

Role of information and communication technology in education

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Abstract

This paper highlighted the meaning and various features of information and communication technology , it also emphasized the role of ICT in education. This paper also throws the light on the importance of ICT and how ICT plays vital role in solving the various problems of educational set up. Information and communication technology helps the teacher educator as well as the students to keep pace with these technologies. It is very useful in the classroom because it provides the information about the various websites and other related resources from which the students as well as teacher educators will get knowledge and will take the benefits of innovations and other related materials in the form of e- journals, e- books , important website links , digital libraries and other material to enhance their teaching and makes the teaching more effective and purposeful learning.

INTRODUCTION

ICT stands for information and communication technology and is refers to teaching and learning the subject matter that enables understanding the functions and effective use of information and communication technologies (ICTs). Information-communication technologies (ICT) are a part of our world and we use them every day. They represent an important source of information about us and others, as well as about local and world events. Besides that, ICT can also be very attractive for school children, who acquaint with them very quickly.

COMPONENTS OF ICT

- Information
- Communication
- Technology

Information: Information is a basic unit of communication and can come in several forms: words, numbers, images, and sounds as shown in Figure :

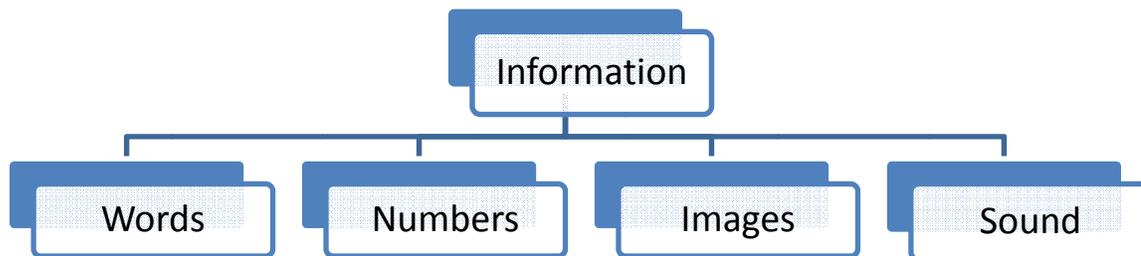


Figure :The Basic Forms of Information

- **Words.** Words carry information, whether they are conveyed in spoken (e.g., lecture, conversation) or in printed form.
- **Numbers.** Numbers and data were clearly the second most common carriers of information in the last half-century. Computers, from their earliest days, have been efficient at storing, manipulating, and eventually sending and receiving many kinds of quantitative information, i.e., "numbers."
- **Images.** Now the story starts to get a little more complex and interesting. Images come in at least three distinct forms: still pictures, video, and graphics (e.g., art). Only in the last few years have computers become efficient (re: widely available at a low price) enough to send images easily. But now teachers and students can easily send and receive still photographs, moving video sequences, and high quality art work. This is the kind of information that many teachers find is being used more frequently, relative to words and numbers. People in the computer age respond easily and enthusiastically to images, and they like to communicate their ideas in the form of images, rather than just words or numbers.
- **Sounds.** This form of information is still not yet widely used on computers, but the potential is there. It is not word-based but it is a sound with its own information and meaning. For example recordings of bird songs.

IMPORTANCE OF ICT

- **No geographical barriers.** The students and teachers can join collaborative projects that involve students from different geographical areas. Without ICT it is not possible to share knowledge between people from different states, countries or continents. The Internet promotes fast communication across geographical barriers. This is a unique learning experience very essential for each of our students, as the world is becoming one big community.
- **Cost effectiveness** – ICT provides cost effective methods for teaching and learning. Any teacher and learning can access Internet at a very low cost. Information is freely available to any and all with an internet connection.
- **Access to remote learning resources.** ICT provides access to remote learning resources. Teachers and students no longer have to rely solely on printed books and other materials in physical media housed in libraries for their educational needs. This is particularly significant for many schools in developing countries,

and even some in developed countries, that have limited and outdated library resources. ICTs also facilitate access to resource persons, mentors, experts, researchers, professionals, business leaders, and peers—all over the world.

