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Cluster University of Jammu

**COURSE: 7ITETC0105COURSE TITLE: ICT IN EDUCATION
UNIT: FIRST**

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UNIT FIRST

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CONCEPT OF DATA & INFORMATION IN ICT

DATA: Think of data as a "raw material" - it needs to be processed before it can be turned into something useful. Hence the need for "data processing". Data comes in many forms - numbers, words, symbols. Data relates to transactions, events and facts. On its own - it is not very useful.

Data can be defined as a representation of facts, concepts, or instructions in a formalized manner, which should be suitable for communication, interpretation, or processing by human or electronic machine.

Data is represented with the help of characters such as alphabets (A-Z, a-z), digits (0-9) or special characters (+, -, /, *, <, >, = etc.)

INFORMATION:- Information is organized or classified data, which has some meaningful values for the receiver.

Information is the processed data on which decisions and actions are based.

For the decision to be meaningful, the processed data must qualify for the following characteristics –

- **Timely** – Information should be available when required.
- **Accuracy** – Information should be accurate.
- **Completeness** – Information should be complete.

Basically, information is the message that is being conveyed, whereas data are plain facts. Once the data is processed, organized, structured or presented in a given context, it can become useful. Then data will become information, knowledge.

Some Differences Between Data And Information:

- Data is used as input for the computer system. Information is the output of data.
- Data is unprocessed facts figures. Information is processed data.
- Data doesn't depend on Information. Information depends on data.
- Data is not specific. Information is specific.
- Data is a single unit. A group of data which carries news and meaning is called Information.
- Data doesn't carry a meaning. Information must carry a logical meaning.
- Data is the raw material. Information is the product.

Comparison Between Data And Information:

	Data	Information
Definition (Oxford Dictionaries)	Facts and statistics collected together for reference or analysis	Facts provided or learned about something or someone Data as processed, stored, or transmitted by a computer
Refers to	Raw Data	Analyzed Data
Description	Qualitative Or Quantitative Variables that can be used to make ideas or conclusions	A group of data which carries news and meaning
In the form of	Numbers, letters, or a set of characters.	Ideas and inferences
Collected via	Measurements, experiments, etc.	Linking data and making inferences
Represented in	A structure, such as tabular data, data tree, a data graph, etc.	Language, ideas, and thoughts based on the data
Analysis	Not analyzed	Always analyzed
Meaning	Carries no specific meaning	Carries meaning that has been assigned by interpreting data
Interrelation	Information that is collected	Data that has been processed

DEFINITION OF ICT

Stands for "Information and Communication Technologies." ICT refers to technologies that provide access to information through **telecommunications**. It is similar to **Information Technology (IT)**, but focuses primarily on communication technologies. This includes the **Internet**, wireless networks, cell phones, and other communication mediums.

In the past few decades, information and communication technologies have provided society with a vast array of new communication capabilities. For example, people can communicate in **real-time** with others in different countries using technologies such as **instant messaging**, voice over IP (**VoIP**), and video-conferencing. **Social networking** websites like **Facebook** allow users from all over the world to remain in contact and communicate on a regular basis.

Modern information and communication technologies have created a "global village," in which people can communicate with others across the world as if they were living next door. For this reason, ICT is often studied in the context of how modern communication technologies affect society.

Another way of looking at it is that ICT stands for:

1. **Information – (or data) in paper or electronic format**
2. **Communication – in person or electronically (electronic communications), in writing or voice, telecommunications, and broadcasting**
3. **Information technology (IT) – including software, hardware and electronics**
4. **Communications technology – including protocols, software and hardware**

ICT is technology that supports activities involving information. Such activities include gathering, processing, storing and presenting data. Increasingly these activities also involve collaboration and communication.

Hence IT has become ICT: information and communication technology.

