen fatigue, which impairs pupils' ability to concentrate and pay attention.

- Preserving Academic honesty: It can be difficult to keep an eye on tests and uphold academic honesty in a virtual environment. Teachers must implement assessment practices that reduce the possibility of cheating and use safe resources.

- Teacher Training: Teachers must receive instruction on how to use digital teaching methods and virtual classrooms effectively. It can be difficult for teachers to utilize the resources at their disposal without proper training, which could lower the standard of instruction.

Best Practices forVirtual Classroom:

Teachers can implement the following recommended practices to establish a successful virtual learning environment:

- Include Interactive Elements: Surveys, tests, and Q&A sessions guarantee that students comprehend the subject matter and keep them interested. To keep participants' attention, activities should be interspersed throughout the session.

- Promote Collaborative Learning: Peer communication and teamwork should be encouraged in virtual classrooms. Learning becomes more dynamic and social when group tasks are assigned, breakout spaces are used, and interactive conversations are held.

- Give Clear Instructions: It's critical to give clear instructions in a virtual environment. Instructors

must to provide clear guidelines for assignments, expectations for participation, and due dates. Students can also keep organized by using visual aids like checklists or PowerPoint.

• Create a Structured timetable: Students in virtual classes benefit from a regular timetable that aids with routine development. Because students can efficiently schedule their screen time and breaks, structured sessions also help students avoid screen weariness.

Education has been transformed by virtual classrooms, which make it adaptable, accessible, and customized for a wide variety of students. Virtual classrooms have a strong chance of becoming a standard in contemporary education, even in the face of obstacles like the digital divide and technical difficulties.Virtual classrooms are anticipated to provide even more rich learning experiences with the integration of new technologies and technological breakthroughs, opening the door to a more inclusive and interesting educational future.

14.5 CHECK YOUR PROGRESS NO 2:

• In terms of history, the..............(decade) saw the introduction of video tapes into the classroom.

(Answer:1970s)

• One major issue with video tapes is that their quality can deteriorate overtime, becoming………….

(Answer:Grainy and difficult to view)

• Video tapes are seen to be useful in education since they can teach …………….

(Answer : Complex concepts through visual demonstrations)

• Radio and television have two main instructional purposes:……………and……………

(Answer : Broad casting educational content, providing remote learning opportunities)

• The ability of instructional television to reach..............locations, where traditional schools might not be accessible, is one of its advantages.

(Answer:Rural and under served

• The absence of................student response is a problem with radio as a teaching tool.

(Answer:Immediate feedback)

• Students can communicate remotely with…………….professionals and educators using teleconferencing.

(Answer:Subject matter)

• CCTV ensures...........on school grounds,which enhances the learning environment.

(Answer : Safety and Security)

• EDUSAT is a satellite in India that is exclusively used for…………….

(Answer:Educational purposes)

14.6 LET US SUM UP

From radio-television and old-fashioned videotapes to sophisticated virtual classrooms and e-learning platforms, educational technology has changed dramatically.Although their static nature presented limits, videotapes initially offered a way to revisit courses, improving understanding. Following radio and television, these media provided mass education programs but had drawbacks such as a lack of interactivity. While CCTV cameras in schools enhanced security and monitored learning environments, teleconferencing allowed faraway learners to communicate in realtime, bridging geographical divides. Despite technological difficulties, India's education satellite, EDUSAT,increase access to education in rural areas. On-demand, flexible learning was made possible by e-learning, however connectivity problems still exist. Last but not least, virtual classrooms provide an immersive, engaging experience that keeps improving with technology, suggesting a more flexible and inclusive educational future.

14.7 GLOSSARY/KEYWORDS

Videotape Technology: The use of magnetic tape to record and replay audiovisual material, particularly for educational reasons, is known as videotape technology.

VHS was formerly a popular video recording format, however it has been mainly replaced by digital formats.

Digital Formats: Modern ways for storing and transmitting video and music that provide higher resolution and greater flexibility.

Tele conferencing: Tele conferencing is a technology that allows individuals to connect in real time via video, sound, and chat from a distance.

CCTV: Closed-circuit television; utilized in educational settings for security and instructional objectives.(EDUSAT: EDUSAT is India's first educational satellite, designed to enable remote and interactive learning, particularly in disadvantaged locations.

Virtual classrooms : Virtual classrooms are online spaces that simulate a typical classroom setting but use digital tools to allow students and teachers to communicate in real time.

Instructional technology: Technology used to support teaching and learning is known as instructional technology.

