UNIT 1

INFORMATION AND COMMUNICATION TECHNOLOGY

Definition, meaning, importance and scope of ICT - Applications of Information and Communication Technologies - Classroom and ICT; Professional development and ICT -Emergence of new information technology- convergence of computing and telecommunications.

INFORMATION AND COMMUNICATION TECHNOLOGY

ICT is a broad and comprehensive term, which comprises Information Technology and Communication Technology. The information Technologies are powered by two types of communication Technologies. Satellite based communication -Communication takes place between sender and receiver through satellite. Terrestrial based communication- Communication takes place through a network

Definitions of ICT

There are many definitions of ICT.ICTs are defined as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information"

According to United Nations Development Programme,

ICTs are basically Information handling tools a varied set of goods ,applications ,and services that are used to produce ,store , process, distribute and exchange information. They include old ICTs of radio, television and telephone and the new ICTs of computers, satellites and wireless technology and the internet.

According to UNESCO

"ICT is a scientific technological and engineering discipline and management techniques used in handling information and application and association with social, economic and cultural matters".

Meaning:

- Information and communication technology can simply define in its simplest forms as an electronic medium for creating, storing, and manipulating receiving and sending information from one place to another.
- It makes message delivery faster, more convenient, easy to access, understand and interpret.
- It uses gadgets such as cell phones, the internet, wireless network, computer, radio, television, satellite, base station etc.
- These resources are used to create, store, communicate, transmit and manage information.

Nature of ICT

ICT has some features

- Speed:

  Modern mobile technology allowed people to communicate with each other in real time

- Precision

  The Information that is communicated through ICT which provides less chances of miscommunications

- Versatile:

  ICT can help in doing multiple tasks. It provides a multi-media platform for such communication

- Cost

  ICT tools are very expensive. But it can be used by any number of used without incurring additional cost.

- Digital Divide

  Digital Divide refers to a large difference between two or more groups in population in the distribution and effective use of ICT resources.

- Hacking

  To access our accounts through user id and password which support safe internet usage.

- Unauthorized content use

  It allows to access duplication of the content in digital form of data.High speed internet and high capacity storage devices have made it easy.

- Trolls and abuses

  Internet is also a platform to express personal enmity in the form of trolling and abusing people online.

- Pornography

  Child pornography is a criminal activity mainly happening through internet medium.

- Viruses

  Viruses are relatively simple program written by people and designed to cause nuisance or damage to computer or their files

- Privacy concerns

Internet is also a hub of lot of personal data. It is possible to track individual activities in the internet.

- Health:

  Excessive internet usage is also associated with low attention problems

CONCEPT OF ICT

- ICT means the use of computer-based technology and internet to make information and communication services available in a wide range of users.
- ICT is a software and hardware that enable society to create, collect, consolidate and communicate information in a multimedia format and for various purposes.
- The term ICT includes any communication device such as radio, TV, Cellular Phone, computers and network, hardware, software, Satellite system and so on.

Some of the new ICT & digital technologies are as follows

- Multimedia Pcs, Laptop, Notebook
- Digital Camera/Video
- LAN & WAN
- Internet and Intranet
- WWW (World Wide Web)
- Internet
- Online Databases
- Video conferences

- E-mail, discussion list and newsgroup and chat
- Digital Libraries
- E-books/e-journals/e-databases
- Floppies, CDs and DVDs
- Offline databases
- Cell phones with Internet connection
- Digital camera and moving pictures
- Computer mediated conference
- Video conferencing
- Telemedicine
- Virtual reality
- Telecommunication satellites
- Interactive TV and Radio

USEFUL CONCEPT OF ICT

It describes the understanding, management and configuration of the available technology might vary the concept of ICT

- A collection of tools and devices used for particular task

  E.g.: publishing, course delivery, and transaction processing

- Organized set of equipment for working on information and communication

  E.g.: workshop

- Components of integrated arrangement of devices that enable information to be collected processed, stored, and shared with others.
- Components in a comprehensive of Information and devices that enables learning, problem solving and higher order collaborative thinking.

CHARECTERISTICSS OF ICT

There are many special characteristics of ICT. Some special characteristics are

Effectiveness

- Most interactive
- Fewer errors
- Customized
- Personalized
- Achievable
- Transparent
- Searchable
- Acceptable

Efficiency

- Faster
- Cheaper
- Fewer steps
- Lower costs
- Fewer people

- Less paperwork

Innovation

- New product
- New technologies

IMPORTANCE OF ICT

- ICT act as a learning tool.
- It helps to solve a problem scientifically.
- It makes information storage and retrieval easy.
- It enhances computer networking i.e. internet and intranet.
- It accelerates economic development nationally.
- It creates gainful employment.
- It makes comprehension of other subjects easy.
- It creates an avenue for exchange of information among scholars locally and internationally
- It is the basis for e-learning and online library
- It is globalized.
- It is used for proper documentation of official activities and administration.

SCOPE OF ICT

The scope of ICT is broad and constantly evolving, as new technologies and innovations continue to emerge.

