

UNIT IV

**LESSON NO: 04 INFORMATION AND COMMUNICATION
TECHNOLOGIES – AN INTRODUCTION**

Lesson Structure

- 4.1 Introduction**
 - 4.2 Objectives**
 - 4.3 Background Information**
 - 4.4 Nature and Scope of a communication system**
 - 4.5 Communications Situations**
 - 4.6 Types of communication in classroom**
 - 4.7 Use of ICT in Research**
 - 4.8 Let Us Sum Up**
 - 4.9 Check Your Progress**
 - 4.10 Suggested Readings**
-

4.1 Introduction

Dear students, Information and Communications Technology or (ICT), is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers as well as

necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information. The phrase ICT had been used by academic researchers since the 1980s, but it became popular after it was used in a report to the UK government by Dennis Stevenson in 1997 and in the revised National Curriculum for England, Wales and Northern Ireland in 2000

The integration of Information and Communication Technology is one of the most striking innovations in the field of education. We have to be careful in order to cope up with the suddenly increasing demand for information and technology. The present system of education in India lack the technological touch as the transaction of curriculum is poor or the tools used in the transaction lack application and the skill, we are still dependent on same big blackboards, an overhead projector and video graphed concepts. The information and communication technology in education is in a nascent stage. The general notion of technology in education is reflected in the design, preparation and production of textbooks and other instructional materials for schools. The National Council of Educational Research and Training, New Delhi has taken up major role in this gigantic task.

The presentation and use of teaching aids is the major responsibility of Information and communication technology, at present in the teaching learning process. It is because of ICT the quality of teaching aids in recent times has improved. The variety of teaching aids ranges from a two dimensional chart to a three – dimensional model. Further, the introduction of electronic media has brought a third dimension and movement teaching aids in education. The concept of simulation in the class room deliberations has made it possible to represent the real world happenings without the danger, expense or time needed to experience the actual event. Simulations are highly motivating since there is continual input required of the user, they provide learning experiences that are simply beyond the capability of textbooks besides involving the

learner in the instructional process and thereby permitting learning to be internalized through continuous practice in the life like situation (Hennery and Boysen, 1979).

The information and communication technology has proved to be of immense importance to the distance learners as they can now learn through virtual classrooms and enjoy the teaching learning process at par with the full time regular students. The ICT has helped us in removing all the barriers of time and space. A learner living in any part of the world can pay fee through draft and get asses to any course of interest through e- mail and internet.

4.2 Objectives

Dear students, after reading this lesson, you should be able to:

- What do you understand by the term information and communication technology?
- Discuss the nature and scope of communication system;
- What do you mean by different communication situations;
- What are the different types of communications that occur in the class room;
- What is the contribution of ICT in educational Research?

4.3 Background Information

Information and Communication Technology capability is based on sets of relevant knowledge, skills, behaviours and dispositions. Internationally, such capability is typically represented developmentally across interrelated domains or elements to show increasingly sophisticated experiences with the technology. Early researchers into ICT in education, such as Papert (1980) and Turkle (1984), considered that students constructed reality from experience and prior knowledge. The student interacts with the environment and, to cope with this environment, develops a conceptual framework to explain the interaction. More recent theorists, such as Dede (2009), echo these earlier propositions even as technologies evolve, giving rise to the set of constructs upon which the ICT

capability is based. In particular, the overarching element applying social and ethical protocols and practices when using ICT addresses the personal, social and cultural contexts introduced by theorists such as Papert and Turkle.

ICT capability is based on the assumption that technologies are digital tools that enable the student to solve problems and carry out tasks. That is, the ICT system needs to suit the student and the task, while the student needs to develop an understanding of what the machine can do and an appreciation of the limitations under which it operates. In this way, students come to perceive ICT systems as useful tools rather than feeling that they themselves are the tools of the machine (Maas 1983). The latter often occurs when users have little information about how ICT systems operate and simply follow set, standard procedures, determined for them by the system. Therefore, the ICT capability needs to take account of the types of tasks that provide authentic contexts for learning. The range of tasks is categorized into three sets: Investigating with ICT, Communicating with ICT and Creating with ICT. Students also need the knowledge and skills to use ICT based on an understanding of the 'nature of the machine'. This is encompassed in the Managing and operating ICT element of the continuum.