- ***Anywhere, anytime access.*** With the Internet and the World Wide Web, a wealth of learning materials in almost every subject and in a variety of media can now be accessed from anywhere at anytime of the day and by an unlimited number of people. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. The most important feature of ICTs is their ability to transcend time and space. ICTs make possible asynchronous learning, or learning characterized by a time lag between the delivery of instruction and its reception by learners. ICT-based educational delivery (e.g., educational programming broadcast over radio or television) also dispenses with the need for all learners and the instructor to be in one physical location. Additionally, certain types of ICTs, such as teleconferencing technologies, enable instruction to be received simultaneously by multiple, geographically dispersed learners (i.e., synchronous learning).
- ***Motivating Factor.*** The Internet can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest, excitement, and enthusiasm about the Internet for the purpose of enhancing learning. For already enthusiastic learners, the Internet allows you to provide them with additional learning activities not readily available in the classroom
- ***Useful in Teaching:*** Through ICT, we can use images in teaching and improving the retentive memory of students. Teachers can easily explain complex instructions and ensure students' comprehension. Teachers are able to create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration.
- ***Cooperative Learning:*** The Internet facilitates cooperative learning, encourages dialogue, and creates a more engaging classroom. For example, a teacher will allow your students to get involved in class discussions through e-mails in a way not possible within the four walls of the classroom.
- ***Locating Research Materials:*** Apart from communication, research is what takes many people to the Internet. There are many more resources on the Internet than the school library can provide. We can encourage students to take advantage of this wealth of resources on the Internet for their research.
- ***Acquiring Varied Writing Skills:*** If students are required to publish their work on the Internet, they have to develop hypertext skills. These skills help students gain experience in non-sequential writings. Moreover, and since the Internet is open to all with access, students publishing their work on the Internet are forced to be mindful of their language and to write to non-expert audience.

ICT TOOLS

- **Interactive Whiteboard**

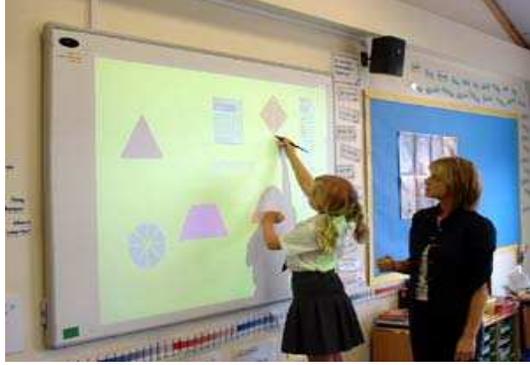


Figure Interactive Whiteboard

An Interactive whiteboard is a large touch-sensitive display board that connects to a computer. The board is typically mounted to a wall or floor stand. It is mainly used for teaching in the classroom. It is an instructional tool that allows computer images to be displayed onto a board using a digital projector. The teacher can manipulate the elements on the board by using his finger as a mouse, directly on the screen. It is a powerful tool used in the classroom which allows the integration of media content into the lecture and supporting collaborative learning. It captures and save handwritten notes written on a whiteboard to the connected PC. It can run software that is loaded onto the connected PC such as web browser or other software used in the classroom. Interactive whiteboard is now commonplace in almost every educational institution. The main features of Interactive whiteboard are:

- Add annotations
 - Highlight Text
 - Add and save notes
 - Helpful to teach a large number of students
 - Using Optical Mark Reader (OCR) software to translate handwriting on a graphics tablet into text.
- **Over head Projector**



Figure Overhead Projector

Overhead projector capable of projecting enlarged images of written or pictorial material onto a screen or wall from a transparency placed horizontally below the projector and lighted from underneath. It typically consists of a large box containing a very bright lamp

and a fan to cool it. Above the box, typically on a long arm, is a mirror and lens that focusses and redirects the light forward instead of up. Transparencs are used to produce pictures or textual information which are placed on top of the lens for display. The light from the lamp travels through the transparency and into the mirror where it is shone forward onto a [screen](#) for display. The height of the mirror can be adjusted, to both focus the image and to make the image larger or smaller depending on how close the projector is to the screen.

- **Computer**



A **computer** is an electronic device that manipulates information, or "data." It has the ability to **store**, **retrieve**, and **process** data. You can use a computer to type documents, send email, and browse the internet. All types of computers consist of two basic parts:

Hardware is any part of your computer that has a **physical structure**, such as the computer monitor or keyboard.

Software is any **set of instructions** that tells the hardware what to do. It is what guides the hardware and tells it how to accomplish each task. Some examples of software are web browsers, games, and word processors such as Microsoft Word.