- Communication:

- ICT enables communication through various platforms such as emails, Video conferencing, instant messaging, and social media.
- Data Processing and Management:
- ICT tools like databases, spreadsheets, and data visualization software help in processing and managing large amounts of data.
- Education and Training
- ICT is widely used in education and training to create interactive e-learning modules, virtual classrooms and outline tutorials.
- E-commerce:
- ICT enables business to sell products and services online through e-commerce platforms and digital marketplaces.
- Entertainment:
- ICT provides access to various forms of entertainment such as online games, streaming services, and virtual reality experiences.
- Healthcare:
- ICT is used in the healthcare sector for telemedicine, electronic health records, and remote monitoring of patients.
- Information and news:
- ICT platforms like new websites, blogs and social media provide to access to information and news from around the world.
- Banking and Finance:
- ICT is used in the banking and finance sector for online transactions, digital payments, and financial management.

- Robotics and Automation:
- ICT is used to control and automate various industrial processes through robots and other automation systems.
- Transportation and Logistics:
- ICT is used in transportation and logistics to track and manage the movement of goods.

CHALLENGES OF ICT

Some of the challenges of ICT are

- Expensive ICT materials:
- Highly technical and practical driven
- Poor orientation about the concept
- Underdevelopment
- Universal accessibility as a compulsory field of study
- Hijack (evil purpose) by unscrupulous persons
- ICT has advantages as well as disadvantages.
- It emerges new ways of problem solving

ICT APPLICATIONS

Information and Communication Technology (ICT) is used in the most of fields such as e-commerce, e-governance, banking, agriculture, education, medicine, defense, transport, etc.

i) ICT in Entertainment:

ICT offers a variety of entertainment and leisure activities and allows for quick access to movies or music that can be easily accessed and we can watch movies and listen to music directly from the internet.

ii) ICT in Medical Science:

- ICT are related to the devices, resources and tools needed to improve the acquisition, retrieval, storage and use of information in health and biomedicine.
- Medical devices that exist in ICT helps to detect and treatment of diseases.
- Health informatics tools include medical terms, clinical guidelines, computers and Information and Communication system.

iii) ICT in Finance

ICT helps to transfer of money through the use of credit cards or e-commerce, which includes the purchase and payment via internet and others.

iv) ICT in public sector Management

- ICT provides greater public access to information and constitutes opportunities.
- ICT allows people to perform many different activities such paying bills or renewing official documents such as driving licenses and others over the Internet

v) ICT in Home Electronics

- The use of ICT is used to increase access to home care.
- It helps to manage the house through a system that control lighting, home security, air conditioning and others.

vi) ICT in Education

ICT improves the way of education and provides better educational environment through the use of computers, tablets, data displays, interactive electronic boards, and others in the process of communicating information to students.

vii) ICT in Agriculture

- ICT helps to enhance agricultural and rural development through better information and communication processes.
- ICT also helps empower rural people by providing better access to natural resources, effective production strategies, and digital marketing strategies for agribusiness and financial services etc.

viii) ICT in Business

- ICT helps companies analyse, store process and share vast amounts of data and make better use of products and resources.
- ICT tools also help improve profitability, reduce cost compared to manual tasks and minimize lead times.
- ICT Systems allow managers and employees to make decisions quickly and accurately.

ICT ENABLED CLASSROOM FOR CREATING AUTONOMOUS LEARNER ISSUES AND CHALLENGES

ICT enabled classroom includes computers, projectors, speakers, touch pad-pen, learning software and mobile applications. ICT used in the classroom is important for giving students opportunities for effective learning. Autonomous learner is an individual who is responsible for his/her education. Autonomous means self-directed or working independently. An Autonomous learner involves

Self-taught, decision making and take charge of their learning strategies. An autonomous learner holds the responsibility for his/her education.

Characteristics:

- Self-discipline
- Logical intelligence
- Independence
- Self-motivated.

Issues and challenges:

The benefits of ICT enabled classrooms which include

• Increased student engagement

In ICT enabled classroom teachers can incorporate them into lessons to make them more relatable and enjoyable. Additionally, teachers can use music, video, podcasts, and other media to build creative, interactive lessons.

• Encouraging teamwork and collaboration

The ability to collaborate as part of a pair, group, or team is a valuable life skills for students to learn. Introduced gamified learning activities either through edtech software or DIY lessons that require students to work with one another to do research and complete learning objectives to make learning an exciting, challenging, and supportive experience for everyone.

• Preparing students for life after graduation

The ability to use technology effectively is an increasingly vital skill, not only in K-12 education, but in the lives of students after graduation. College courses are more frequently being offered online or hybrid between class room meetings. Students who are able to navigate technology for e-learning and research purposes

are better prepared for college learning environment and careers that will require understanding of Microsoft office products, typing skills, the ability to communicate by e-mail, managing digital calendars and more prospective candidates

- **Connecting students and teachers**

Introducing technology into your classroom will provide new ways to strengthen peer –peer and student- teacher relationships as well as foster a supportive learning environment for students. Use classroom e-mails to connect students with one another fortutoring/homework help and mentorship and to give students a means to contact you for assistance with lessons/homework and feedback.

- **Improved teaching outcomes**

Educational technology can be used to design lessons that allow for more thorough absorption of knowledge and improved learning outcomes. Engage students in web quest and other inquiry based learning that empowers students to research independently , construct questions, find answers and problem solve to gain an understanding of a subject or concept.

- **Supporting differentiated instruction**

The scenes function in teacher is incredibly useful in supporting differentiated instruction. Teachers can use scenes to design a template of websites and pages that students are granted access during a given lesson.