14.8 SELF ASSESSMENT QUESTIONS

What contribution has videotape technology made to the creation of instructional media?

What new technological advancements in education could improve the quality of education in the future?

   Q1. What are the advantages and disadvantages of teleconferencing in the classroom?

Q2. In what ways does CCTV support school security and learning?

Q3. What role does EDUSAT play in India's educational system?

Q4. What are the primary drawbacks and advantages of online education in the modern world?

Q5. How are accessibility and flexibility in learning addressed in virtual classrooms?

Q6. What role may educational television and radio play in the digital age?

Q7. How will creativity play a part in teleconferencing and instructional media in the future?

14.9 SUGGESTED READINGS

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LESSON : 15

COMPOSITION & ROLE OF RESOURCE CENTRES FOR EDUCATIONAL TECHNOLOGY

Structure

15.1 Introduction

15.2 Learning objectives and Learning Outcomes

15.3 Composition & Role of Resource Centres For Educational Technology

    15.3.1 CES (UGC) CIET

15.4 Check Your Progress No.1

15.5 Distance

    15.5.1 AVRC

    15.5.2 EMRC

    15.5.3 INTEL

15.6 Check Your Progress No.2

15.7 Let Us Sum Up

15.8 Keywords/Glossary

15.9 Self Assessment questions

15.10 Suggested Readings

15.1 INTRODUCTION

In today's educational environment, educational technology resource centres are essential for connecting conventional teaching methods with the quickly changing digital technology landscape. These centres prioritise developing, selecting, and disseminating instructional materials that serve a range of student demographics, promoting educational accessibility, and helping teachers successfully integrate technology. The demand for educational institutions that can create content to improve the educational process and make it more

interactive and widely available is growing as digital media usage rises. These centres' responsibilities include developing content, integrating technology, educating teachers, and even setting up the necessary infrastructure to facilitate online education. Their main objective is to raise the standard and accessibility of education for students from a range of socioeconomic and geographic origins.

15.2 LEARNING OBJECTIVES

After reading this lesson, you shall be able :

- To define resource centers and explain how they help educational technology projects.

- To determine the roles and objectives of CES (UGC) in expanding the use of technology in education.

- To understated CIET's role in creating and implementing new educational technology.

- To discuss how Distance Education Resource Centres (DERCs) help to provide accessible and flexible learning alternatives.

- To understaffed EMRC's goals and role in the creation of instructional multimedia material.

- To identify the primary services offered by AVRCs to encourage the use of audiovisual materials in education.

- To explain the relationship between these facilities and distant learning platforms, as well as their function in bringing education to rural locations.

15.3 COMPOSITION & ROLE OF RESOURCE CENTRES FOR EDUCATIONAL TECHNOLOGY

15.3.1CES (UGC)CIET:

The University Grants Commission (UGC) created the Consortium for Educational Communication (CES), an inter-university institute dedicated to expanding access to higher education via electronic media. CES is one of the biggest educational broadcasting companies in India, operating through a network of Educational Multimedia Research Centers (EMRCs). CES focuses on offering educational materials that complement university curricula, facilitating remote access to high- quality instruction, and utilising multimedia to improve learning outcomes.

Conversely, the National Council of Educational Research and Training (NCERT) oversees the Central Institute of Educational Technology (CIET). The creation and distribution of multimedia content for classroom instruction is its primary focus. Teachers can get training on how to use digital technology in the classroom via CIET, which is a central resource.

Objectives of CES & CIET:

Improving Educational Accessibility: By employing satellite transmissions to connect with students in isolated or underdeveloped regions, CES (UGC) seeks to increase access to higher education. In turn, CIET works to ensure that children have access to high-quality educational resources by making school-level instruction available through digital content.

Enhancing Educational Quality: To improve the quality of education, CIET is committed to creating pedagogically sound content, such as interactive multimedia, animations, and instructional materials.

Promoting Digital Literacy: By teaching educators and students how to use ICT resources, CIET promotes digital literacy and creates an atmosphere where technology improves the educational process.

Promoting Inclusive Education: Through initiatives like Gyan Darshan and SWAYAM Prabha, CES (UGC) and CIET seek to offer inclusive education, particularly for underserved populations who do not have easy access to educational institutions.

Supporting Lifelong Learning: By creating information that students of all ages may access, CES and CIET promote lifelong learning. The National Education Policy's emphasis on lifelong learning is consistent with this open-access strategy.

