
UNIT 1 MEANING AND NATURE OF INFORMATION COMMUNICATION TECHNOLOGY(ICT)

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1.1 INTRODUCTION

You may be aware of the use of different technologies such as radio, television, computer, etc., in the teaching-learning process. In fact, all these technologies have transformed the teaching and learning process. Radio, television and newer digital technologies such as computers, mobile and the Internet constitute Information and Communication Technologies,. They have been visualized as powerful teaching- learning tools for optimizing learning outcomes of learners.

This Unit has been adapted from Unit 1 of MES-031: ET: An Overview, Unit 8,12 and 13 of BES-002: Teaching-Learning and Assessment of IGNOU.

Different ICTs have potentiality to expand the access to education, strengthen the process of education and enhance the quality of education. The present Unit is an attempt to give you an understanding of the concepts of educational technology and information and communication technologies (ICT) as well as to introduce you to various ICTs briefly.

1.2 OBJECTIVES

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

- explain the concept of ‘educational technology’;
- differentiate between technology in education and technology of education;
- classify various types of educational technology;
- explain the meaning and nature of ICT;
- describe various audio and audio-visual media;
- describe the various components and types of computer;
- explain the meaning of E-learning;
- discuss various communication technologies used in E-learning;
- differentiate between E-learning and traditional learning;
- explain the meaning of Internet; and
- discuss the advantages and applications of Internet in education.

1.3 CONCEPT OF EDUCATIONAL TECHNOLOGY

You, as a teacher, must be using technology in your classroom teaching to make your presentations more effective. But to most people, the term ‘educational technology’ is associated only with the equipment or the hardware part, which they use such as overhead projector, television, computers, etc. But the concept of educational technology should not to be confused with the electronic gadgetry; it has a wider meaning as wide as education itself. By this it means that educational technology is concerned with the design and evaluation of the curriculum and learning experiences to be provided and also with the problems of implementing it.

Let us understand the meaning of the term ‘educational technology’ by splitting it into education and technology, Technology, as we understand, refers to the systematic application of techniques and principles to achieve an objective. Technology results in new designs and devices to improve human productivity. Education is the process of acquiring and imparting knowledge crucial to the development of a learner, Therefore, it can be concluded that the educational technology would be the application of the principles of education to improve human learning.

There have been a number of definitions of educational technology which have been produced over the years; let us go through them to get the better understanding of the term ‘Educational Technology’.

“Educational Technology is the development, application and evaluation of systems, techniques and aids to improve human learning.” (National Council for Educational Technology for the United Kingdom” (NCET, 1967)

Another definition by National Center for Programmed Learning, has put the term of Educational Technology as “*Educational Technology is the application of the scientific knowledge about learning, and conditions of learning, to improve the effectiveness and efficiency of teaching and training. In the absence of the scientifically established principles, educational technology implements techniques of empirical testing to improve learning situation*”.

Derik Unwin (1969) has also defined educational technology as ‘*the application of modern skills and techniques to the requirements of education and training.*’

G.O.M. Leith (1975) defined “educational technology” as “an application of scientific knowledge about learning and conditions of learning to improve the effectiveness and efficiency of teaching and learning”.

According to UNESCO, “Educational technology is a communication resulting from the application of the scientific methods to the behavioral science of teaching and learning. This communication may or may not require the use of media such as television broadcasts, radio, cassettes etc.”

The main components of this communication process as given by UNESCO are as follows:

- a) Goals or the behavioral objectives,
- b) Analysis of the characteristics of learners,
- c) Selection and organization of content,
- d) Selection of media,
- e) Evaluation, and
- f) Feedback.

After going through all the above definitions of the educational technology, you can conclude that the chief role of educational technology is to improve the effectiveness and efficiency of the teaching and learning process. Educational technology as it exists today is the result of the integration of the technological devices with the newly explored psychological principles of learning, teaching, behavioral modification, etc.

In short, educational technology, in its widest sense can be understood to be including the development, application and evaluation of systemic knowledge about learning and instruction to teaching and training with the aim of improving their quality and efficiency.

According to Ellington et.al. (2005), this increase in the efficiency due to the use of educational technology in various situations can be manifested in many different ways, which are as follows;

- a) Increasing the quality of learning or degree of mastery among the learners;
- b) Decreasing the time taken by learners to attain the desired goals;
- c) Increasing the efficiency of teachers in terms of numbers of learners taught, without reducing the quality of learning;
- d) Reducing costs, without affecting the quality; and

- e) Increasing the independence of learners, and the flexibility of education and training provisions.

The scope of educational technology encompasses educational objectives, media and other characteristics, criteria of selecting media and resources, management of resources as well as their evaluation.

Till now, we have discussed that educational technology is the means for effective learning. But the effective learning could only come through the effective application of educational technology, which in turn is dependent upon the proper integration of hardware with the appropriate software. For example, an interactive television, which is a highly developed hardware, cannot provide quality output if it does not have quality educational programmes.

Now, this is understood that both the hardware and the software are needed for the effective use of Educational Technology. Although hardware is an important component, but it is of little use if suitable software is not available. Thus what is needed is both technology in education and technology of education. Let us reflect on these terms more closely.