Challenges

Common challenges and concerns teachers experience when integrating technology and digital media in the classroom include

- **Students misusing Technology**

With the introduction of technology in the class room we sure, to encounter students attempting to misuse it, largely for entertainment purpose instead of educational ones. The teachers are able to lock student's devices at times they aren't needed to avoid students using them during videos, presentations, or when guest speakers are visiting.

- **Teacher Knowledge and professional Development**

Teachers who have struggle with professional development resources to help them gain the knowledge and familiarity to introduce technology reliably and effectively.

- **Keeping students safe online**

Increased access to technology can leave students vulnerable to either intentionally or otherwise being exposed to graphic content, online predators, scammers and hackers, and cyberbullying.

- **Cost of new technology**

Not all classroom budgets are able to sustain the new technology in the class room.

- **Keeping up with changes**

Education technology can quickly updated with some changes .A major barrier many teachers struggle with when Introducing technology into their class room is keeping up with these many changes and trends.

SUGGESTIONS FOR EFFECTIVE USE OF ICT

ICT enabled classroom suggest the effective use of ICT in three different ways

- Various ICT tools available for class room
- Teaching Learning Apps and its features
- Attitude of different stakeholders towards use of ICT

i) Various ICT tools available for classroom

In ICT enabled classroom, we can use various tools like Microsoft PPT, The Internet, Interactive Whiteboard, Projector, Computer, Touch Pen Pad, e-books, Visualizers etc. with the help of given tools we can conduct our ICT based class in effective and appropriate manner.

ii) Teaching Learning Apps and its features

In ICT enabled class room we can use various Teaching-Learning application like Google Classroom, EDMODO, and SSPS etc. It has following features

With e-mail id we can get registered in this application

- It requires less space to install
- It supports to transfer any file format.
- Perfect Quiz and assignment facility is there.
- On line discussion can be done by using social networking sites.
- Multiple teachers and students can join same class simultaneously
- Grade system is using to evaluate quiz or assignment

iii) Attitude of different stakeholders towards use of ICT

Positive attitude create proper use of ICT. Proper use of ICT tools can helpful in catering the needs of different type of learners proper training and accessibility to the ICT resources will not only help the teachers and the students but at the same time will be helpful in creating constructivist classroom and thus autonomous Learner.

PROFESSIONAL DEVELOPMENT AND ICT

ICT support personal development in different ways. It can be grouped into three categories

- A focus of study - It helps to develop teacher's ability
- A delivery System- It helps to develop the Knowledge and mastery of content
- A catalyst for new forms of teaching and learning

It supports different methods of learning such as inquiry-based learning, collaborative learning and other forms of learner centred pedagogy.

Professional development based on three important aspects

- Learning how to use ICT
- Learning through ICT
- Integration of ICT in teaching and teacher learning

Learning How to use ICT

Some typical questions may have address while learning how to use ICT

- How do I use ICT? (Technically)
- What can ICT help me do? (Functional)
- How can I use ICT tools with so many students? (Logistical)
- Will these ICT tools and technologies replace me as a teacher? (Affective)
- How do I organize my classroom to support the use of ICTs? (organizational)
- How can I learn from and with ICTs? (conceptual)

- How can ICT help my students learn in different ways? (Instructional)
- How do I assess student learning in ICT based projects? (Evaluation based)

ICT used in different ways based on its Application

- Learning ICT use for instructional planning
- Learning ICT use for facilitating learning
- Learning ICT use for assessment
- Learning ICT use for school management
- Learning ICT use for Inclusive classroom
- Learning ICT use for strengthening school community relationship

In all these areas ICT can be meaningfully integrated.

Example

The teacher teaches the lesson before that learn three different things

- To develop a digital lesson plan (learning how to use ICT)
- To develop student record database and need to learn about database management tools (learning through ICT)
- A teacher needs to learn a spreadsheet application for organize, process and analysed the data (integration of ICT in teaching-learning)

TEACHER PROFESSIONAL DEVELOPMENT THROUGH ICT

In this section we explore various opportunities available for professional development of a teacher through ICT

i. Online Learning Platforms

Internet is a host for a large number of learning opportunities by offering online courses. The online learning platform supply reading materials as well as opportunity to post our learning. Some examples of online learning opportunities

- The Open University, London is offering various courses that are useful for teachers. one of the most popular courses offered in Education section accessed from http://www.open.edu/openlearn/education.
- Commonwealth of Learning offers a free online course of "Teacher ICT Integration" for teacher training institutions at common wealth countries. Resources and online materials of the same can be downloaded from http://cctionline.org/

ii) Massive open and Online course (MOOCs)

MOOC is online learning platform in which any number of participants, and anyone interested in learning can learn at fixed given timeframe in modular form. It has a course in a MOOCs would long anywhere between 6 to 16 weeks. The course contents are structured on a weekly basis. The course participants are expected to go through the readings, videos, workshops activities, assessment exercise to complete a course.There are many MOOC platforms

Coursera:

Coursera works with top universities and organizations to make some of their courses available online and free, and offers courses in many subjects. This can be accessed from **https://www.coursers.org/**

Example

The course in coursera is"The Art of Teaching History: A Global Conversation for secondary Educators" is a open and free course offered by Rice University. You have to sign up for the course from https://www.coursera.org/course/teachinghist

edX:

edX is a MOOC provider. It hosts online University-level courses which include some courses at no charge. edX can accessed from http://www.edX.org/

Social media Networks

Social media-based platforms provide access to professional organizations and resources of value to adult learners. Online communities created in these social media spaces provide opportunities to share resources, spark questions that expand collective learning and make connections that sometimes lead to employment offers consulting request and collaboration opportunities.