Encouraging Research and Innovation: CES and CIET open the door for creative approaches to education by funding research projects in educational technology and digital content production.

Composition & Role:

The UGC started the CES (UGC) project, which is backed by a variety of academic specialists and content producers with a range of educational backgrounds. Organizing university-produced instructional content and developing a systematic broadcasting system that complements curricula are two of the UGC's responsibilities. CES disseminates educational content via a variety of platforms, including Gyan Darshan from IGNOU.

Media Production, Engineering and Technical Services, ICT & Training, and Research & Evaluation are among the departments that make up CIET, which operates under the auspices of NCERT. Teams of educators, content producers, animators, technological specialists, and training specialists carry out CIET's activities. Technical and educational experts are included to guarantee that the information is correct and presented through digital media in an efficient manner.

Every department of CIET has a specific function:

Media Production: This division is in charge of producing instructional radio shows, films, and online materials for educational institutions.

Technical assistance for production and broadcast facilities is provided by engineering and technical services.

ICT & Training: To assist instructors and students in navigating the world of digital education, this department offers ICT training.

Research & Evaluation: The R&D division of CIET is responsible for evaluating the results of its programs, monitoring developments in educational technology, and putting required improvements into place.

Roles & Functions:

Higher education is greatly aided by CES (UGC), which provides initiatives that enhance university curricula. Among its primary duties are:

Broadcasting Educational Programs: CES (UGC) broadcasts programming for undergraduate and graduate courses in a variety of fields that is in keeping with academic standards.

Creation of Educational Resources: CES makes sure that curriculum-based, structured materials are created to meet the learning needs of college students. This covers information about professional courses, the social sciences, the sciences, and literature.

Partnerships with Universities and Subject Matter Experts: To provide top-notch instructional materials, CES partners with academic institutions, subject matter experts, and governmental organisations.

Evaluation & Assessment: Regular evaluations of the broadcast's efficacy and substance aid CES in raising the caliber of its educational offerings.

School education is a clear focus of CIET. Its main purposes are:

Creating and Disseminating Educational Content: CIET produces interactive e-books, digital worksheets, and video lessons, among other multimedia resources, for educators and learners.

ICT Teacher Training: CIET plays a key role in preparing educators to use digital tools in the classroom. The goal of initiatives like ICT in Education and workshops on multimedia use in the classroom is to increase teachers' digital literacy.

Research in Educational Technology: CIET does a great deal of research on successful educational technology practices, such as the integration of ICT, online pedagogy, and multimedia use in the classroom.

Creating Educational Radio and Television Content: CIET targets schoolchildren with its educational radio programs, Gyan Vani, and Kishore Manch on DD.

Student Assessments and Interactive Programs: CIET provides students with interactive programs that allow them to evaluate their comprehension of subjects and get feedback.

Impact & Reach:

The effects of CES(UGC) and CIET on Indian education are extensive:

Reaching Remote Learners: Students in remote locations who are unable to attend regular colleges can access vital higher education resources through CES (UGC). Students from a variety of backgrounds can now receive the same high-quality education that is offered in urban settings thanks to the satellite transmissions.

Supporting Multilingual Content: In a multilingual nation like India, it is essential that students from all linguistic origins have equitable access to education. CES and CIET do this by creating content in numerous Indian languages.

Facilitating Education for All: CIET and CES have fostered inclusion through programs that target underserved areas. For instance, CIET's digital projects promote education for all by addressing social inequalities and gender challenges.

Promoting Digital Transformation: The way education is delivered has been profoundly impacted by CIET's ICT training programs, which have enabled thousands of teachers to incorporate digital tools into their lesson plans. India's goal of developing a digitally knowledgeable populace is in line with this digital transition.

Improved Learning Experiences: Students learn more effectively and engagingly because to CIET's multimedia content, which includes interactive resources, animations, and video courses. This helps students do better academically.

Scalability and Sustainability: Both CES and CIET employ environmentally friendly content distribution strategies, such as digital platforms and satellite, to reach big audiences without incurring the expenses of conventional classroom settings. Its scalability is crucial for a nation with a large student body.

Support for the National Education Policy Objectives: By emphasizing digital education, diversity, and lifelong learning, CES (UGC) and CIET have been instrumental in putting the National Education Policy (NEP) 2020 into practice. NEP's objectives of democratizing education and equipping students for the digital age are in line with these programs.

15.4 CHECK YOUR PROGRESS NO.1

- Describe how CES and CIET help make education more accessible to students from different language backgrounds and remote areas.
- What role does multimedia content play in improving educational opportunities?