Some underlying principles:

Technology does not exist in isolation

- ICT contributes at various points along a line of activity
- ICT is used in activities – the ICT use depends on the activities
- The key outputs of educational activities are context are knowledge, experience and products
- The output should be useful to the users (self and others)
-

What is a useful concept of ICT? It depends on the local culture and the particular ICT available and how it is configured and managed. The understanding, management and configuration of the available technology might vary the concept of ICT from a collection of tools and devices used for particular tasks, eg, publishing, course delivery, transaction processing... an organised set of equipment (like a 'workshop') for working on information and communication components of integrated arrangements of devices, tools, services and practices that enable information to be collected, processed, stored and shared with others components in a comprehensive system of people, information and devices that enables learning, problem solving and higher order collaborative thinking, that is, ICT as key elements underpinning a (sharable) workspace.

Lets focus on the three words behind

ICT: -INFORMATION -COMMUNICATIONS -TECHNOLOGY A good way to think about ICT is to consider all the uses of digital technology that already exist to help individuals, businesses and organisations use information. ICT covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. For example, personal computers, digital television, email, robots. Information and communication technology (ICT)

Information and communication technology, or ICT, is defined as the combination of informatics technology with other, related technologies, specifically communication technology.

POTENTIAL OF ICT'S

ICTs play an important role in forms of traditional learning. ICTs can enhance traditional teaching of subjects as sources of teaching materials or through the use of multimedia presentations to deliver lectures and classes. Many implementations of ICTs in education focus on equipping both students and teachers with basic IT skills, learning how to use word processors, develop spreadsheets and reply to emails. These skills are vital for individuals to access opportunities in both employment and further education as a number of developing countries integrate ICTs into their wider economic activity. Focusing solely on delivering these basic IT skills or enhancing existing teaching however fails to fulfil the transformational potential ICTs have in shifting the focus of education away from teacher-centred lecture-based instruction to student-centred interactive learning.

ICTs can transform education from teacher-centred, lecture-based instruction to student-centred, interactive learning environments. There is the potential to transform education and the relationship between students and teachers in a number of ways. By placing students at the centre, ICTs can be used to help individuals discover knowledge through the internet or other multimedia resources. Creating presentations together than enhance collaboration and peer support. Developing and following their own learning strategy can help individuals overcome the particular challenges they face. Material and subjects presented through multimedia and interactive ICTs have also proven to keep students engaged and focused for longer. ICTs can also provide extensive opportunities for the teacher learner relationship to be reversed. Students can become teachers through peer tutoring and reciprocal mentoring, increasing self-esteem, motivation and student engagement. Teachers must be supported to engage with such strategies and not feel ashamed to be taught by young learners or feel concern that they may 'lose control' of their classrooms. These potential benefits are particularly appropriate for developing country contexts where schools and teachers often lack resources and deal with large class sizes.

The potential is significant, however such pedagogical integration of ICTs is rarely observed. Key to facilitating this transformation is understanding the current levels of technical and training support provided to teachers, and to identify the level and types of support needed. Learning how to use operating systems, word processors and spreadsheets will enhance existing teaching. Whilst basic ICTs knowledge and skills is a vital first step for teachers and students alike, success will be limited without further training and support for teachers to integrate ICTs in ways which transform their approach to teaching. To achieve this, specific training must aim to introduce teachers to the range of ways in which ICTs can be used to transform education in the way discussed.

I believe this transformation of education driven by ICTs is key to overcoming many of the challenges faced in communities and schools in developing countries. Looking ahead, I will soon be visiting partners to understand how our current work is achieving this transformation, and to better identify the barriers which sometimes prevent this from happening. I hope these visits will inform my future work and direction when building projects and relationships with our partners across the world.