1.3.1 Technology in Education: Hardware Approach

Technology in education is also called the hardware approach to educational technology because it is concerned with the electronic gadgets such as television, radio, language labs and various other projected media, which are being used to educate learners. Technology in education includes tangible aspects of technology. This side of educational technology has been derived from the principles of physical sciences, as the main thrust is on the development of the electronic equipment like monitors, cameras etc which could be used in the teaching-learning process.

1.3.2 Technology of Education: Software Approach

Technology of education approach to educational technology involves a systematic, scientific application of appropriate scientific research, both from the physical sciences and from the social sciences such as psychology and sociology to solve a problem. Here, it is important to understand that *Technology of Education* emphasizes on the techniques of teaching and learning derived from the principles, ideas and practices drawn from various fields of knowledge like psychology, sociology, philosophy, management studies, cybernetic, etc. in order to optimize the teaching-learning process. In other words, we can say that the technology of education includes 'intangible' aspect of education. For example, teachers or trainers use a number of methods and techniques while organizing instructional programmes. Methods like inquiry teaching, simulated teaching, programmed instruction, computer-assisted instruction are the results of application of pedagogic principles derived from psychology of education.

1.4 CLASSIFICATION OF EDUCATIONAL TECHNOLOGY

Teaching-learning aids are classified in several ways. Edgar Dale's cone of experience provides us with one such possibility of classifying them. Educational technologies are classified on the basis of four important characteristic, viz.

stimulations provided to the sense organs, learner's control over media, types of experience they provide, and their reach. The most widely used classification is on the basis of the senses that are stimulated by educational technologies. These can be classified as follows:

I) Visual (Verbal) Print or Duplicated

- Textbook, Supplementary Book
- Reference books, Encyclopedia, etc.
- Magazine, Newspaper, etc.
- Documents and Clippings
- Duplicated Written Material
- Programmed Learning Material and Self-instructional Modules
- Case Studies (Simulating Reality) and Case Report

II) Visual (Pictorial) Non-projected Two-dimensional

- Blackboard Writing and Drawing
- Charts
- Posters
- Maps
- Diagrams
- Graphs
- Photographs
- Cartoons
- Comic Strips

III) Audio

- Human voice
- Gramophone records
- Audio tapes/discs
- Stereo records
- Radio broadcast
- Telephonic conversation

IV) Visual Non-projected Three-dimensional

- Model
- Mock-up
- Diorama
- Globe
- Relief Map
- Specimen
- Puppet
- Hologram

V) **Visual Projected (Still)**

- Slide
- Filmstrip
- Transparency (OHP)
- Microfilm, Microcard
- Computer

VI) **Audio-visual Projected (With Motion)**

- Motion Picture Film
- Television
- Close-circuit Television
- Video Cassette/Disc

VII) **Multi-Media packages (for more than one sense)**

- Slide + tape + workbook
- Radio + slide or posters (Radio vision)
- Film + posters + workbook (print materials)
- Television + workbook (print materials)
- Any of the above + group discussion
- Any of the above + introductory and summarizing talk by teacher/leader of the group.

VIII) **New emerging media (all of these are multisensory)**

- Tele-conferencing (group discussion through telephones)
- Cable television
- Satellite television/communication satellites
- Computer networking
- Video discs
- Mini computers/micro computers/word processors.

Source: S.S. Kulkarni, (1986). *Introduction to Educational Technology*, Bombay: Oxford & IBH Publishing Co., pp. 143-144:

New emerging media also include Internet, Mobile technology, etc.

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

1) Define educational technology in your own words.

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- 2) Differentiate between technology in education and technology of education.
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1.5 MEANING AND NATURE OF ICT

Information Technology (IT) and Information and Communication Technology (ICT) are very often interchangeably used in the context of modern technology infrastructure. ICT is a broad and comprehensive term, which comprises information technology and communication technology. Information technology includes radio, television, computer and Internet, teleconferencing and mobile. All these information technologies are powered by mainly two types of communication technologies. These are satellite based communication and terrestrial based communication. Satellite based communication is the communication, which takes place between sender and receiver through a communication satellite whereas terrestrial based communication is the communication, which takes place through a network of transmitters spread across a geographical area, a country, or a state. This type of communication is used in the transmission of radio and television in India. However, with the launch of a series of satellites by Indian Space Research Organization (ISRO), satellite based communication is being used for telecommunication. The components of ICT are presented in Fig.1.1.