15.5 DISTANCE

15.5.1 AVRC

A specialised educational media production organisation in India, the Audio-Visual Research Centre (AVRC) is tasked with creating, producing, and disseminating instructional audio-visual materials. AVRC was founded

under the direction of the University Grants Commission (UGC) to assist educational establishments by producing multimedia educational resources, thus improving the educational experience for students throughout India. AVRC creates digital materials to enhance learning and support academic courses with the primary goal of providing high-quality, easily accessible education.

AVRC is a component of a broader set of educational technology programs in India, which also includes CES (UGC), EMRC, and CIET. AVRC focuses on creating audio and video content that may be shown on educational radio and television stations like Gyan Vani and Gyan Darshan, as well as online. With the development of digital education, AVRC's function has grown in importance since it is essential to reaching distant and diverse audiences and making sure that all students have access to high-quality educational materials.

Objectives:

The AVRC's goals are intended to complement the more general objectives of democratising education and improving academic learning via technology:

- Encourage Accessible Education: By producing multimedia content that can be aired or viewed online, AVRC seeks to ensure that education is accessible to students from all socio-economic levels.

- Encourage distant Learning: AVRC supports distant education programs by creating instructional audio-visual content that makes academic resources accessible to students in underserved or remote areas.

- Improve Academic Learning with Multimedia: AVRC's content is made to be an engaging learning experience, frequently using visual aids, animations, and graphics to make difficult subjects more approachable and fascinating.

- Promote Interactive Learning: AVRC strives to provide content that actively involves students, creating an atmosphere in which they may engage with the subject matter and improve their memory of it.

- Complement Conventional Learning Resources: Students can have a more thorough grasp of their subjects by using AVRC content as an adjunct to textbooks and lectures.

- Support Professional and Vocational Training: In order to meet the needs of students seeking to develop workforce-ready skills, AVRC also strives to create content that is beneficial for professional and vocational training.

- Encourage Research and Innovation in Education Technology: By experimenting with cutting- edge content distribution strategies, AVRC hopes to advance the field of educational technology and improve the caliber and accessibility of instruction

Composition:

The diverse departments and teams that make up AVRC collaborate to create top-notch instructional media content. Usually, the composition consists of:

Content Development: The content development team, which is made up of researchers, educators, and subject matter specialists, makes sure that the material is up to date with current curricular requirements and is academically correct.

Production Team: The technical facets of video and audio production, from filming to post- production, are handled by the production crew, which consists of directors, producers, editors, and camera operators.

Technical Support: To manage transmissions, diagnose technical issues, and maintain and operate the equipment, AVRC maintains a technical team.

Department of Media and Animation: This group is responsible for producing images, animations, and other visual components that enhance and simplify the material.

Scriptwriters and Narrators: Scriptwriters are in charge of creating the content's scripts, making sure that the language is understandable, interesting, and suitable for the intended audience. Voice-over artists or narrators give the material their voices, making the scripts come to life

Research and Quality Control: To ensure ongoing development, this division studies new developments in educational technology and assesses how well AVRC's content works.

Distribution and Outreach: Whether via broadcast channels, internet platforms, or direct distribution to educational institutions, the distribution team strives to make AVRC programming broadly available.

Roles & Functions:

The entire range of media creation and distribution is covered by the roles and responsibilities of AVRC:

- Creating Educational Content: The main responsibility of AVRC is to provide accessible and academically relevant video and audio content that covers a wide range of topics, from professional skills and vocational training to the sciences and humanities.

- Broadcasting Educational Programs: AVRC works with radio and television networks like Gyan Vani and Gyan Darshan, which provide dependable and organized learning opportunities by broadcasting educational content to a national audience.

- Supporting Digital Learning Platforms: In addition, AVRC supplies content for online self-paced learning platforms such as e-PG Pathshala and SWAYAM Prabha.

- Training Teachers and Content Creators: To assist teachers in creating and delivering successful multimedia content in the classroom or online, AVRC hosts workshops and training sessions.

- Encouraging Digital Literacy: AVRC encourages students to become familiar with digital media as an instructional resource by creating content that is accessible on a variety of platforms.

- Quality Control and Feedback Gathering: To keep its materials current and useful, AVRC continuously examines and revises its content in response to input from teachers and students.

- Research and Innovation in Media Education: AVRC conducts studies to investigate novel approaches to enhancing the impact and engagement of instructional materials. This involves testing out cutting-edge tools like virtual reality, interactive video, and online tests.