RECENT TRENDS IN ICT

Within Information and Communication Technologies, there are many current trends. These may include:

- Use of interactive learning
- Online banking
- Online shopping, advertising and selling
- Networking
- Gaming
- Communicating
- Learning
- Entertainment
- Sharing and Displaying

On devices such as:

- Interactive whiteboards
- Computer software including mindmapping tools (inspiration) and visualisation software (google earth). As well as this – internet which allows for all ICT current trends such as networking (blogs, email).
- Mobile phones (calling and texting)
- Smart phones (video, internet, email, calling, texting, camera)
- Gaming consoles (playstation, gameboy, wii)
- Digital and video cameras with printers or display units such as digital photo frames
- Televisions
- ipods and ipads
- Digital keyboards, drawing tablets
- Usbs
- Learning objects (please view the example below)
- **Science (universe) Learning Object**

This is because:

- ICTs enhance active and collaborative learning
- ICTs are learning and teaching tools
- ICTs can allow us to produce effective text and screen-based materials
- ICTs can allow us to access and use the Internet as a research tool
- ICTs can allow for understanding of the diversity of students' learning styles and the principles of higher order learning
- ICTs can create simple web-based teaching resources
- ICTs are affordable, online (accessible) and easy to learn with.

Some new views of learning which incorporate ICT include:

- learning with computers
- knowledge construction instead of consumption
- social processes of learning

SCOPE OF ICT IN EDUCATION

The scope of ICT in Education are ICT encompasses all those gadgets that deal with the processing of information for better and effective communication. In education, communication process takes place between teachers, students, management and administrative personnel which requires plenty of data to be stored for retrieval as and when required, to be disseminated or transmitted in the desired format. The hardware and software like OHP, Television, Radio, Computers and related software are used in the educational process. However ICT today is mostly focused on the use of Computer technology for processing the data.

In this context, advantages of ICT in education can be listed down as follows :

- **Quick access to information** : Information can be accessed in seconds by connecting to the internet and surfing through Web pages.
- **Easy availability of updated data**: Sitting at home or at any comfortable place the desired information can be accessed easily. This helps the students to learn the updated content. Teachers too can keep themselves abreast of the latest teaching learning strategies and related technologies.
- **Connecting Geographically dispersed regions**: With the advancement of ICT, education does not remain restricted within four walls of the educational institutions. Students from different parts of the world can learn together by using online, offline resources. This would result in the enriching learning experience. Such collaborative learning can result in developing...
 - divergent thinking ability in students,
 - Global perspectives
 - respect for varied nature of human life and acculturation.
 - Facilitation of learning

ICT has contributed in shifting the focus on learning than teaching. ICT helps students to explore knowledge to learn the content through self study. Teacher can help the students by ensuring the right direction towards effective learning. Situational learning, Programmed learning, many Online learning courses are some of the example of self learning strategies that are being utilized with the help of ICT.

- **Catering to the Individual differences**: ICT can contribute in catering to individual needs of the students as per their capabilities and interest. Crowded class rooms have always been a challenge for the teacher to consider the needs of every student in the class.
- **Wider range of communication media**: With the advent of ICT, different means of communication are being introduced in the teaching learning process. Offline learning, on line learning, blended learning are some of the resources that can be used in educational institutions. Collaborative learning, individualized learning strategies can enhance the quality of group as well as individual learning. with the real society. This can ensure the applicability of knowledge.
- **Wider learning opportunities for pupils** Application of latest ICT in education has provided many options to the learners to opt for the course of their choices. Many Online courses are available for them to select any as per their aptitude and interest. Students can evaluate their own progress through different quizzes, ready to use Online tests. This can ensure fulfillment of the employment required in the job market thus minimizing the problem of unemployment. It can also provide more efficient and effective citizens to the society as per the changing needs.

ICT USING TECHNOLOGY TO ENHANCE LEARNING

Using ICT to enhance learning

ICT capability is about having the technical and cognitive proficiency to access appropriately, to use, develop, create and communicate information using technological tools. Learners demonstrate this capability by purposefully applying technology to solve problems, analyse and exchange information, develop ideas, create models and control devices. They are discriminating in their use of information and ICT tools and systematic in reviewing and evaluating the contribution ICT can make to their work as it progresses.