- Most highly valued use of such network is sharing ideas. Spaces such as Twitter(http://twitter.com/),
- LinkedIn(http://in.linkedin.com/)
- Facebook (http://www.facebook.com/)
- Google + (http://plus.google.com/)

Example:

Some educators use PLN (personalized Learning Network) which is an exclusive educator access by http://edupln.ning.com/)

Web 2.0 technologies

Web 2.0 technologies such as blogs, wikis, and podcasts have been considered as Social software because they are perceived as being well connected, allowing users to develop web content collaboratively and open to the public.

Blog:

- Following Blog written by others in the profession is a good way for one's professional development. Blog also provided opportunities to interact asynchronously.
- Writing blog is another way of engaging professional development.

Wiki

Wiki is another web 2.0 technology which is a type of interactive website where the Webpages are editable by the user of the site. Users are able to edit existing pages and add new pages to the site. This allows groups to collaborate on the creation of web-based information. The wiki users can keep the content improving till the members of the community are satisfied with the content.

Useful wiki for teachers

- Wikipedia- https://en.wikipedia.org/
- Wikimedia- http://wikimapia.org/
- Wiki How- http:// www.wikihow.com/

Social Bookmarking

Social bookmarking is an online service through which adding, annotating, editing and sharing bookmarks of online resource is possible. A teacher could identify various online sources and shortlist the most useful ones. This collection of sources is useful for every teacher teaching the topic.

Example:

Some of the most popular social bookmarking service provides are Diigo, stumble upon, delicious with the help of the following links

- http://www.diigo.com/
- http://www.stumbleupon.com/

- https://www.delicious.com/

Groups:

Online groups: online groups are the ways to connect people through formation of groups. People have mail id that is a common domain can be brought together. Ex: people having g-mail account can be grouped together to form a Google group. Similar mail groups formed among people with mail id in yahoo domain.

Instant messaging: Instant messaging service is very popular among communities for two reasons.

- First it is available in the form of smart phone application. It is easily accessible.
- Second it provides real time interaction. It provides lively interaction and help the teachers to share information and provides platform for conversation. So it is very popular. Eg: WhatsApp

i) Posting:

Every member of a group can post information to the group in variety of forms. The posting could be text message, image, video, or even audio file. Documents are frequently photographs and posted in groups. Post can be many formats, there is wider participation in the group interaction.

Example:

Science teachers WhatsApp group is expected to interact on issues of science teaching and learning. Group members could arrive at certain norms for posting in groups so that interaction is fruitful.

Podcast:

Podcast is another web 2.0 technologies that are useful for teachers. Podcast become very handy when they are in need. Since the audio format can be played

on mobile phones, they are available for teachers for convenient professional development.

Example: ISTE podcast- on how technology is changing the classroom

Teacher created materials- http://www.teacherscreatedmaterials.com/podcast/

NASA science Cast- http://science.nasa.gov/science-news/sciencecasts/

Web conferencing

Web conferencing allows us to connect and communicate in real- time with people in different locations through internet. Web conferencing combines graphics, such as PowerPoint presentations, with voice and or video. It also includes interactive tools such as polling/voting, chatting and a hand rising feature to indicate that you have a question or comment. It also may include sharing, a whiteboard and web surfing features. Web conferencing is differ from webcasting. Webcasting refers to a session that is recorded and streamed to participants at a time of their choice. Hence webcasting does not happen in real time. A live web conferencing sessions can be recorded and provided as a webcast after the event. Web conferences are often referred to as webinars, a term derived from combination of web and seminar. Web conferencing is most effective when used with individuals who are in different locations. Web conferencing has become popular for delivering professional development to teachers. Whenever an expert be it a subject expert, pedagogic expert or teacher expert need to be invited from far off place, webinars are found to be a good tool for hosting such interactions.

Example

WebEx, Centra, and adobe Connect, Dimdim ,Yugma and WizIQ are popular free services.

TEACHER PROFESSIONAL DEVELOPMENT IN INTEGRATING ICT

The role of the teacher in teaching and learning process is vital. The use of ICTs as a tool in this process does not do away with the role of the teacher. Teacher training and on-going relevant professional development are essential if benefits from investments in ICT are to be maximised.

Role of the Teacher

In teacher professional development in Integrating ICT, the role of teacher is the important one

- The teacher should remain central to the learning process
- Lesson plan is crucial when using ICTs

Pedagogy

Pedagogy is the second deciding factor of teacher professional development in integrating ICT. Because introducing technology alone will not change teaching and learning process.

- ICTs seen as tools to help the teachers create more learner-centric learning environments
- ICT can be used to support change and to support /extend teaching practices
- Using ICTs as tools for information presentation is of mixed effectiveness

Teacher professional Development

Teacher training and professional is seen as the key driver for successful usage of ICTs in education.

Teacher professional development is a process, not an event

One –time teacher training workshop have not been seen as effective in helping teachers to feel comfortable using ICTs, till it integrating successfully into their teaching.