Challenges:

Even though AVRC has improved educational accessibility significantly, there are still a number of obstacles that limit its efficacy:

- Limited Funding and Resources: AVRC frequently works with tight budgets, which can limit its capacity to spend in R&D, hire qualified personnel, and modernize equipment. For AVRC to increase its reach and enhance the caliber of its content, sufficient money is necessary.

- Technological Restrictions: Although AVRC has embraced digital media, not all parts of India have equal access to technology. The inability of certain regions to provide essential infrastructure, such dependable internet or energy, restricts AVRC's capacity to reach all of its target students.

- Audience Engagement: Since instructional audio and video materials must contend with other entertainment mediums, it might be difficult to guarantee that students actively participate in the material. To keep students interested, AVRC must make its content more engaging and participatory.

- Adapting to Diverse Learning Needs: AVRC must create inclusive and accessible content because of India's diversity in languages, cultural backgrounds, and learning capacities. It's still difficult to translate content into several languages and produce products that are flexible.

- Assessing Educational Impact: Because there are few opportunities for direct student interaction, it is difficult to gauge how AVRC's material affects learning results. More reliable techniques for assessing the efficacy of AVRC's materials would be advantageous.

- Keeping Up with Educational Trends: New trends like virtual reality (VR) and artificial intelligence (AI) are emerging as the field of educational technology constantly changes. To maintain its information current and relevant, AVRC must adjust to these developments.

15.5.2 EMRC

An important project in India is the Educational Multimedia Research Centre (EMRC), which aims to improve the quality of education in higher education institutions by utilizing technology and multimedia. EMRC was founded under the auspices of the University Grants Commission (UGC) with the goal of producing, refining, and sharing instructional multimedia materials. EMRC is at the vanguard of educational innovation, working to close the gap between conventional learning techniques and contemporary, technology-driven approaches in light of the swift growth of technology and its effects on education.

In order to make learning more interesting, efficient, and accessible, EMRC was established with the knowledge that multimedia resources—which include audio, video, animations, and interactive tools—are essential. EMRC wants to improve learning outcomes by leveraging technology to enhance the educational experience for both teachers and students. Modern facilities at the center allow for the creation of excellent instructional materials that are suited to the requirements of various Indian learners.

Objectives:

EMRC's goals are made to complement its aim to use multimedia to improve educational quality and accessibility. The following are some of the main goals:

- Production of instructional Content: EMRC wants to create a variety of instructional multimedia resources that cover a range of topics and disciplines. These resources will include interactive content, animations, and films.

- Improving Learning Experiences: EMRC aims to make learning more effective and interesting while accommodating a variety of learning preferences and styles by integrating multimedia components into teaching and learning procedures.

- Promoting Open Educational Resources (OER): EMRC supports the creation and utilization of OER, which gives educators and students free access to excellent educational materials.

- Assisting Faculty Development: The center's primary goal is to teach teachers how to use multimedia tools and resources efficiently so they can incorporate technology into their lesson plans.

- Encouraging Research and Innovation: EMRC encourages research in multimedia and educational technology, which leads to innovations in learning approaches and content delivery.

- Partnership with Educational Institutions: In order to provide specialized multimedia content that satisfies particular academic requirements, EMRC seeks to partner with colleges, universities, and other educational establishments.

- Extending Reach and Accessibility: EMRC works to ensure that everyone, particularly in underserved and distant locations, has access to high-quality education by creating content that can be shared across a variety of media, including as radio, television, and internet platforms.

Composition:

Each team and department that makes up EMRC contributes to the organization's overarching goal of using multimedia to improve education. The essential elements consist of:

- Subject matter specialists, instructional designers, and educators make up the content development team, which is in charge of creating the instructional materials. They guarantee that the resources are in line with curriculum standards and have a strong academic foundation.

- Creation Team: The directors, producers, camera operators, and audio-visual specialists that oversee the technical facets of multimedia creation make up the production unit. They strive to produce interactive information, animations, and movies of the highest caliber.

- Department of Graphic Design and Animation: This group is responsible for producing eye- catching visuals and animations that complement the instructional materials. Their efforts are essential in simplifying difficult ideas.

- Technical Support and IT Team: This group oversees EMRC's technical infrastructure, which includes digital resource management, software support, and equipment upkeep. They guarantee the center runs smoothly and effectively.

- Research and Development Unit: A specialized R&D unit within EMRC investigates novel technologies and approaches in educational multimedia. To find new trends and industry best practices, our team carries out research.