ICT capability is much broader than a set of technical competences in software applications although, clearly, these are important. ICT capability involves the appropriate selection, use and evaluation of ICT. In essence, students need to know what aspects of ICT are available to them, when to use it and why it is appropriate for the task.

For example, when creating a presentation, ICT capability involves the selection of appropriate software, consideration of fitness for purpose and matching content and style to a given audience. It is important that lessons are not software – or technology – driven but focused on clear teaching and learning objectives where ICT is used as a vehicle to support achievement of those objectives.

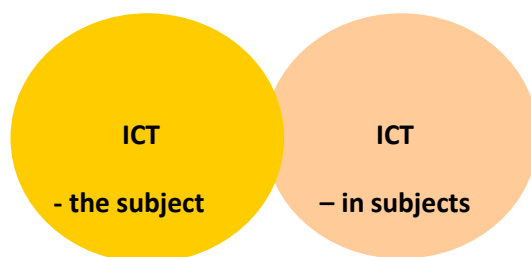
How does ICT support teaching and learning?

Students' ability to apply their ICT capability across the curriculum is largely dependent on the effective teaching and learning of ICT in the first place. Students' use of ICT in other subjects may be ineffective if they do not already have an appropriate level and understanding of ICT capability. This may result in a lack of progress in both ICT and the subject area. For example, asking students to produce a presentation in a given subject will be unproductive if they have little experience of using the software or understanding of how to create meaning and impact for a given audience. Students who try to learn new areas of ICT at the same time as new subject content will often fail in both endeavours.

It is crucial that students are taught the appropriate ICT capability before applying it in other subjects. The relationship between 'ICT – the subject' and 'ICT – in subjects' can therefore be viewed as interactive and mutually supportive, as shown in the diagram below.

ICT capability

Applying and develop ICT capability



Purposeful and appropriate application of ICT in subjects offers students opportunities to:

- Use their ICT capability to assist and progress their learning in subjects;
- Engage in higher-order thinking skills, for example by using ICT to undertake detailed analysis when modelling data;

- Demonstrate, apply and reinforce their understanding of ICT capability within a range of subject contexts. The transferability of ICT capability is an important aspect of progression in students' knowledge, skills and understanding.

It is important to recognise that students using ICT effectively in subjects may not always be applying high levels of ICT capability. For example, using a word-processor to draft and re-draft text is a valid and powerful activity in a range of subjects; using software to support learning in MFL or using a learning support program in mathematics or a bespoke program designed to aid learning in science can be significant in helping students make progress. In all such cases, ICT fulfils a legitimate function if using it moves learning in the subject forward, but it may make little contribution to developing the ICT capability taught in ICT lessons.

As students become more confident and proficient in using ICT, there will be opportunities to apply and develop higher ICT capability in subjects, for example producing web pages for a given purpose and audience, manipulating data to prove in the subject.

a hypothesis, or incorporating sound and video into a presentation to add meaning and impact. It is important to reiterate that, whatever the level of ICT capability applied, it must add value to the teaching and learning

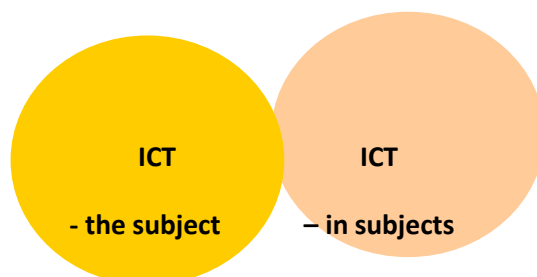
So far we have reviewed the use of ICT as a learning tool for students and have acknowledged how students who are confident and proficient in ICT can bring with them opportunities for extending their learning as they use their ICT in other subjects in the school curriculum.