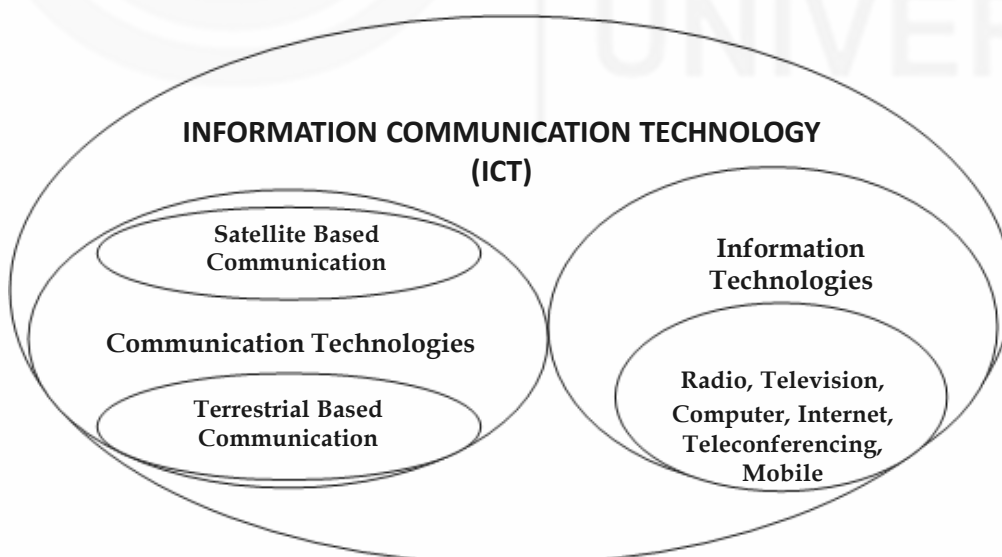


FIG. 1.1: Components of ICT

Communicating information effectively by making use of appropriate technology is called information and communication technology (ICT). In all, ICT is an umbrella term that includes many communication devices such as radio, television, cellular phones, computers and network, satellite systems and so on.

There are many definitions of ICT. ICTs are defined, as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.” These technologies include *computers, the Internet, broadcasting technologies (radio and television), and telephony, etc.*

According to the United Nations Development Programme (UNDP): “*ICTs are basically information handling tools — a varied set of goods, applications, and services that are used to produce, store, process, distribute and exchange information. They include the “old” ICTs of radio, television and telephone, and the “new” ICTs of computers, satellites and wireless technology and the Internet. These different tools are now able to work together, and combine to form our “networked world”, a massive infrastructure of interconnected telephone services, standardized computer hardware, the Internet, radio and television, which reaches into every corner of the globe.*”

According to C-DEC, Department of Information Technology, Government of India “*the term, information and communication technologies (ICT), refers to forms of technology that are used to transmit, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software; as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs.*”

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

3) Explain the term ‘ICT’?

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4) On the basis above discussion, enlist the technologies, which are included under ICT?

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1.6 AUDIO MEDIUM

Your voice is the most common form of audio medium, which may be used in classroom teaching. You use voice to communicate with others. Voice creates sound, which delivers message to others.

Sender —————→ Sound/message —————→ Receiver

In a classroom when a teacher talks, the message is sent to students in the form of sound. It is one of the most natural ways of communicating.

To make your voice effective medium of communication you should modulate your voice; express your feelings; emphasis, pause at appropriate places. The skills of using voice as an effective classroom transaction are integral part of teacher training programme.

Many audio teaching learning resources are available to make classroom teaching effective

1.6.1 Radio

Radio is a popular mass medium, which has been with us from very early times. It is also widely used and most accessible ICT in the country. These days all of us are tuned to Radio through FM channels. Popularity of Radio is due to its easy access, speed and immediacy. Back in 1917 radio was visualized as means for mass education. In India, first radio station was established in Mumbai (Bombay) in July 1927. Two more radio stations in Calcutta and Delhi were established in 1936. All India Radio (AIR) broadcasted radio programmes for the country. In 1937 Calcutta station broadcasted school programmes for the first time and it continues until date.

School educational programmes are still in demand and are used by teachers to generate interest of students. **Gyan Vani** is a dedicated FM channel for educational broadcasts. It is used to broadcast educational programmes from Educational Media Production Centre (EMPC) of Indira Gandhi National Open University (IGNOU), New Delhi. Audio programmes developed by Central Institute of Educational Technology (CIET) of National Council of Educational Research and Training (NCERT) for school children are also broadcast by Gyan Vani.



Fig 1.2: A Radio

Source: <http://commons.wikimedia.org/wiki/Radio>

Radio is used to-

- broadcast lectures by eminent educationists, scientists, etc.
- broadcast drama, stories, commentary, news, etc

Radio is popular all over country, urban as well as rural settings.

While preparing Radio programmes selection of topic is very essential. Topic should support verbal communication i.e. verbal inputs are needed to topic. Sound, music, special effects are added to audio programmes to make it interesting and effective. It helps in creating visual images through sound and thus enriches imagination in children. CIET, State Institute of Educational Technology (SIET) and educational technology divisions of SCERTs produce topic and need based audio programmes for school children.. IGNOU also produces audio programmes for its student teachers enrolled in teacher education programmes. .

1.6.2 Audio CD/DVD

Audio recordings in the form of CD or DVD are very popular teaching-learning resource. Stories, poems, songs are frequently used in secondary classes. Discussion and debates with important personalities can be recorded and prepared in the form of Audio CD to be used in classroom to motivate students. NCERT, National Institute of Open Schooling (NIOS) prepare Audio CD/DVD for children which are very effective teaching-learning resources.

You can use a DVD or CD player with speakers in your classroom to see these audio CD/DVD. You may also prepare your own audio CD/DVD, using your mobile, voice recorder or softwares on computer.

1.6.3 Podcast

Radio is a mass broadcast medium whereas Podcasts are personalized broadcasts. Podcasts are prepared for specific target and made available to the target group for specific learning objectives. Podcast consists of two words: 'pod' from iPod and 'cast' from broadcasting.

Suppose, you want to narrate a story to your class. You record it and play in your classroom teaching. If children want to hear it at home, you can make it available through Podcasts. Podcasts can be easily made using computer software.

Podcasts are uploaded on web to be listened at any place and any time. Students can download it to hear at any convenient time and place.

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

5) How will you make your voice an effective medium of communication?