- The quality assurance team is in charge of assessing the created content's efficacy to make sure it satisfies quality standards and produces the intended learning results.

- Team for Outreach and Distribution: This division is responsible for distributing the multimedia materials produced by EMRC. They strive to increase the accessibility of educational resources using a range of media, such as internet platforms, broadcasting, and collaborations with educational institutions.

Roles & Functions:

In the context of Indian higher education, EMRC performs a number of crucial tasks and functions, including:

- Creation of instructional Multimedia Content: EMRC's main responsibility is to provide excellent instructional multimedia materials covering a wide range of topics. This material is meant to be interesting, educational, and appropriate for a range of skill levels.

- Learning Module Development: EMRC develops thorough learning modules with multimedia components. These courses can be utilized online or in conventional classroom settings and are made to support self-paced learning.

- Training & Capacity Building: To give teachers the tools they need to successfully incorporate multimedia into their lesson plans, EMRC hosts workshops, seminars, and training sessions. Promoting the use of technology in education requires this capacity-building program.

- Collaborative Projects: To create multimedia content that is suited to certain curriculum requirements, EMRC works with organizations and educational institutions. These partnerships contribute to the creation of effective and pertinent information.

- Research and Innovation: To investigate cutting-edge teaching methods and technology, EMRC regularly

conducts research. The creation of new instructional strategies and content is informed by this study.

- Evaluation and Assessment: To determine the efficacy of its instructional resources, EMRC uses evaluation procedures. Feedback from educators and students is gathered in order to continuously enhance the quality of the content.

- Promotion of Open Educational Resources: By providing educators and students with free access to its multimedia content, EMRC promotes the usage of open educational resources. The democratization of education is supported by this dedication to transparency.

Contribution To Higher Education:

EMRC has made substantial and varied contributions to Indian higher education.

- Improving Learning Quality: EMRC has helped to raise the standard of instruction in higher education institutions by creating excellent educational multimedia materials. Students are more engaged and have a better understanding of difficult subjects when they are exposed to multimedia content.

- Increasing Access to Education: Students in underserved and distant locations have benefited greatly from EMRC's dedication to developing accessible educational resources. Access to the center's materials is possible via a number of channels, such as broadcasting services and internet platforms.

- Supporting Faculty Development: Teachers are now more equipped to use multimedia resources in their instruction thanks to EMRC's training initiatives. Better teaching methods and a more stimulating learning environment for students are the results of this help.

- Promoting Research in Educational Technology: A culture of inquiry in educational technology has been cultivated by EMRC's emphasis on research and innovation. EMRC helps to advance teaching and learning by promoting researchers and educators to try out novel approaches.

- Promoting Collaborative Learning: As a result of EMRC's collaborations with colleges and institutions, specialized educational materials that cater to the unique requirements of different fields have been created. This cooperative method guarantees that the generated content is worthwhile and pertinent.

- Encouraging Lifelong Learning: By giving users access to educational resources that are appropriate for a range of audiences, EMRC's offerings encourage lifelong learning. EMRC's programs are made to support lifelong learning, whether the learners are professionals looking to improve their abilities or students in formal education.

- Raising the Bar for Educational Multimedia: EMRC has made a name for itself as an industry pioneer in India's educational multimedia space. Its dedication to quality and innovation sets the standard for other businesses and institutions who provide instructional content.

15.5.3 INTEL:

One of the biggest and most significant tech firms in the world, INTEL Corporation is well recognized for producing semiconductors and innovating in computer technologies. Since its founding in 1968, INTEL has played a key role in the advancement of microprocessors and cutting- edge computing solutions that power a wide range of gadgets, including servers, smart phones, and personal computers. With its global operations and Santa Clara, California, headquarters, the corporation is influencing technology in a number of industries, including education.

INTEL has acknowledged the revolutionary potential of technology to improve teaching and learning in the field of education. INTEL seeks to assist educators and students in utilizing technology to enhance learning outcomes by offering state-of-the-art hardware and software solutions, along with educational initiatives and resources. The company's numerous initiatives and collaborations, which aim to incorporate technology into classrooms and support creative teaching approaches, demonstrate its dedication to education. With education shifting more and more to digital platforms, INTEL has established itself as a major force in encouraging the use of technology in the classroom. INTEL is striving to bridge the digital divide, create a more accessible and equitable educational environment, and raise a generation of students with the skills they need to succeed in the twenty-first century by providing tools that empower educators and engage students.