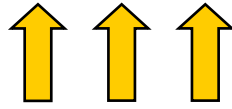
However, existing and emerging ICT *teaching* tools provide further opportunities to enhance subjects and add value to teaching and learning. For example, the use of interactive whiteboards, video projection units, microscopes connected to computers, prepared spreadsheets to capture and model data, CD-ROMs, presentations with video and carefully selected resources from the internet all provide examples of how ICT can be embedded into subject teaching.

The diagram showing ICT across the curriculum can therefore be extended to include ICT as a tool or medium for teaching. Clearly, elements of the model will overlap and impinge on each other. When thinking about how ICT enhances teaching and learning, the challenge is to make the most purposeful use of the available resources across all teaching and learning. Opportunities to embed ICT in subject teaching need to be exploited, as appropriate.

ICT capability

Applying and develop ICT capability





ICT – a tool for teaching
(the medium)

Your use of ICT may involve little or no use of ICT by students and, consequently, may do little to apply and develop their ICT capability. However, use of ICT as a medium of teaching can enhance and stimulate the learning experiences of students and contribute to the achievement of subject objectives. It is important to recognise the different contributions that ICT can make to teaching and learning and to acknowledge the importance of each.

Changing learning behaviours

Behaviourists claim that learning changes behaviour when learners respond to teaching by exhibiting similar responses to the same, or similar, teaching stimuli. In ICT this would be seen as the use of models of programmed learning, where students use software to redress deficiencies in basic skills (usually in literacy and numeracy) or the use of drill and practice approaches to teaching.

Keyboarding is a prime example of the drill and practice approach, where students spend time learning which fingers to use for which keys on the keyboard so that, eventually, they can type, using all their fingers appropriately, without looking at the keyboard. Some would argue that this makes working with the major input method much more efficient and that the time spent going over basic skills until proficiency is gained establishes rein-forcers that will serve us well in the future, rather like the notions that apply to 'riding a bike'.

This has often been referred to as 'operant conditioning' and can be seen as an important aspect of learning reinforcement. Behaviourism grew therefore from a belief that positive and negative reinforcement with punishment appropriately applied would, when arranged effectively, cause students to learn. The teachers' role in this was to organise the rein-forcers and to develop appropriate directed teaching sessions to support the learners as they progressed.

Many of the skills-based approaches to teaching with ICT follow a behaviourist model, directing the learning step by step, prompting students with praise and passwords (positive reinforcement) when they have completed tasks effectively, or focusing on the requirement to follow instructions exactly and making keystrokes accurate when working in order to pass (negative reinforcement).

Drill software and drill approaches to teaching are underpinned by such techniques as *mastery learning* (Bloom 1986). Here students are encouraged to master basic skills before progressing to higher-order skills and competencies, while the teacher is required to present learning opportunities and activities that will enable students to demonstrate their knowledge, skills and understanding.

Teachers using ICT may find directed teaching specifically appropriate when they identify students who, perhaps for improved classroom management and a better learning environment for all, need to have a system of structured learning in place. They may also find it appropriate when certain prerequisite skills need to be in place before an element of active learning can be established.

COMMON MYTH'S ABOUT ICT

In the environment surrounding the potential and use of ICTs, many myths and misconceptions have developed and are being promoted across countries and institutions. It is important for decision makers to be aware of these myths in order to avoid making decisions based on them.

Myth 1.

Technology will replace the role of the teacher in the classroom.

Technology seems to be a tempting solution to plug the overwhelming gap of teachers that the world suffers from. Approximately a million, to be exact, which surely is not a great news, especially for the students. So, it is likely to be amazing if technology can take the place of the teachers.

But there still remains a problem. Technology doesn't work itself out. It doesn't ask questions like:

- Why has the child been sitting at the back for a week now?
- What is best way to ensure that each child's needs are met?
- Is the assignment cohesive?
- Did the students really understand the concept?

Consider this: a classroom without a teacher. Technology is flying off the walls, engrossing the students with the latest tidbits of information and resources.

But there isn't a single person who can say for sure what the best model of education for every child in the class.

How would you like that?