ICTs expands the needs for on-going professional development of teachers

Effective ICTs use in education increases teacher training and their professional development needs, by helping to provide more and better educational content, provides models and simulations of effective teaching practices and learner support networks.

Successful teacher professional development model can be divided into three phases

- Pre-service

  It focusing initial preparation on pedagogy, subject mastery, management skills and use of various teaching tools.

- In-service

  It includes structured, face-to face and distance learning opportunities and building pre-service training to the teacher needs.

- On-going

  Provide Formal and informal pedagogical and technical support enabled by ICT for teachers' daily needs and challenges.

Effective teacher professional development should model effective teaching practices

Effective teacher professional development should approximate the class room environment as much as possible. Hands-on instruction on ICT is necessary for teaching learning process. In addition, professional development activities

should model effective practices, behaviours and encourage and support collaboration between teachers.

Training in assessment methods

- Professional development should include methods for evaluating and modifying pedagogical practices and expose teachers to a variety of assessment methods.
- Effective professional development requires substantial planning
- For substantial planning we should proceed the assessment of participation in teacher professional development activities, regular monitoring and evaluation of these activities and feedback should be established.
- A variety of changes in curriculum, assessment and providing more autonomy to the schools help to optimize teacher use of ICTs.

STRAEGY FOR ENHANCING ACADEMIC PROFESSIONAL DEVELOPMENT

Professional development is gaining new skills through continuing education and career training after entering the workforce. With right strategy social media can make studying more collaborative and efficient. Ten strategies are used to enhance academic professional development.

Focus on honing classroom teaching skills

This is one of the most important purposes of teacher professional development is enhance students learning.

Use it to develop subject matter expertise

Helping teachers gain advance expertise in key academic areas especially those who have a personal and professional and satisfaction interest, can pay dividends in student achievement as well as teacher engagement.

Provide strategy for overcoming specific challenges in the classroom

Teacher development program on such important topic a bullying prevention and classroom management provide valuable insight and perspective into aspects of educational experience that can help set the stage for optimal learning.

Encourage added value through networking and collaboration

Meaningful interactions with expert instructors and experienced fellow educators are another valuable aspect of enhancing professional development.

Consider different formats

Personal development courses and one-off workshops are two of the most common formats for teacher professional development.

Don't forget technology

Some teachers are resistant to technology, others may surprise to discover that it can enhance their ability to help students thrive in digital age.

Keep it simple and specific

Formal training for educators and specific in depth training are yield actionable classroom that make professional development course as simple.

Make it ongoing

Professional development training is most effective when paired with ongoing support and evaluation from the administrators including opportunities to review and learn from what worked and what did not. Regarding opportunities for ongoing, the professional development departments at some universities offer educators the option of completing certificate programs. Multicourse programs describe demonstrate the mastery of the specific subject area or body of knowledge

Create opportunities for feedback

Many schools do a job at developing system for providing teachers with helpful feedback and for determining whether professional development initiatives are having an effect on student teachers in their district and by using online professional development courses to develop new connections with educators from other locals

Actually, put new training to work in the classroom

Teacher professional development is only effective when educators put what they have learned to use in their teaching. PD training is essential teachers commit to continuing the work in the classroom.

KEY STATEMENTS OF CONTEXT OF EDUCATION STRATEGY AND CURRICULUM IN THIS REGARD INCLUDE

- In July 2011, the Department of Education launched the National Strategy: Literacy and Numeracy for Learning and Life 2011-2020. The strategy set out a clear vision for raising standards in literacy and numeracy in early learning and care (ELC), primary and post-primary settings by 2020.

- NCCA (2009) (National Council for Curriculum and Assessment). The six key skills of junior cycle are Managing Myself, Staying Well, Communicating, Being Creative, Working with Others, and Managing Information and Thinking. Working with digital technology also forms part of each of the skills.

- The primary purpose of **school self-evaluation** is to improve the quality of learner outcomes. **School self-evaluation** is an internal, reflective. School self-evaluation involves reflective analysis focused on action plans for improvement with evidence gathered in the unique context of each school. This process allows the school to use evidence and set specific meaningful goals and activities.

- Project maths curriculum at post primary level (NCCA, 2008). Project maths is dynamic development in education. It involves empowering students to

develop essential problem-solving skill for higher education and workplace by engaging teenagers with mathematics set in interesting and real-world context.

A new primary Language Curriculum:

The Primary Curriculum Framework forms the basis for high-quality learning, teaching, and assessment for all children attending primary and special schools. It reflects our shared understanding of, and trust in, the many positive features of education in our primary and special schools while providing the blueprint for guiding the enhancement of primary and special education for the coming years.

The framework:

- builds on the successes and strengths of previous curricula while recognising and responding to challenges, changing needs, and priorities
- provides agency and flexibility in schools
- makes connections with what and how children learn in preschool, primary, special, and post-primary schools
- identifies and responds to emerging priorities for children's learning
- changes how the curriculum is structured and presented
- Supports a variety of pedagogical approaches and strategies with assessment central to learning and teaching.

As developments progress, new curriculum specifications will be developed for the five curriculum areas and their associated subjects, and toolkits will be provided to support learning, teaching, and assessment. The video resources below have been developed to support teachers and school leaders to become familiar with the contents of the framework. In developing the strategy, the department has taken account of the recent economic challenges and the recent economic

challenges and the ongoing pressures on public finances while looking to the future and anticipation of economic growth.