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- 6) True or False
- i) Educational Radio Broadcast is known as Rainbow.
 - ii) Podcast means personalized Broadcast.
 - iii) Radio can be listened to at any time according to one's convenience.
 - iv) Podcast can be used at any time by anyone.

1.7 AUDIO VISUAL MEDIUM

It is the most effective medium of ICTs and thus generates interest and motivate learners. Televisions, Video, Multimedia programmes, interactive video are audio-visual ICTs used by teachers.

1.7.1 Television

Television is another important medium of disseminating information to its viewers. It is a combination of audio and visual technology, and thus considered to be more effective than audio medium like radio. You must have seen the use of television for multiple purposes of entertainment, information and education. Because of its better accessibility, it can bring learning materials to the masses in more direct, effective and personal way than other educational media.

Television named as 'Doordarshan' started its service on Sept 15, 1959, as the National Television Network of India. In India, since the inception of TV network, television has been perceived as an efficient and effective medium of education and development. With its large audience it has been an efficient tool of imparting education to primary, secondary and university level students.

Some of the major educational television initiatives in India are **Secondary School Television Project (1961)**, **Satellite Instructional Television Experiment (SITE) (1975)**, **Post-SITE Project (1977)**, **Indian National Satellite Project (INSAT) (1982)**, **IGNOU-Doordarshan Telecast (1991)**, **Gyan-Darshan Educational Channel (2000)**, **EduSat, 2004 (a dedicated satellite for education and development launched by ISRO)**. With the help of EDUSAT, television programmes can now be telecast in almost every Indian language and every secondary school can be reached through this satellite to improve both quality and content of secondary education.



Fig 1.3: A Television

Source : <http://commons.wikimedia.org/wiki/Television>

if we have Audio Visual teaching-learning resources for capturing the attention of children, then learning will be interesting and effective. Educational programmes prepared by CIET for children are regularly broadcasted. SIETs produce programmes in local languages for children. .

Television is useful as it brings to children a wide variety of programmes in their local language. They can use it to learn about new things and then clarify the points they did not understand with their teacher.

As a teacher, you should try to prepare children to watch the programme. You should ask questions related to the topic being telecast on TV. This will raise their curiosity level and they will be more alert and focused while watching the TV programme. After watching the programme, there should be discussion. This will help in retention of the points learned and helps in consolidating the learning. Both pre and post screening discussions are important as they help in construction of concepts among learners.

1.7.2 Video CD/DVD



Fig 1. 4 : Video CD

Source: <http://commons.wikimedia.org/wiki/File:Cd-r.jpg>

Source: http://commons.wikimedia.org/wiki/File:CD_autolev_crop.jpg

Video programmes are developed on specific topics to be used in classroom teaching. A script is prepared and the programme is developed using cameras. Professionals generally develop video programmes. Though as a teacher, you can prepare short films for your students and make them available through CD or DVD for them to watch in class or later at their home. Video programmes may be run on DVD player as well as computer. CIET, NCERT has developed many Video CD and DVD s for school Children. NIOS develops programme for school children. Besides these organizations, many private organizations also develop programmes for children but the cost is more and thus not all children can be benefited by theses video programmes.

1.8 COMPUTER

All of us are familiar with computer. Computer is a device that operates systematically by accepting inputs from human operator, processes different kinds of data and provides outputs as per intended objectives. One can find different types of computers, which are meant for different purposes. Let us understand the basic components of a computer.

1.8.1 Basic Components of a Computer

A computer is a system comprising many parts working together. The different parts of a computer are:

- i) **Control Unit:** The control unit, often called a control system or central processing unit (CPU) manages the computer's various components. It reads

and interprets (decodes) the program instructions, transforms them into a series of control signals, which activate other parts of the computer.

- ii) **Arithmetic Logic Unit (ALU):** As the name indicates, the arithmetic and logic related operations of the computer are performed by ALU.
- iii) **Memory:** The memory of computer is the place where the information is stored. There are two types of memories:
 - a) **RAM (Random Access Memory):** RAM is the main 'working' memory used by the computer. RAM can be read and written to anytime the CPU commands it. The contents of RAM are erased when the power to the computer is turned off i.e. programs stored in RAM are volatile.
 - b) **ROM (Read Only Memory):** ROM memory Read Only Memory (ROM), as the name suggests, is a special type of memory chip that holds software that can be read, but not written to ROM, retains its data indefinitely even if the power is switched off. Hence, programs stored in ROM are non- volatile.



Fig.1.5: Components of a Computer

- iv) **Input/Output (I/O):** I/O is the means by which a computer exchanges information with the outside world. Devices that provide inputs or outputs to the computer are called peripherals. The different I/O devices are:
 - a) **Input Devices-**It is used to feed instructions to the computer. Mouse, Keyboard, Tracker Balls, Scanners, Touch Pads, Light Pens and Joysticks are some of the input devices.
 - b) **Output Devices-**After processing the data, output devices are used to provide the processed data. Monitor, Printers, Plotters, Speakers, and Speech Synthesizers are some of the output devices.
 - c) **Storage Devices-**Storage devices are used to store information. Hard Disks, Floppy Disks, CD-ROM Risks and DVD Drives are some of the storage devices.

1.8.2 Types of Computers

Computers can generally be classified according to size and power, though there is considerable overlap among them. Computers are also classified on the basis of physical structures and the purpose of their use. Based on capacity, speed and

reliability, they can be classified into five categories.