4.4 Nature and Scope of a communication system

People define terms in different ways, and those differences in definition can have a profound impact on the extent to which we understand each other and the way we move forward with both academic and everyday pursuits. Given the variety of ways in which words are used and understood, we are often ill-served to search for the single, so-called correct definition of a term.

In other words, it is better to evaluate definition in terms of their utility rather than in terms of their correctness. So we should not assume that there is always a single right way

to define a concept. There is a great deal of variation in the definitions. Some are very abstract and some are extremely specific.

Few definitions are cited below.

Communication is the process by which an individual (the communicator) transmits stimuli (usually verbal) to modify the behavior of other individuals (the audience). (Hovland Janis and Kelly in 1953)

Communication is the process by which we understand others and in turn endeavor to be understood by them. It is dynamic, constantly changing and shifting in response to the total situation (Anderson, 1959)

Communication is all of the procedures by which one mind can affect another (W. Weaver, 1949)

Communication means that information is passed from one place to another. (Miller, 1951)

These definitions are incomplete in the sense that Weaver's definition is incredibly broad; it includes all the procedures by which one "mind" could have an effect on another, whereas the other definitions excludes too many activities that we normally think of as communication. However through this definitional turmoil many conceptual features have emerged as important points of discussion

The communication remains ineffective if it does not influence the subject and the object simultaneously. The subject and object, in successful communication, are in a state of independence, that is, where the individuals are merged into a singleness of attitude, away from a stalemate. The communication should proportionately constitute the outflow and the inflow ingredients; the effectiveness of the message is likely to come down to the level of unacceptability. On the other hand, if the inflow outclasses the outflow ingredient, the excessiveness factor may produce intervening variables causing doubtful understanding. The one way flow, replete with uncertainties, may result into misunderstanding, misinterpretation or misconception. Therefore, if the message is not supported by an understanding response or a spontaneous feedback from the

communicate, it can become the cause point for generating upsets, ultimately leading to threatening postures followed by some catastrophe.

Communication is a dynamic process because of its relation with the human variable, relative nature of matter and transformation in language change. The variability, relativity audience may listen or view a speaker or observe a matter differently on different occasions and different places. This is because personal beliefs, behaviour and interests affect perception along with physical properties, such as noise, size of room, atmosphere etc., cause changes to occur within a communication setting.

Communication will be your contact with reality, and really one has no choice but to be a communicator. Man has not only the desire but need to communicate. Man's ability to symbolize, speak and write meaning keeps him at the top of the animal kingdom and enables him to pass knowledge from generation to generation and culture to culture. Man's ability to nomenclate events, things and living beings has enabled him to work on and carry on further research in different fields. Knowledge of communication, thus, is the vital and active force of life. It all depends upon correct and wrong interpretation of knowledge in which humanity has its future.

The process of communication consists of four main components viz.

1. Sender, the source of communication / Message.
2. Message, the contents of the communication.
3. Medium, the channels of communication.
4. Receiver, the respondent of the communication.

1. Sender; the Source of communication (Communicator):

The sender is an individual, group, or organization who initiates the communication. This source is initially responsible for the success of the message. The sender's experiences, attitudes, knowledge, skill, perceptions, and culture influence the message. "The written words, spoken words, and nonverbal language selected are paramount in ensuring the receiver interprets the message as intended by the sender" (Burnett & Dollar,

1989). All communication begins with the sender. In the teaching learning process, the teacher is usually regarded as the sender.