Technology can spin miracles out of everyday learning, throw in some really amazing models of teaching, analyze student skills and blend it all in into an interactive way of learning. But it can never build a beautiful teacher-student relationship that:

- facilitates the learning process
- builds an environment conducive to learning
- inspires students to build a good career out of their education
- can be empathizing and motivating when situation calls

Teachers always want the best for their students. But technology cannot identify the need of every student and come up with the best fix.

The bottom line?

Teachers are here to stay, technology will only make their jobs easier.

Myth 2.

Technology shoves the concept of contextual learning out of the window

How often have you come across the statement, "Technology makes learning virtual", pronounced with a hint of distaste? Let me tell you here that it is a stereotype, widely oversimplified to fit in a very negative perspective of technology in education.

The other half of the jury is adamant. They think technology plays an important role in education.

And I agree.

- Where would MOOCs (Massive Open Online Courses) be if technology wasn't integrated into education?
- Would accessibility mean a thing if technology wasn't made available everywhere?
- How would the information have come into our grasps had technology not been utilized in full force?
- How much would creativity had suffered if technology in education wasn't allowed to promote it in such a way?

Technology makes education more productive and learning easier. As for context, newer innovations like the **beacon technology** and so on upholds the touch of the real world in education. And so does the role of teacher as a facilitator.

However, many argue that it is an unnecessary distraction, threatening to take the focus out of the conventional learning. How can you thwart years and years of tradition, right? What they fail to realize is that technology eases out the creases in traditional education.

Things evolve with time. And hanging on to the roots solely for the sake of a proven track record of tradition doesn't make it any better. The problem is: if students are taught in the same ways that they were in the past, then it would rob them of a brighter future.

In defense of the distraction factor, technology has reached heights steep enough to assure you that distraction isn't allowed. This height is termed as "**Emotion sensors**". There, you have the problem solved.

Myth 3.

MOOCs will replace the concept of higher education

With the ever growing cost of education at colleges, graduates nowadays are burdened by the impending student loans hanging over their heads like a looming axe. This influences them to cut down on the basic luxuries. Add to that the Achilles' heel of no provision for personalization. And you have a winner in technology in the form of **MOOCs (Massive Open Online Courses)**.

This is because MOOCs eliminate these two significant problems.

- They are cost-effective.

- They are more customizable than university courses.

What more, they also provide degree certifications which are widely acceptable in employment agencies. Therefore, they have gained popularity in leaps and bounds with millions of students registering every day.

But then again, the rise in MOOC registrations gave birth to a major doubt. Will they replace universities? Well, no.

Online learning comes loaded with myths and so do MOOCs.

But the MOOCs cannot always match up to a traditional college degree and there is no way it can replace higher education. I'll give you four reasons.

- MOOCs do not strive to build a thriving and well-nourished ecosystem of ideas and objectives.
- They do not provide the chance of socialization. Without the right amount of exposure, there is little to no value of the skills gained.
- Students building a skill set solely through MOOCs do not have any real world scenario to apply the concepts in. This weakens the basics.
- MOOCs lack accountability. Think: how can you be completely sure that students are actually learning through MOOCs?

However, MOOCs can be a great mode of vocational education. They can help students to build upon the skills they have already acquired. This not only refines their abilities, but also stamps a valid accreditation to their names.

Sounds like a win-win situation to me.

Myth 4.

Integration of wearable technology is a distant future

If you are thinking this too, then you are far from the truth. Did you know that **13 million wearable technology devices have been shipped in 2013** and the count is expected to increase to 170 million in 2018?

What make wearable technology the new cool addition in education are the following:

- convenience and
- accessibility

It also ushers in the provision for innovations in learning. **Wearable technology** allows the smooth integration of blended learning. It facilitates hands-on learning, enables experimenting and stimulates an enriched learning experience. And it is making its way into education quicker than you thought.

With technology working its way up the education ladder, it is time to embrace the proliferation without believing in any preconceived conjectures or misconceptions.