- i) **Personal Computer:** It is a small, single-user computer, based on a microprocessor. In addition to the microprocessor, a personal computer has a keyboard for entering data, a monitor for displaying information, and a storage device for saving data.
- ii) **Workstation:** It is a powerful, single-user computer. A workstation is like a personal computer, but it has a more powerful microprocessor and monitor with a higher-quality. It is a type of computer used for engineering applications (Computer Aided Design/ Computer Aided Management), desktop publishing and software development, etc.
- iii) **Minicomputer:** It is a multi-user computer capable of supporting users starting from ten to hundreds simultaneously. It is a midsize computer.
- iv) **Mainframe:** It is a powerful multi-user computer capable of supporting hundreds or thousands of users simultaneously. Mainframe is a very large and expensive computer.
- v) **Supercomputer:** An extremely fast computer that can perform hundreds of millions of instructions per second. Supercomputer is a broad term for one of the fastest computers currently available. Supercomputers are very expensive and are employed for specialized applications that require immense amount of mathematical calculations.

1.9 E-LEARNING

Emergence of Internet has influenced various fields of education. Can you identify any application of Internet in the teaching-learning process or in other activities of your school? As an extension of Internet technology, a new concept called e-learning has come into existence. There exist different definitions for E-learning. We will discuss definitions of E-learning, its applications at secondary level, etc.

E-learning is a broad term, encompassing a wide variety of electronic technologies used for educational purposes, and a wide variety of educational formats and designs (Bates and Poole, 2005; OECD, 2005; and Allen and Seamen, 2008). E-learning comprises all forms of electronically supported teaching and learning. E-learning helps learners learn at their own pace, anytime and anywhere with the help of computers, LCD projectors, TV, CD ROMs, electronic storage devices, web based tools, virtual classrooms, etc. If a teacher uses such devices in teaching-learning, it is termed as E-learning.

There are several variations of E-learning. These are CBT (Computer-Based Training), Technology-Enhanced Learning (TEL), Computer-supported collaborative learning (CSC), IBT (Internet-Based Training) or WBT (Web-Based Training), E-learning is also known as e-learning or e-Learning.

1.9.1 Goals for E-Learning

The broad goals of E-learning are as follows:

- It increases learners' access to learning and flexibility in learning;
- It enhances the quality and efficiency of teaching-learning process;

- Skills and competencies required of different subject areas are developed with e-learning strategies;
- E-learning techniques meet the learning styles of different students;
- The burden of cost of education can be minimized using e-learning. Hence, the education system becomes cost-effective.

1.9.2 E-learning and 21st Century Skills and Competencies

Various skills and competencies are required to lead successful life in the twenty first century. E-learning strategies help build up in the learners necessary skills needed for the twenty first century. The following skills are of great importance to future generation to succeed in life.

- Good communication skills (reading, writing, speaking, listening)
- Ability to learn independently
- Social skills (ethics, positive attitude, responsibility)
- Teamwork skills (collaborative learning, networking)
- Ability to adapt to changing circumstances
- Thinking skills (problem-solving, critical, logical, numerical skills)
- Knowledge navigation
- Entrepreneurship (taking initiative, seeing opportunities)
- Digital literacy

1.9.3 Communication Technologies Used in E-Learning

Communication technologies are generally categorized into asynchronous or synchronous. Both these types of communication technology used in E-learning are discussed in the coming sections.

Asynchronous: As the name indicates, the participants are in not in synchronous (same time) with each other in Asynchronous mode of communication. The participants mentioned here are mainly the students and teachers. Students and teachers move at their own pace to transfer information. The information to be

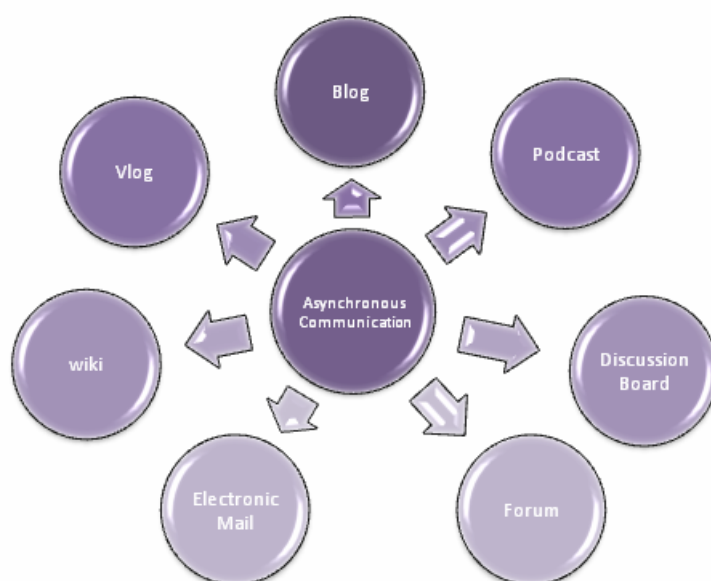


Fig.1.6: Various Communication Technologies used in E-Learning

passed on to the students may be posted on any website medium such as wikis, blog, etc., which can be retrieved by students at a later time. Similarly, postings of students can be retrieved by teachers and be given feedback. Hence in asynchronous communication, interaction between students and teachers occur at different times. Examples for asynchronous communication technology are blogs, wikis, video-blogs, vlog, forum, discussion boards, and electronic mail (E-mail).