2. Message; the contents of the communication:

What the sender intends to convey in the communication is called the message. The first step the sender is faced with involves the encoding process. In order to convey meaning, the sender must begin encoding, which means translating information into a message in the form of symbols that represent ideas or concepts. This process translates the ideas or concepts into the coded message that will be communicated. The symbols can take on numerous forms such as, languages, words, or gestures. These symbols are used to encode ideas into messages that others can understand. When encoding a message, the sender has to begin by deciding what he/she wants to transmit. This decision by the sender is based on what he/she believes about the receiver's knowledge and assumptions, along with what additional information he/she wants the receiver to have. It is important for the sender to use symbols that are familiar to the intended receiver. A good way for the sender to improve encoding their message is to mentally visualize the communication from the receiver's point of view.

3. Medium; the channels of communication:

To begin transmitting the message, the sender uses some kind of channel (also called a medium). The channel is the means used to convey the message. Most channels are either oral or written, but currently visual channels are becoming more common as technology expands. Common channels include the telephone and a variety of written forms such as memos, letters, and reports. The effectiveness of the various channels fluctuates depending on the characteristics of the communication. For example, when immediate feedback is necessary, oral communication channels are more effective because any uncertainties can be cleared up on the spot. In a situation where the message must be delivered to more than a small group of people, written channels are often more effective. Although in many cases, both oral and written channels should be used because one supplements the other. Usually in the teaching learning process we use both oral and

written channels. If a sender relays a message through an inappropriate channel, its message may not reach the right receivers. That is why senders need to keep in mind that selecting the appropriate channel will greatly assist in the effectiveness of the receiver's understanding. The sender's decision to utilize either an oral or a written channel for communicating a message is influenced by several factors, like type of the message, the condition of the receiver and the response needed for the message.

4. Receiver; the respondent of the communication:

The receiver is the individual or individuals to whom the message is directed. The extent to which this person comprehends the message will depend on a number of factors, which include the following: how much the individual or individuals know about the topic, their receptivity to the message, and the relationship and trust that exists between sender and receiver. All interpretations by the receiver are influenced by their experiences, attitudes, knowledge, skills, perceptions, and culture. It is similar to the sender's relationship with encoding. The receivers in the teaching learning process are usually heterogeneous group of individuals as such the response or feedback mostly depends on the effectiveness of the sender (Teacher) and the message (Content).

Besides the above discussed four basic components of a communication system there are two more components viz. i) Facilitators or Barriers of communication and ii) Response material or Feedback.

I) Facilitators or Barriers of communication:

There are a number of intervening variables between the source of communication and the receiver which either increase or decrease the effectiveness of the communication. These variables according to their nature helping or obstructing the path of communication may be termed as facilitators or barriers of communication. The presence of congenial, physical, psychological, and environmental conditions and facilities available for effective communication may facilitate and help in providing the desirable effectiveness to the communication system while as factors like noise; air

pollution and darkness hinder the path of communication and decrease the effectiveness of the communication.

II) Response material or Feedback:

Feedback is the final link in the chain of the communication process. After receiving a message, the receiver responds in some way and signals that response to the sender. The signal may take the form of a spoken comment, a long sigh, a written message, a smile, or some other action. "Even a lack of response, is in a sense, a form of response" (Bovee & Thill, 1992). Without feedback, the sender cannot confirm that the receiver has interpreted the message correctly. Feedback is a key component in the communication process because it allows the sender to evaluate the effectiveness of the message. Feedback ultimately provides an opportunity for the sender to take corrective action to clarify a misunderstood message.

4.5 Communications Situations:

In the communication process there occur a variety of situations or environments involving two or more than two individuals at one time or the other, these are categorized as under:

One to one communication:

When communication occurs between two individuals only in which one communicates and the other receives the message it is called one to one communication. Most of the communication that took place in our daily lives occurs in this form. The communication between husband and wife, shopkeeper and Customer, any two relatives, friends, lovers, enemies or any two persons is one to one type of communication.

One to many communication:

When communication occurs between more than two individuals in which one communicates and others act as receivers is called one to many communication. This is again common type of communication that occurs in most of the daily life situations.

When a teacher teaches through lecture method and instructs his scholars, a politician addresses a gathering of his supporters, a religious leader speaks to his followers are the instances of one to many communications.