These days, it is essential to make full use of educational technology in the classroom. It will benefit both the teachers and the students and is sure to make learning fun and effective. But for that, it is important not to fall prey to any of the myths doing the rounds. If you want to utilize educational technology, you must be well aware of every aspect of it. Only then you can expect to use it in way that's good enough to come in handy for you in the long run.

EVALUATING ICTs IN EDUCATION

USE OF ICT IN EVALUATION

At present the paper pencil tests are conducted for evaluating the academic performance of students. These tests are conducted in the group setting. The content coverage is poor and students cannot use them at their own. These tests are evaluated by the teachers and they may not give feedback immediately to each and every student. It may be due to this that students are unable to know their weakness and do not make any attempt to improve upon them. The ICT can be made use in the evaluation. One such attempt has been made by Sansanwal and Dahiya (2006) who developed Computer Based Test in Research Methodology and Statistics. It has been titled as Test your Understanding: Research Methods and Statistics. This test can be used by individual student to evaluate his learning. The student can instantaneously get the feedback about the status of his understanding. If the answer is wrong, he even can get the correct answer. It goes a long way in improving the learning and teacher has no role to play in it. It is left up to students to use it. Such tests can be uploaded on the website for wider use. The students from other institutes can also make use of it. Not only the students even the teachers can also use it to assess their own understanding of the subject. If used by teachers before teaching the topic, they can prepare the topic properly. Such software can be used for internal assessment. Thus, ICT can be used to improve the quality of pre as well as in-service teacher's training.

STRENGTH OF ICTs

The Effectiveness of ICTs in Education:-

ICTs are a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies—scattered and rural populations, groups traditionally excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time constraints are unable to enroll on campus.

- ***Anytime, anywhere.*** One defining 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. Online course materials, for example, may be accessed 24 hours a day, 7 days a week. 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).

- ***Access to remote learning resources.*** Teachers and learners no longer have to rely solely on printed books and other materials in physical media housed in libraries (and available in limited quantities) for their educational needs. 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. 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.

ICTs help prepare individuals for the workplace.

One of the most commonly cited reasons for using ICTs in the classroom has been to better prepare the current generation of students for a workplace where ICTs, particularly computers, the Internet and related technologies, are becoming more and more ubiquitous. Technological literacy, or the ability to use ICTs effectively and efficiently, is thus seen as representing a competitive edge in an increasingly globalizing job market.

Benefits/Advantages of ICT in Education

Here are some of the benefits which ICT brings to education according to recent research findings.

General benefits

- **Greater efficiency throughout the school.**
- **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 students' learning.

Benefits for teachers

- 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 hours.

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 (Jacobsen and Kremer, 2000)
- Development of higher level learning styles.
- Students who used educational technology in school felt more successful in school, 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 than in a traditional classroom
- Broadband technology supports the reliable and uninterrupted downloading of web-hosted educational multimedia resources
- Opportunities to address their work to an external audience
- Opportunities to collaborate on assignments with people outside or inside school

Benefits for parents

- Easier communication with teachers
- Higher quality student reports – more legible, more detailed, better presented
- Greater access to more accurate attendance and attainment information
- Increased involvement in education for parents and, in some cases, improved self-esteem
- Increased knowledge of children's learning and capabilities, owing to increase in learning activity being situated in the home
- Parents are more likely to be engaged in the school community

- You will see that ICT can have a positive impact across a very wide range of aspects of school life.

The use of ICTs help improve the quality of education

ICTs can enhance the quality of education in several ways: by increasing learner motivation and engagement by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs are also transformational tools which, when used appropriately, can promote the shift to a learner-centered environment.

Motivating to learn. ICTs such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. More so than any other type of ICT, networked computers with Internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events.