Synchronous: In synchronous communication, interaction between teacher and students occur at the same period of time. Synchronous mode helps students acquire information within no time, since both are engaged in the process of conversation at the same time. Compared with asynchronous mode, synchronous communication is better for teaching –learning process. Earlier asynchronous mode was prevalent in teaching –learning process, but after the advent of information technology, the process of sending information became much easier, with the use of Internet and related applications of e-learning. The simplest form of synchronous communication occur with the participation of two persons i.e teacher and student, while in advance synchronous communication a large number of people can join to share their ideas like students belonging to different classes, students of the same classes, teachers of the same school, etc. Examples of synchronous communication are face to face talk through online, online chat, phone calls, video chat, virtual classrooms, video conferencing and audio conferencing.

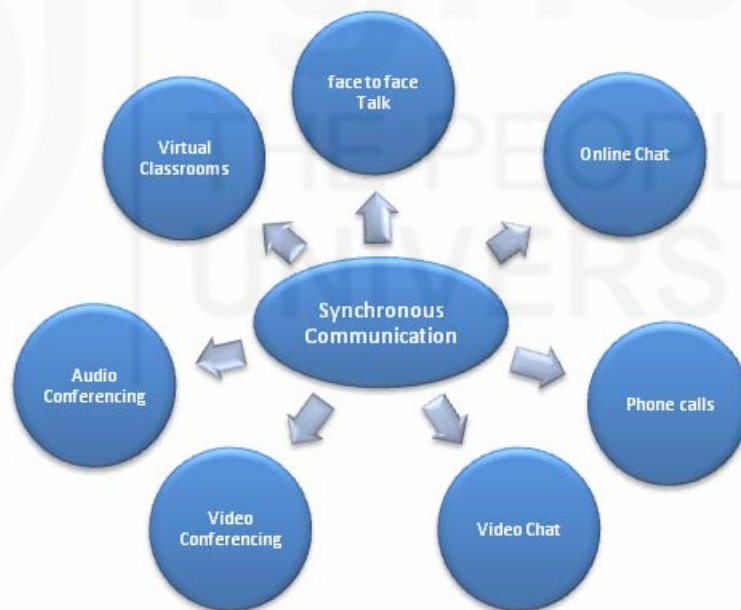


Fig.1.7: Various Forms of Synchronous Communication

Now the question is “how can secondary teachers make use of asynchronous mode of E-learning”? One of the methods is that the teacher can direct students to collect materials related to school assignments from Internet. Secondly, the teacher can arrange a debate on any topic through Skype or with any other chat software. Here students are asked to share their ideas through Skype or any chat room and finally teacher concludes the topic. But this mode of study requires computer facility with Internet connection and comes under synchronous style of E-learning.

Now we will discuss some strategies used for E-learning. These strategies belong to either synchronous or a synchronous mode. The various E-learning strategies are given below in diagrammatic form.

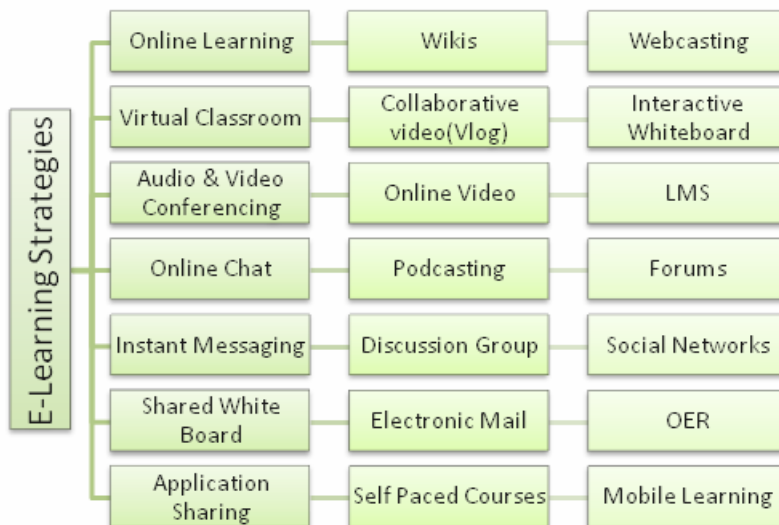


Fig.1.8: Various E-Learning Strategies

Now let us discuss these strategies separately.

Online Learning: Online learning is an Internet or Intranet-based teaching and learning system designed for web-based delivery, without face-to-face contact between teacher and learners. Internet is the main tool used in online learning. The other different tools used in online learning are either asynchronous (email, mailing lists, bulletin boards) or synchronous (text-based chat, audio chat, videoconferencing) in nature.

Virtual Classroom: A virtual classroom duplicates the context of a real classroom. In virtual classroom students and teachers use their computers to go to a virtual meeting place instead of a classroom. Students can indicate when they want to speak. Teachers can let students speak through audio and video conferencing. Teachers and students can use instant messaging and chat. Teachers can choose from a variety of synchronous technologies for interaction between them and students.

Audio and Video Conferencing: These are two type of strategies used in E-learning. In audio conferencing conversation happens between students and teachers without both of them seeing each other and while in video conferencing students and teachers can see each other.

Online Chat: Chat allows several people to communicate with each other. Each participant uses a computer to type his/her comments. The other participants can see the name of the persons and their comments.