Students:

- Using ICT to open new forms of learning and collaboration to support different styles of learning
- Experiencing joy, satisfaction, passion and success in their education and lifelong learning.
- Actively engaged in learning
- Accepting ownership of their learning
- Using technology to achieve personal learning goals and to succeed in various learning activities
- Using ICT critically and ethically

Teachers

- Providing student cantered guidance and feedback
- Engaging collaborative project based learning activities
- Supporting students to create and innovate so that they are engaged in managing their own learning goals and activities

Schools

- Taking a lead role in planning how the teachers and students will effectively embed in ICT
- Developing policies and practices for the safe and ethical use of ICT

- Strengthening their existing relationships with community both local and global

Parents and Guardians

- Engage their children to use of digital technologies.
- Collaborate and participate in school activities.

Curriculum

- Curriculum which includes clear statements that focuses on digital learning skills.
- Curriculum specifications will support in-depth study of ICT

BENEFITS OF EMERGING TECHNOLOGIES FOR EDUCATION

It provides a broader range of materials that are easily accessible.

Today's huge diversity of educational technology provides students with a plethora of options from which to select the finest ones for their learning requirements. This assists learners in developing the necessary skills and information to become competent professionals in their chosen industry.

It aids in the improvement of learners' communication skills as well as their performance at work as well outside work.

Learners who can communicate more effectively through electronic methods will perform better academically as well as in employment contexts because communication skills are critical when you want to get your point across effectively.

It provides learners with a fun and engaging learning experience.

Today's students must not only learn, but they must also have pleasure while doing so. Educational technology allows learners to have fun while learning, which helps them stay motivated and interested in learning a new skill.

It enables learners to access the internet from any location at any time.

The internet has become such an indispensable part of our lives that it is difficult to find somebody who does not use it regularly. In today's environment, everyone must be able to access the internet from anywhere at any time to do their projects and research without having to travel all over a place or wait for a particular time when they can do so. Learners benefit from educational technology in this sense since it allows them to access the internet even while they are in a classroom, at school, or at home.

It assists mentees in learning new skills and gaining new knowledge.

Learning new skills and knowledge are two very important areas of life that mentees should be able to appreciate. Learners can gain these abilities and expand their knowledge through numerous online programs by utilizing educational technologies. These programs provide students with the opportunity to learn about a variety of topics that are both intriguing and relevant to their fields of work or study.

It enables learners to improve both mentally and physically.

The advantages of employing instructional technology can include bettering learners' mental and physical wellness. Learners can improve their academic performance and physical health by using these tools, which assist them to improve their learning and cognitive skills.

It assists students in staying current with technological advancements.

Learners who can keep up with the newest technology advances will be able to expand their knowledge of various fields and develop new talents that they can utilize in the future. These beneficiaries will also be more likely to secure employment because they will have a thorough understanding of the latest trends in various fields and be able to help companies become more efficient by knowing how new technologies can be used for various purposes. As we have seen,

technology can be used in many different ways to support education. Teachers need to be well-versed in the latest technological tools so that they can properly engage their beneficiaries. Employing instructional technology at the first level of institutions is one way to rise above the challenges of today's education industry.

THE CONVERGENCE OF TELECOMMUNICATION AND COMPUTING

Both computing and telecommunications are experiencing a technological revolution. The networked computer is transcending its traditional focus on numerical computations and information organization and retrieval by serving as a communications platform. Convergence is the merging of communication platforms such as; feature films, print, television, radio, live experiences, theme parks, games, the Internet along with portable and interactive technologies through various digital media platforms. Media Convergence means the interconnection of communication technologies, computer networks, media content and information. Telecommunications, also known as *telecom*, is the exchange of information over significant distances by electronic means and refers to all types of voice, data and video transmission. This is a broad term that includes a wide range of information-transmitting technologies and communications infrastructures, such as wired phones; mobile devices, such as cell phones, microwave communications, fibre optics, satellites, radio and television broadcasting; the internet; and telegraphs. A complete, single telecommunications circuit consists of two stations, each equipped with a transmitter and a receiver. The transmitter and receiver at any station may be combined into a single device called a transceiver. The medium of signal transmission can be via electrical wire or cable -- also known as copper -- optical fibre, electromagnetic fields or light. The free space transmission and reception of data by means of electromagnetic fields is called wireless communications.

Types of telecommunications networks

The simplest form of telecommunications takes place between two stations, but it is common for multiple transmitting and receiving stations to exchange data

among themselves. Such an arrangement is called a telecom network. The internet is the largest example of a telecommunications network. On a smaller scale, examples include the following:

- corporate and academic wide area networks (WANs);
- telephone networks;
- cellular networks;
- police and fire communications systems;
- taxi dispatch networks;
- groups of amateur (ham) radio operators; and
- Broadcast networks.