Many to many Communication:

When communication occurs between two groups of individuals in which some individuals communicate the message and some others receive the same such a kind of communication is called many to many communication. This is a typical type of communication which occurs in certain specific situations. For example, the communication that took place in a passenger bus, railway station, class room, social gathering and in a public celebration can be categorized as many to many type of communication.

4.6 Types of communication in classroom

In the formal school system the class room is the important place where teaching learning takes place involving different types of communications. Class room communication is mostly carried out through verbal and non-verbal means. The communication in which we make use of the oral and written language is termed as verbal communication. On the other hand sometimes we use gestures and movements of our body parts to communicate some information without the use of verbal or written language which is termed as non-verbal communication. These two basic types of classroom communication are discussed below:

Verbal Communication:

Every animal species use some sort of sounds to communicate with each other and humans being also use a variety of sounds which in turn form words and sentences that we call language and are used for communication. As we live in societies, every society develops one or more forms of languages with spoken or written words for

communication, as such we have local, regional, national and international languages for the required communication. Language can be used in three different forms-

- I) Oral: In this form one can communicate one's feelings, thoughts and intentions to others by the speaking and listening channel. Here the sender uses some definite sounds (words) with help of his sound system (Mouth) which the receiver decodes with the help of his ears and understands the message and responds.
- II) Written: In this type of communication the communicator / sender makes use of the script of the language such as Devnagari for Hindi, Times roman for English etc. for written communication one uses the paper, pencil/pen and other means with help of hand and writes some message which is then send to the receiver who reads it and understands the information and then responds.
- III) Oral and written: In this type of verbal communication the sender/ communicator first writes some information on the paper or White board and then explains it orally and the receiver first reads the information and then understands properly the message. This is the most common type of communication that occurs in the class room.

Non-verbal communication:

A large amount of communication occurs without the use of verbal communication both in the normal class room as well as in the special classes (class room of deaf, dumb students) A teacher communicates a lot of information through his gestures and body movements and in special classes it becomes a necessity to make use of such gestures and movements to communicate in the class, this is called the non-verbal communication. Some of the important forms of non-verbal communication are discussed as under:

1. Facial Expression:

Facial expression is extensively used for communicating the feelings, thoughts and intentions of the communicator. Facial expressions are considered the true representation

of one's emotional and thinking behaviour. It is through facial expression one can judge the emotional status of mind and one can conclude if one is angry, jealous, astonished, or showing love, sympathy or hatred. In this way it can be considered an effective means of non-verbal communication, extensively used in the class room communication.

2. Expressions of the Eye:

Eyes are most commonly used for conveying a large number of messages by the communicators /Teachers in almost all types of teaching learning environments. The movements of eye like 'Aankhe Dikhana' and 'Aankhe Bichhana' easily provide valid testimonial of its role in communication. Eyes are very well used to communicate emotions of fear, jealousy, anger, enjoyment, hatred, temptation, lust, love, apathy, and sympathy etc. Eye to eye contact is very effective in face to face to conversation. The way one gazes during conversation denotes his liking or disliking for the communicator. In the class room interaction the proper use of eye movements are extremely helpful for teachers to encourage or discourage the process of learning by the students.

3. Body Language:

Different feelings, thoughts and actions can be effectively communicated by the body language of a person. Body language is also used to convey the feelings of love, affection, shyness, happiness and others. Using body language we communicate the feelings of respect, for instance when the teacher enter the class room the students get up as a mark of respect to the teacher, we well come our friends by joining our hands, and say goodbye by shaking our hand. With the effective use of body language the teachers may add colours and effectiveness to their explanations, expositions, and demonstration skills which will then help him to develop healthy class room interaction in almost all types of teaching learning situations.

4. Symbolic code Language:

Special code language can be used for certain desired type of communication, here special code language is prepared with the help of various gestures, postures, body movements and movements of fingers for communicating with deaf and dumb. This can

be very well illustrated be a news bulletin telecasted by Doordurshan specially meant for deaf and dumb population. Various types of well thought and organized code language are very effectively used in exchanging quite meaningful and secret information by the detective and security agencies operating throughout the world.