Facilitating the acquisition of basic skills. The transmission of basic skills and concepts that are the foundation of higher order thinking skills and creativity can be facilitated by ICTs through drill and practice. Educational television programs such as Sesame Street use repetition and reinforcement to teach the alphabet, numbers, colors, shapes and other basic concepts. Most of the early uses of computers were for computer-based learning (also called computer-assisted instruction) that focused on mastery of skills and content through repetition and reinforcement.

Enhancing teacher training. ICTs have also been used to improve access to and the quality of teacher training. For example, At Indira Gandhi National Open University, satellite-based one-way video- and two-way audio-conferencing was held in 1996, supplemented by print-materials and recorded video, to train 910 primaryschool teachers and facilitators from 20 district training institutes in Karnataka State. The teachers interacted with remote lecturers by telephone and fax

WEAKNESSES OF ICTs

- ICT equipment is expensive and needs trained staff to maintain it correctly.
- hardware can be unreliable leading to breakdowns which cause frustration.
- using ICT means children can become dependent on computers and technology and not learn how to do things by hand
- internet can lead to children accessing unsuitable sites.
- plagiarism has increased as students find pre written work online leading to students gaining unfair results on coursework.
- **High Costs:** Implementing ICTs in the education setting can be quite costly regarding updating existing infrastructures, training teachers and developing quality course materials. To make matters worse, funding for such projects is often scarce.
- **Teacher Training:** Many teachers are unfamiliar with using ICTs in the classroom and are resistant to incorporating such technologies into their established pedagogies. To succeed, the use of ICTs in education needs to be supported by well-trained teachers.
- **Uncertain Success Rates:** Currently, no large-scale studies have been conducted that show whether or not the use of ICTs in an educational setting will result in a measurable increase in individual student achievement, making school administrators hesitant to invest in these technologies
- **Access To Inappropriate Content**
The biggest concern when it comes to the use of technology in schools is how easy pornographic, violent, and other inappropriate materials can be accessed and viewed. This could cause big problems if the material is shared with other students while in the classroom.
- **A Disconnected Youth**
This harmful effect of technology has already come to light in today's world. People are attached to their screens almost 24/7, which is causing an entirely new set of social issues to pop up. This translates into the school system in a bit of a different way, however. More and more students are experiencing social anxieties when it comes to face to face interactions, but are perfectly fine socializing online.
- **The Cyberbullying Trap**
Giving students access to anonymous accounts and endless contact avenues can only lead to trouble. Cyber bullying has become a real and in our face problem among young people today. This harassment has no end, which includes the class room. There is also no way to monitor or discipline students who are involved.
- **Inevitable Cheating**
While have an easy access to information may seem like a great thing, it can become a real problem in a test taking environment. Cell phones have made cheating easier than ever. You no longer have to figure out how to write all of the answers down, you can just look them up!
- **A Major Distraction**
Attentiveness drops drastically in the classroom when students have their cell phones or other technologies out. The focus shifts from their teacher and education, to whatever they are looking at, playing, or doing on their phones.

USE OF ICT IN TEACHING

Teaching at School as well as Higher Education, mostly, concentrates on giving information which is not the sole objective of Teaching. Along with giving information, the other objectives are:

- developing understanding and application of the concepts
- developing expression power
- developing reasoning and thinking power
- development of judgment and decision making ability
- improving comprehension, speed and vocabulary
- developing self-concept and value clarification
- developing proper study habits
- developing tolerance and ambiguity, risk taking capacity, scientific temper, etc.

With the present infrastructure, class size, availability of teachers, quality of teachers, training of teachers, etc., it is difficult to achieve all the objectives. Further, most of the teachers use Lecture Method which does not have potentiality of achieving majority of above mentioned objectives. The objectives are multi-dimensional in nature, so for their achievement multiple methods should be used in an integrated fashion. At present ICT may be of some use. It is a well known fact that not a single teacher is 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.

On INTERNET many websites are available freely which may be utilized by teachers and students for understanding different concepts, improving vocabulary, developing Reasoning & Thinking, etc. ICT can help in preparing students for SAT, GRE, TOEFL, etc.