Instant Messaging: Instant messaging is similar to chat. One person communicates to another through typing. Instant messaging also provides some additional features. With instant messaging, you can keep a list of people that you might like to chat with. The list will indicate if they are online, offline, available for chat or busy.

Shared Whiteboard: A shared whiteboard lets a group of people communicate by typing comments, drawing, highlighting and pointing. A shared whiteboard is a common feature within virtual classroom software packages.

Application Sharing: You can demonstrate how to use software applications to remote learners with application sharing. A teacher can also let learners take control of the application to practice performing tasks.

Self-Paced Courses: The obvious advantage of a self-paced course is convenience. People can get the training they need at any time. This can include just-in-time training where a person gets exactly the training he or she needs to perform a task. Self-paced courses are created with E-learning authoring tools. Self-paced courses can be delivered in many ways including Internet, Intranet or Local Area Networks, CD-ROM or DVD.

Discussion Groups: A discussion group is a collection of conversations that occur over time. It allows for comments to be posted and viewed by students and teachers as per their convenience. Other names for discussion groups are message boards, bulletin boards and discussion forums.

Electronic mail: It is one of the most popular tools used in E-learning. By definition it is mail delivered through electronic means. Today, e-mail is primarily known as communication from one person to another or many others through the use of computer and networks.

Podcasting: Podcasts are digital audio or video files containing meaningful content for learning that are available in websites and podcasting is the process of creating and distributing such learning material.

Online Video: Online videos are video files containing learning contents available in the Internet. Educational online videos are available in You Tube, Blip T1, and Google Video etc.

Blogs: Blog is a personal website that contains content organised like a journal or diary. Each entry is dated, and the entries are displayed on the webpage in reverse chronological order, so that the most recent entry is posted at the top. Readers catch up with blogs by starting at the top and reading down until they encounter material they have read. Usually blog is the work of an individual but blogs combining contributions of several people make “group blogs”.

Collaborative Video (Vlog): A video-blog or vlog is simply a blog that uses video as its primary medium in each post and vlogging is the act of publishing video to a blog.

Webcasting: Webcasting is defined as the dissemination of recorded or live content over the Internet

Wiki: Wikis are open, dynamic websites with collaboratively constructed knowledge, information, and resources, which are freely available to any Internet user. Wikis allow users virtually from anywhere to create and contribute to any wiki of their choice. At the same time, wikis enable users of the technology to critically review and collaboratively revise the wiki they use. As a result, users can quickly and frequently update information, fix errors, and constantly extend the knowledge network.

Interactive Whiteboard: It is a large interactive display that connects to a computer and a projector. A projector is used to display a computer’s video output onto the whiteboard, which then acts as a huge touch screen, where users control

the computer using a pen, finger, or other device (SMART technologies, 2006). Interactive whiteboard are usually equipped with four digital writing utensils that use digital ink replacing the traditional whiteboard markers.

Learning Management Systems: In order to provide online courses and programmes on World Wide Web(WWW),we require a software system called Learning Management System(LMS).An LMS is an integrated set of softwares/ programmes that automate the administration ,tracking and reporting of online courses /programmes. It provides a centralized organizational approach to learning for scheduling of courses and registration of learners, and assessment of their learning outcomes. Some of the examples of LMS are Moodle, Black-Board etc.

1.9.4 E-Learning and Traditional Learning

We have learnt that E-learning has wide range of applications in educational field. Traditional classrooms were teacher oriented and presentations were verbal in style. The emergence of online teaching has made learning a learner centered and an active process. The major differences between traditional classroom and online classroom are listed in the Table.1.1.

Table.1.1: Differences between Traditional Classroom and Online Classroom

Traditional Classroom	Online Classroom
<ul style="list-style-type: none"> • It is teacher focused. Teacher is the central component of teaching l-learning process. • Learning is more passive; there are fewer roles for learners in the instructional process. • Teacher concentrates on delivering knowledge and subject content • Instructional strategy is verbal-oriented and is based on traditional methods of teaching • Multimedia may be used, but delivery of instruction is mainly verbal • Student interaction with technology is less • Focus on face-to-face interaction between teacher and learners • Less chance for motivation and self-learning • More use of traditional styles of teaching • Use of technological instruments is less. • Opportunity of interaction between students and teacher is limited • Duration and period of study is fixed • Rigid in character 	<ul style="list-style-type: none"> • It is learner focused. Learner is the central focus of teaching –learning process. • Learning is more active and role of learners is more in the instructional process • Teacher helps in construction of knowledge • Less focus on verbal instruction. Instructional strategies make use of different styles and methods of teaching • Multimedia are used in a variety of ways • Students’ interaction with technology is more • Opportunity of face-to-face interaction between teacher and learners is less • It gives learners chances for self-learning and motivation • Makes use of innovative techniques of instruction • Use of technological instruments is more • Opportunity of interaction between teacher and student is more • Duration and period of study is not fixed • Flexible in nature

Check Your Progress

Notes: a) Write your answers in the space provided.

b) Compare your answers with the one given at the end of the unit.

7) What do you mean by online learning? How is it different from traditional learning?

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8) Select any topic from any subject of your choice and explain the ways of teaching by selecting any one of the approaches of E-learning?