5. Sound Symbols:

A number of sound signals and vocal cues are used for communication, when the receiver uses some sound like “yah yah” while listening to somebody the speaker gets a notion that the receiver understands the message and he continues to speak with interest and if the receiver uses some other sound symbol like “Na” the communicator also understands that his communication is not effective or liked by the receiver. Sound symbols along with some body language are also used to judge one’s emotional feelings for instance when one is happy he makes certain sounds which clearly denotes his happiness and if otherwise he usually remains silent.

4.7 Use of ICT in Research

For many people, use of ICT has not progressed beyond word-processing, using email and web browsing. The wider implications for new practices and research methods need to be recognized. Information and communication technology is extremely beneficial for the students desirous to undertake research in the field of education. ICT is the well organized source of information which can provide quite diversified, pinpointed, and reliable information to the researchers at their doorsteps without the expense of time and energy. The channels of communication are open for every researcher and they can use them at their will for carrying out their research activities.

ICT may prove quite useful in helping all personnel connected directly or indirectly with the processes and products of education. Information and communication are keys of knowledge and learning and then proper and scientific organization and control is bound to lead towards the effective educational effort for the proper realization

of educational goals. Information and Communications Technology plays a vital and growing role in research. In its simplest form it is used to gather, collate and disseminate information from advertising funding opportunities through to publishing conclusions. A number of programmes has been launched in this regard and some of these programmes have a broad range of objectives which act as a framework and guide for the types of funding opportunities available under the programme.

- To develop a focused and integrated portfolio of projects, workshops and dissemination events complementing the activities already funded by the AHRC and other national bodies.
- To enhance research capacity in the arts and humanities by developing innovative resources, tools, standards and training materials that will be used in the conduct and dissemination of research, and in the preservation of and access to research materials.
- To enhance the contribution that the arts and humanities community is able to make to discussions on ICT issues that impact across all research disciplines.
- To create new research outputs that are valuable in themselves, arising from projects that demonstrate the extension and enhancement of ICT applications in arts and humanities research.
- Where appropriate, to facilitate and develop co-ordination and communication with the AHRC on ICT matters.
- To initiate and develop projects and strategic partnerships with other bodies for the development and use of ICT resources and tools for arts and humanities research.
- To provide a focal point for outreach to stakeholders beyond academia.
- To develop international collaboration where appropriate and to disseminate findings to an international audience.

The ICT has almost revolutionized every field of Knowledge and the field of research has also witnessed a sea change. The internet and world wide web has made the job of research more reliable and valid not only at the local level but globally as well, today we can download any sort of information from the internet and can use that any where any time without the expenditure of time and resources. Following are some fields of ICT where we can get benefit for our educational needs.

Telecollaboration:

The organized use of Web resources and collaboration tools for curriculum appropriate purposes is called telecollaboration. Judi Harris defines telecollaboration as “an educational endeavor that involves people in different locations using Internet tools and resources to work together. Much educational telecollaboration is curriculum-based, teacher-designed, and teacher-coordinated. Most use e-mail to help participants communicate with each other. Many telecollaborative activities and projects have Web sites to support them.” The best telecollaborative projects are those that are fully integrated into the curriculum and not just extra-curricular activities, those in which technology use enables activities that would not have been possible without it, and those that empower students to become active, collaborative, creative, integrative, and evaluative learner. There are currently hundreds of telecollaborative projects being implemented worldwide and many more that have either been completed or are in development.

Writing a Bibliography: APA Format:

While writing a bibliography, your list of works cited should begin at the end of the paper on a new page with the centered title, *References*. Alphabetize the entries in your list by the author's last name, using the letter-by-letter system (ignore spaces and other punctuation.) Only the initials of the first and middle names are given. If the author's name is unknown, alphabetize by the title, ignoring any *A*, *An*, or *The*.

For dates, spell out the names of months in the text of your paper, but abbreviate them in the list of works cited, except for May, June, and July. Use either the day-month-year style (22 July 1999) or the month-day-year style (July 22, 1999) and be consistent. With the month-day-year style, be sure to add a comma after the year unless another punctuation mark goes there.