Objectives:

INTEL's goals in the field of education demonstrate its dedication to using technology to improve learning. The following are some of the main goals:

- Improving Educational Access: INTEL wants to increase educational access by offering technological solutions that let more students engage in the learning process, especially in underprivileged communities.

- Encouraging Innovative Teaching Practices: INTEL aims to enable teachers to embrace cutting- edge teaching strategies that use technology to enhance student engagement and learning results by providing them with tools and resources.

- Promoting Digital Literacy: INTEL highlights how crucial digital literacy is in the modern society. The organization wants to give students the tools they need to thrive in a technologically advanced environment.

- Promoting STEM Education: In recognition of the need for a workforce proficient in these vital fields, INTEL actively supports STEM education through a number of initiatives.

- Developing Sustainable Solutions: In order to ensure a brighter future for future generations, INTEL is dedicated to creating sustainable technology solutions that improve education while reducing their negative effects on the environment.

- Working with Educational Institutions: In order to jointly create and carry out technology-driven projects that cater to the individual needs of students, INTEL aims to form alliances with colleges, universities, and educational institutions.

- Research & Development: To develop cutting-edge educational technologies that tackle new issues and trends in education, INTEL makes research and development investments.

Composition:

The teams and collaborations that make up INTEL's educational efforts are varied and all support the organization's goals in the field of education:

- The goal of the research and development team is to create and enhance technological products that may be applied in educational environments. They study how technology may improve the process of teaching and learning.

- Education Program Managers: These experts are in charge of creating and overseeing INTEL's educational projects and activities. To comprehend their demands and create solutions that meet them, they collaborate closely with educators.

- Team for Technical Support and Training: This group offers institutions and teachers integrating INTEL technology in the classroom technical support and training. They guarantee that users can make efficient use of the resources at their disposal.

- Cooperation with Educational Institutions: To assist technology integration in education, INTEL works with a range of educational institutions, including colleges and universities, to jointly develop programs, resources, and content.

- Team for Corporate Social Responsibility (CSR):INTEL frequently focuses on education through their CSR activities, which use technology to enhance educational access and assist underserved populations.

- Promoting INTEL's educational programs and materials, increasing public awareness of the value of technology in education, and contacting possible partners and stakeholders are the main objectives of the marketing and outreach team.

- International Partnerships: To advance educational technology programs, exchange best practices, and pool resources for maximum impact, INTEL actively participates in international partnerships with businesses, governments, and non-governmental organizations.

Roles & Functions:

INTEL contributes to the development of educational technology in a number of ways, all of which are essential to the educational landscape:

- Technology Solution Provider: INTEL creates and offers a variety of hardware and software solutions that improve instruction. Processors, tablets, laptops, and instructional software are all included in this.

- Facilitator of Professional Development: INTEL provides educators with professional development opportunities that enable them to successfully incorporate technology into their teaching methods. To get the most out of technology in the classroom, this training is necessary.

- Champion of STEM Education: INTEL supports STEM education through a number of programs, providing funding, resources, and curricula for programs that inspire students to choose professions in science and technology.

- Collaborative Partner: To provide specialized solutions that address particular needs, INTEL works with educational institutions. The target audience will find the technology useful and relevant thanks to this cooperation strategy.

- Promote Digital Literacy: INTEL supports the inclusion of digital literacy in school curricula since it acknowledges its significance. The business creates programs and materials to assist students in learning critical digital skills.

- Research and Innovation Leader: To find new trends and problems in education, INTEL carries out research. The creation of new methods and technology that deal with these problems is influenced by this research.

- Global Impact Initiator: INTEL aims to significantly impact education globally through its outreach activities, with a particular emphasis on closing the digital divide and giving marginalized groups access to opportunities.

Global &Local Impact:

INTEL's dedication to improving educational results through technology is demonstrated by the global and local effects of its contributions to education:

- International Outreach Programs: INTEL has started a number of international programs to enhance education in underdeveloped nations. These initiatives help to improve educational quality and equity by giving teachers and students access to resources, training, and technology.

- Partnerships with Governments and NGOs: INTEL works with government and non- governmental organizations to put educational policies and programs that support technology integration in schools into action. These collaborations frequently produce scalable solutions that are replicable in various settings.

- Localized Programs: INTEL prioritizes local requirements in addition to global activities by creating customized programs that target certain educational issues in various geographical areas.

- Promotion of Digital Literacy: Students and educators around the world have been empowered by INTEL's initiatives to promote digital literacy. INTEL is helping to prepare students for future employment in a technology-driven economy by giving them the fundamental digital skills they need.