ROLE OF INFORMATION TECHNOLOGY IN EDUCATION

ICT has opened new avenues, like, Online learning, e-learning, Virtual University, e-coaching, e-education, e-journal, etc. Third Generation Mobiles are also part of ICT. Mobile is being used in imparting information fast and cost effective. It provides e-mail facility also. One can access it anywhere. It will be cost effective. The ICT brings more rich material in the classrooms and libraries for the teachers and students. It has provided opportunity for the learner to use maximum senses to get the information. It has broken the monotony and provided variety in the teaching – learning situation. Teaching at School as well as Higher Education, mostly, concentrates on giving information which is not the sole objective of Teaching. The main objectives of ICT are:

- To develop understanding and application of the concepts
- To develop self-concept and value clarification
- To develop reasoning and thinking power
- To develop of judgment and decision making ability
- To develop expression power
- To develop proper study habits

- To improve comprehension, speed and vocabulary

With the present infrastructure, class size, availability of teachers, quality of teachers, training of teachers, etc., it is difficult to achieve all the objectives. Lecture Method is used by most of the teachers which does not have potentiality of achieving majority of above mentioned objectives. Multiple methods should be used in an integrated fashion to achieve the objectives. A single teacher does not capable of giving up to date and complete information in his own subject. The ICT can fill this gap because it can provide access to different sources of information. It will provide correct information as comprehensive as possible in different formats with different examples. ICT provides Online interaction facility. Students and teachers can exchange their ideas and views, and get clarification on any topic from different experts, practitioners, etc. It helps learners to broaden the information base. ICT provides variety in the presentation of content which helps learners in concentration, better understanding, and long retention of information which is not possible otherwise. The learners can get opportunity to work on any live project with learners and experts from other countries. The super highway and cyber space also help in qualitative improvement of Teaching – Learning Process. ICT provides flexibility to learners which is denied by the traditional process and method. Flexibility is a must for mastery learning and quality learning.

The following are some of the role of information and communication technology in education :

Useful for the teachers : ICT is very helpful for the teacher educators . with the help of ICT teachers achieve the objectives of his teaching. With the help of ICT the teacher use the knowledge of different journals, e books and other related materials to enhance his teaching in the classroom.

Useful for the students : ICT helps the students for self improvement and helps him to satisfy his curiosity and their need to find the new.

Useful for Educational administrators and planners: ICT helps the educational administrators and planners to successfully fulfil their professional liabilities . through it they get information about recent developments in the field of education administration and planning.

Helpful to make different assignments: ICT helps the students in the prepration of assisgments . students get knowledge from the different journals as well as other websites to make quality assisgments and broaden their knowledge .

Useful for the research scholars: ICT also helps the students of M.Ed. in the preparation of dissertation writing. it helps in the search of topic of their interest and also helps to set the hypothesis and objectives in the light of the review of related studies.

Create a learning community – social constructivism

- Providing opportunities for peer learning and mentoring
- Providing continuous support beyond workshops to teachers to address issues from

practice as well as receive feedback and learning from experiences.

- Space for individual and collective reflection

Move teachers to co-constructors of learning

- Individual need based
- Self directed / self paced
- Peer support and sharing/learning
- Co-creation of learning resources on a large scale and contextual.

Benefits of ICT in Teacher Education

General benefits

- Greater efficiency .
- Communication channels are increased through email, discussion groups and chat rooms
- Regular use of ICT across different curriculum subjects can have a beneficial motivational

influence on the students

Benefits for teacher educators

- ICT facilitates sharing of resources, expertise and advice
- Greater flexibility in when and where tasks are carried out
- Gains in ICT literacy skills, confidence and enthusiasm
- Easier planning and preparation of lessons and designing materials
- Access to up-to-date pupil and school data, any time and anywhere.
- Enhancement of professional image projected to colleagues
- Students are generally more ‘on task’ and express more positive feelings when they use computers than when they are given other tasks to do.
- Computer use during lessons motivated students to continue using learning outside school hour.

Benefits for students

- Higher quality lessons through greater collaboration between teachers in planning and

preparing resources.

- More focused teaching, tailored to students' strengths and weaknesses, through better analysis of attainment data
- Improved pastoral care and behaviour management through better tracking of students
- Gains in understanding and analytical skills, including improvements in reading Comprehension.
- Development of writing skills (including spelling, grammar, punctuation, editing and re- drafting), also fluency, originality and elaboration .
- Encouragement of independent and active learning, and self-responsibility for learning.
- Flexibility of 'anytime, anywhere' access.
- Development of higher level learning styles.
- Students who used educational technology felt more successful , were more motivated to learn and have increased self-confidence and self-esteem.
- Students found learning in a technology-enhanced setting more stimulating and student- centred.
- Broadband technology supports the reliable and uninterrupted downloading of web-hosted educational multimedia resources
- Opportunities to address their work to an external audience.

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