Data is transmitted in a telecommunications circuit by means of an electrical signal called the carrier or the carrier wave. In order for a carrier to convey information, some form of modulation is required. The mode of modulation can be categorized broadly as analog or digital. In analogue modulation, some aspect of the carrier is varied in a continuous fashion. The oldest form of analogue modulation is amplitude modulation (AM), which is still used in radio broadcasting at some frequencies. Digital modulation actually predates AM; the earliest form was Morse code. Modern telecommunications use internet protocols to carry data across underlying physical transmissions. Telecommunications systems are generally run by telecommunications service providers, also known as communications service providers. These providers historically offered telephone and related services and now offer a variety of internet and WAN services, as well as metropolitan area network (MAN) and global services.

Conclusion:

In this unit briefly described about the Definition, meaning, importance and scope of ICT, Applications of Information and Communication Technologies, Classroom and ICT, Professional development and ICT -Emergence of new information technology- convergence of computing and telecommunications.

UNIT 2

ICT MEDIATED EDUCATION

Concept, Importance, Meaning, and Objectives & Nature of ICT mediated education -

Teaching-Learning Environment: Types and Modes of using ICT - Learning Environments -

Features of an ICT Mediated Teaching-Learning Environment - Physical Constituents of

Classroom/Environment - Social Constituents - Supporting Learners in learning

Introduction:

This Unit intends to acquaint you with various types of classroom environments where ICT can be used. . This Unit discusses in details about the physical arrangements of classroom and also the social constituents of an ICT mediated teaching-learning environment. As a teacher, you can select the appropriate ICTs to mediate teaching-learning environment in order to achieve the objectives of teaching. This Unit will also discuss how you can use a variety of ICT tools and techniques depending upon the nature of content, their access and availability at your place and the way they can be integrated in the teaching learning process.

TEACHING-LEARNING ENVIRONMENT

ICT-mediated teaching-learning encourages **learning by doing**. It enhances the learning environment and requires students to develop critical thinking, research and evaluation skills. Children learn best by acting on environments. ICT mediated learning facilitates children's learning.

Components:

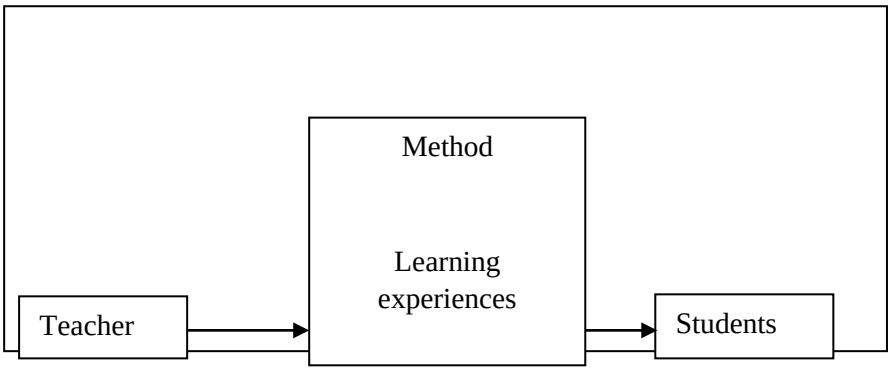
The components which constitute teaching-learning environment are:

(a) Content or learning experiences;

(b) Teacher or provider of learning experiences;

(c) Learner or receiver of learning experiences

(d) Methods and ICTs to provide learning experiences.



Teaching-Learning Environment In a formal teaching-learning environment, the teacher transacts learning experiences through a systematic instructional planning and delivery. Transaction of learning experience means

transaction of a given content. In order to transact a given content, a teacher takes the help of some methods.

For example, a teacher makes use of methods and techniques like lecture, demonstration, discussion, narration, question-answer, seminar, panel discussion, project work, etc.

Types of Learning:

There are different types of teaching-learning environment these environments are

- Face-to-face teaching-learning environment
- Networked teaching-learning environment
- Open and distance teaching-learning environment
- Virtual teaching-learning environment

i) Face-to-Face teaching –learning environment:

Face-to-face teaching-learning environment refers to teaching-learning environment in which the transaction of learning experiences takes place between the teacher and the learners on a face-to-face basis. In informal face-to-face learning environment, learning experiences take place unstructured environments like home, religious places, market places, etc. All the characteristics of formal education system like rigid and fixed time schedule, pre-decided curricular and co-curricular experiences, fixed entry requirements, structured and resource intensive delivery system, assessment of achievement of learning experiences are associated with face-to-face teaching-learning environment. In formal face-to-face learning environment, structured environment created by society in formal educational institutions like schools, colleges and universities to impart education to its future members. The teacher uses a host of ICTs in face-to-face teaching-learning environment. Chalkboard is the most used teaching-learning aid in face-to-face classroom learning environment. It provides the teacher with an opportunity

to create verbal and visual messages in the classroom. If properly developed, the words, graphics and visuals on a chalkboard can contribute immensely to student learning

ii) Networked Teaching-Learning Environment

Networked teaching-learning environment refers to the teaching-learning environment, which is created by network technologies like telephone, computer, mobile, etc. Telephone Network is an essential component of audio conferencing and interactive radio counselling. Indira Gandhi National Open University (IGNOU) utilizes telephone network for providing learning inputs to its students through Interactive Radio Counselling, and audio conferencing. Telephone is very effective medium for the following functions:

- Activating motivation
- Directing attention
- Stimulating recall of relevant requisites
- Providing learning guidance
- Providing feedback

iii) Open and distance teaching-learning environment

Open and distance learning environment refers to the teaching-learning environment where learners learn through open and distance learning system (ODLS). . Open education is a structural device to reduce rigidities and consciously increase openness and flexibilities of the educational system. The term 'Open education' also implies open access to learning regardless of previous qualifications or age of the learner. In India, National Institute of Open Schooling (NIOS) and State Open Schools provide school education to a large number of learners through their wide network. The major technologies, which are used in ODLS, are print materials, audio video programmes, broadcast, telecast,

teleconferencing, online learning, mobile learning or m-learning. Print materials are the main stay of distance teaching learning system. Distance learners are provided with well-designed self-learning materials, which they study at their own place and according to their convenience.