- Support for STEM Education: As a result of INTEL's dedication to STEM education, a number of initiatives have been developed to encourage students to pursue careers in science and technology.

- Impact of Research and Development: Innovative solutions to today's educational problems are developed as a result of INTEL's continuous research in educational technology. INTEL is contributing to the development of the educational landscape by emphasizing research-driven approaches.

15.6 Check Your Progress No 2:

- Effective integration of...............into the educational system is the main goal of the CES (UGC) CIET.

  (Answer: Technology)

- AVRC, which stands for................,is a center that specializes in resources for audio-visual education. Center.

  (Answer: Audio-Visual Resource)

- The creation and development of…………resources for higher education is one of EMRC's primary responsibilities.

  (Answer: Multimedia)

- INTEL Is well-known throughout the world for its contributions to digital literacy and……………

  (Answer: Technological innovation)

- Experts in both ……………. and fields makeup the CES (UGC) CIET.

  (Answer: Education, Technology)

- AVRC uses...............resources to help with visual and auditory learning in order to solve educational problems.

  (Answer: Audio-visual)

- EMRC's emphasis on higher education promotes standards by creating resources and media.

  (Answer: Academic)

- The promotion of................education is one of INTEL's main effects on education.

  (Answer: Digital)

- Through the use of..............., resource centers such as CES (UGC) CIET, AVRC and EMRC seek

to Increase access to education.

(Answer: Technology)

- CES (UGC) CIET's function in education is to use technology to improve................learning.

(Answer:Teaching)

15.7 LET US SUM UP:

In the field of educational technology, resource centers are essential since they greatly improve the methods of instruction and learning. A diverse strategy for improving education through innovation and technology is revealed by this examination of several resource centers, such as the CES (UGC) CIET, AVRC, EMRC, and INTEL

In order to advance educational technology, resource centers such as CES (UGC) CIET, AVRC, and EMRC are essential. The main goal of CES (UGC) CIET is to improve learning outcomes by incorporating technology into the curriculum. The Audio-Visual Resource Center, or AVRC, offers audio-visual materials to promote inclusive education, but it has trouble keeping up with the quick changes in technology. By creating multimedia instructional materials, the Educational Media Research Center (EMRC) promotes higher education and raises academic standards. Through its educational programs, INTEL encourages global digital literacy and gives teachers and students the necessary technological know-how. By strategically utilizing media and technology, these institutions and projects collectively seek to increase the effectiveness and accessibility of education.

15.8 KEYWORDS/GLOSSARY

(CES) (UGC) : The Consortium for Educational Communication (UGC) supports India's varied educational needs by delivering instructional content through satellite transmissions and other media.

CIET: With an emphasis on inclusive, techdriven education, the Central Institute of Educational Technology (CIET) seeks to incorporate contemporary digital tools into the classroom.

EMRC: The Educational Multimedia Research Centre, or EMRC, is a facility that creates educational multimedia content, including animations, audio, and video.

STEM: Education is the study of science, technology, engineering, and mathematics with the

goal of educating students for such occupations.

AVRC: A facility dedicated to developing educational audiovisual resources to improve learning Through multimedia content is called the Audio-Visual Research Centre, or AVRC.

Digital Literacy : Proficiency in digital tools and technology for information creation, evaluation, and access is known as digital literacy.

Open Educational Resources, or OERs, are accessible digital learning resources that may be shared, altered, and reused.

Educational Technology Resource Centers (ETRCs) are facilities or organizations committed to the creation, integration, and distribution of digital instructional materials to help and improve teaching and learning

15.9 SELF-ASSESSMENT QUESTIONS

Q1. In what ways does CIET assist students with different language backgrounds?

Q2. What function does INTEL serve in the field of educational technology

Q3. What role does multimedia content play in education?

Q4. What is the main goal of Educational Technology Resource Centers (ETRCs)?

15.10 SUGGESTED READINGS

- **"Educational Technology:A Primer for the 21ˢᵗ Century"** by Sharmila Sharma

- **"Technology and the Classroom: Practical Applications and Integration"** by Dale Johnson

- **"Educational Television in India: A Critical Assessment"** by Ramesh Chand

- **"Multi media Learning in Educational Institutions"** edited by Sanjay Verma

- **"Distance Education and Educational Technology"** by M.S. Ansar

- **"21st Century Skills: Re thinking How Students Learn"** by James Bellanca and Ron Brandt

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