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1.10 INTERNET IN EDUCATION

Internet is one of the innovations of technological era. Internet is a means of connecting a computer to any other computer located anywhere in the world via dedicated routers and servers. When two computers are connected over the Internet, they can send and receive all kinds of information such as text, graphics, voice, video, and computer programs.

The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide. It is a network of networks that consists of millions of private, public, academic, business, and government networks, of local to global, that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support e-mail.

Suppose you are opening Internet with Google software, its home page will appear as shown in Fig: 1.9. There is option to search for WebPages, images, maps, etc. Similarly, you will get option ‘save the page’ you have visited, the website which you have visited more frequently and so on. There are plenty of options in Internet which may be used for your educational purposes.



Fig.1.9: Home Page of Google Search

1.10.1 Advantages of Internet in Education

For the last many years Internet has influenced every walk of human life. This can be observed in the educational sector also. Many educational institutions are using Internet in admission, teaching-learning process, educational evaluation and administration, etc. Some advantages of Internet in education are as follows:

- It is easy to get connected and obtain information.
- It acts as a source of information and a platform to share information.
- It helps to get latest and updated information.
- It is used as a medium for online learning.
- It acts as a multimedia for learning.
- It is a fast medium of communication.
- It provides learners opportunity to work from home and other spaces.

1.10.2 Application of Internet in Education

In the above section, we have discussed about the advantages of Internet in education. Internet has a lot of applications in secondary education. We will focus our discussion on its applications in secondary education. Internet has its applications in the following areas of a school system: 1) student admission, 2) academic evaluation, 3) classroom teaching-learning activities, 4) school administration and management.

Moreover, it is used: 1) as a teaching machine, 2) as a source of information, 3) as a communication tool, 4) as a support to teacher and students., and 5) as an artificial intelligence tool.

To understand the use of Internet in teaching –learning process, a case of a secondary teacher using Internet in teaching-learning process is explained below.

Shyama, a secondary social science teacher assigned students to work on a project titled “types of pollutions”. Students were asked to collect the relevant materials from the web to prepare the project report. Students found the relevant materials from different websites. Some of these were as follows:

- 1) <http://library.thinkquest.org/C0111040/Types/types.php>
- 2) <http://en.wikipedia.org/wiki/Pollution>
- 3) http://greenliving.lovetoknow.com/Types_of_Pollution
- 4) <http://typesofpollution.info/>
- 5) <http://hassam.hubpages.com/hub/Types-And-Causes-Of-Pollution>

So, here students searched Internet to collect information and to complete the assignment. Similarly students can use Internet for other tasks too. If students find difficulty at any stage of learning, they can refer to Internet.

Check Your Progress

- Notes:** a) Write your answers in the space provided.
b) Compare your answers with the one given at the end of the unit.
9) State any four advantages of Internet in education.

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1.11 LET US SUM UP

In this Unit, we explained the concept of Educational Technology. Educational Technology is the result of the integration of the technological devices with the psychological principles of learning and teaching. The differences between Technology in Education and Technology of Education were discussed. Technology in Education is also known as hardware approach to educational technology, whereas Technology of Education is known as software approach to educational technology. We provided a classification of educational technology into eight broad categories on the basis of the senses that are stimulated by educational technologies. We explained meaning of ICT. Communicating information effectively by making use of appropriate technology is called information and communication technology (ICT). A brief introduction to audio mediums like radio, audio CD/DVD, Podcast and audio-visual mediums like television, video CD/DVD was made. Similarly, a brief introduction to computer, its components, and types was also made. The concept of E-learning, its goals, how E-learning caters to the 21st century skills and competencies and communication technologies used in E-learning were discussed. Differences between E-learning and traditional learning were explained. At the end, we explained the concept of Internet, its advantages and disadvantages.

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1.13 ANSWERS TO CHECK YOUR PROGRESS

- 1) Educational technology, in its wide sense can be understood to be including the development, application and evaluation of systemic knowledge about learning and instruction to teaching and training with the aim of improving their quality and efficiency.
- 2) Technology in education is also called the hardware approach to educational technology because it is concerned with the electronic gadgets such as television, radio, language labs and various other projected media, which are being used to educate learners. Technology of education approach to educational technology involves a systematic, scientific application of appropriate scientific research, both from the physical sciences and from the social sciences such as psychology and sociology to solve a problem.
- 3) Information and communication technology consists of three specific terms, **information**, **communication** and **technology**. Communicating information

Understanding ICT

effectively by making use of appropriate technology is called information and communication technology (ICT).

- 4) Radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer and network hardware and software etc. are included under ICT.
- 5) You can make your voice effective medium of communication through modulating your voice; expressing your feelings; emphasis, pause at appropriate places while speaking.
- 6) True or False
 - i) False
 - ii) True
 - iii) False
 - iv) True.
- 7) Online learning is known in various terms such as technology supported learning, computer supported learning, etc. However, it can broadly be defined as the learning supported with the help of Internet technology. For the features of online learning refer to sec 1.9.4.
- 8) Topics like states of matter from science curriculum and Indian Parliament from social science can be taught using project method with the help of Internet. Students may be asked to collect various articles from Internet and group them according to their features. Then it must be named and arranged in Microsoft word software. Finally, they may be asked to display it in classes with physical material in their hand.
- 9)
 - 1) It helps to get latest and updated information.
 - 2) It is used as a medium for online learning.
 - 3) It acts as a multimedia for learning.
 - 4) It is a fast medium of communication.