Underlining or *Italics*

When reports were written on typewriters, the names of publications were underlined because most typewriters had no way to print italics. If you write a bibliography by hand, you should still underline the names of publications. But, if you use a computer, then publication names should be in italics as they are below. Always check with your instructor regarding their preference of using italics or underlining. Our examples use italics.

Hanging Indentation

All APA citations should use hanging indents, that is, the first line of an entry should be flush left, and the second and subsequent lines should be indented 1/2".

Capitalization, Abbreviation, and Punctuation

The APA guidelines specify using sentence-style capitalization for the titles of books or articles, so you should capitalize only the first word of a title and subtitle. The exceptions to this rule would be periodical titles and proper names in a title which should still be capitalized. The periodical title is run in title case, and is followed by the volume number which, with the title, is also italicized. If there is more than one author, use an ampersand (&) before the name of the last author. If there are more than six authors, list only the first one and use *et al.* for the rest.

Place the date of publication in parentheses immediately after the name of the author. Place a period after the closing parenthesis. Do not italicize, underline, or put quotes around the titles of shorter works within longer works.

4.8 Let Us Sum Up

Information and communication technology refers to the technology employed in the form of tools, equipment and application support which helps in the collection, storage, retrieval, use, transmission, manipulation and dissemination of information as accurately and effectively as possible for the purpose of enriching the knowledge and develop communication, decision-making as well as problem solving ability of the user. Information and communication technology got new impetus through the inventions related to Photography; Photostat technique, Xerox, laser technology, and Magnetic video camera, Videodisc and Computers. Besides this, the advancement made in the field of telecommunication technology in the shape of inventions of telegraph, telephone, radio, television and communication satellites, cables fax, etc. has contributed a lot in the evolution of ICT in the present age. With the passage of time the ICT expanded its wings in every field of education and now today we may witness its wide use in all fields and walks of life including education and instruction.

Information and communication technology has made us familiar with latest technologies like digital video cameras, multimedia, personal computer (PC), laptop, notebook, palmtop, multimedia projector (LCD or DLP), computer networking, internet and world wide websites, computer mediated video and audio conferencing, video text, tele text, virtual classroom, virtual reality etc. The use of Information and communication technology is playing vital role in the field of education in so many ways. It is providing immense help and assistance to all connected with the task of education like students, teachers, guidance and counseling personnel's, educational planners and research workers for performing their responsibilities as adequately as possible. Besides this it is also performing a great role in bringing desired changes and revolution in the whole system of formal and non-formal education and instruction.

4.9 Check Your Progress

1. Discuss the Nature and Scope of a communication system.
 2. What do you understand by different communication situations?
 3. What are the different types of communications that occur in the classroom?
 4. Discuss the uses of ICT in Research, including on line research?
 5. What are uses of internet and other sources of ICT in Educational Publications?
-

4.10 Suggested Readings

Alexis Leon and Mathews Leon (1999), Fundamentals of Information Technology, Leon Tech world, Vikas publishing House Pvt. Ltd.

Anand, S., University without Walls: Correspondence Education in India, New Delhi: Vikas Publications, 1979.

Arulsamy, S. and Sivakumar, P., Application of ICT in Education, Neelkamal Publications Pvr. Ltd. Hyderabad, A P.

Brian K. Williams, et al. (1999), Using Information Technology- A practical introduction to computers and communication (Third edition) Tata McGraw Hill Publishing Company limited New Delhi.

Heim, Michael (1993), The Metaphysics of Virtual Reality, New York, NY: oxford University press.

Mangal, S. K. and Mangal Uma, Essentials of Educational Technology, PHI Learning Private Limited, New Delhi.

Singh, Bakhshish (Ed.), New Horizons in Distance Education, New Delhi, Uppal Publishing House. 1995.

Usha V. Reddya and Saujaya Mishra. (2003) Educational Multimedia- A hand Book for Teacher- Developers, CEMCA, New Delhi.