Virtual teaching-learning environment

Virtual teaching-learning environment means learning situation available through ICT resembling classroom or campus study facilities on the Internet. The students need not travel to the physical campus to attend lectures, seminars, and workshops and procure learning materials. The development of this concept is the end result of researches in design science and is used on the conceptual metaphor of architectural design. The physical campus has buildings, classrooms, conferencing places, libraries, laboratories and other infrastructure. The teaching learning activities are carried out through teacher-cantered as well as learner-centred activities with provision of study materials. The virtual teaching-learning environment has all these provisions of learning. The functions and behaviour of real campus-based teaching learning model is replicated through virtual teaching-learning environment.

The virtual teaching-learning environment is used to:

- augment traditional lecture-based teaching with online learning materials and communication.
- support project work that follows face-to-face teaching-learning programme.
- provide distance learning with all interactivity and materials available online.

MODES OF USING ICT IN TEACHING-LEARNING ENVIRONMENTS

There are various modes of using ICT in teaching learning environment. The following three are the most commonly used modes

- ICT mediated Classroom Teaching-Learning

- Blended Learning
- Online learning ICT Mediated Classroom Teaching-learning

i) ICT mediated Classroom Teaching-Learning

An ICT mediated classroom is like a traditional classroom, where a teacher uses various ICT tools and techniques to facilitate learning but the major mode of delivery remains face-to-face teaching by teacher. ICTs like Audio/Video, Computers, CDs or DVDs, Simulations, resources available on the Internet, etc. can be used as teaching-learning materials to support face-to-face teaching. For example, if a teacher is teaching metallurgy in the class, s/he can use a video available in the video library of school or online on YouTube to help learners understand various metallurgical processes. Most teachers in Indian schools use various ICTs as teaching-learning material by integrating them in their classroom teaching. They help teachers explain various concepts and processes as well as learners understand these concepts and processes.

Blended Learning:

Blended learning is a mode in which a teacher combines "face-to-face teaching or activity-based learning in classroom, outdoor, community and workplace settings and computer-based or online learning" etc. Blended is such a comprehensive term that it can include various things in it. Sometimes blended learning is also viewed as a combination of face-to-face learning and Open and Distance learning.

Online Learning

Online learning is a mode of delivery through which a learner can learn the course without going to a college or a university by using Internet based technology. In online learning, all operations from admission to examination are carried out online. The main focus remains on content delivery, interaction between learner and expert (teacher), continuous assessment and feedback on

learner performance. All these activities take place at one online platform, commonly known as a Learning Management System (LMS).

Advantage:

- Learner learns whatever they want
- Learners learn as per their convenience.
- Learner learns at their own pace
- Learner learns in cost effective manner
- Learner learns beyond boundaries

FEATURES OF AN ICT-MEDIATED TEACHONG LEARNING ENVIRONMENT

In the previous two sub-sections, various types of teaching-learning environments and their features have been discussed. In this sub-section, the focus of discussion is on features of an ICT mediated teaching-learning environment. It has six basic dimensions of an ICT mediated teaching learning environment. These are as follows:

Information modality:

This dimension refers to the ability of the available technology in an ICT mediated teaching-learning environment to transmit verbal or non-verbal information.

Linearity:

This dimension talks about the technologies which can be used to transmit the information in a linear as well as non-linear way in the environment.

Type of interaction:

What kind of interaction is being facilitated in an ICT mediated teaching-learning environment constitutes an important dimension. An effective ICT mediated teaching-learning environment facilitates all types of interaction i.e. human-human (learner-teacher, teacher-teacher, learner teacher) as well as human-machine interaction.

Number of participants:

As per the availability of resources in an ICT mediated teaching-learning environment, the number of participants in a session is also an important issue. It depends upon the technology in the institution as well as learners and teachers. The interaction through ICT- 13 ICT Mediated Teaching learning Environment mediated teaching-learning can be one-alone, one-to-many, and many-to many.

Time/place dependency:

It talks about the ability of the technology to transmit information at different times and places. It may be synchronous or asynchronous or both.

- **Immediacy:**

In an ICT mediated teaching-learning environment, the amount of time for sending a message and getting a response to this message is improving day by day with advancement in technologies and their convergence. Activity 2 Indentify and enlist the technologies which can facilitate you in an ICT mediated learning environment. Examine each technology on all six dimensions discussed above and prepare a report.

PHYSICAL CONSTITUENTS OF CLASSROOM/ENVIRONMENT

If a teacher has to create a classroom environment, which can facilitate ICT mediated learning, s/he should know the physical constituents which she/he has to arrange and manage in the classroom. An ICT mediated classroom environment

requires not only the basic infrastructural changes in terms of equipment, layout and seating arrangements in the classroom, but also proper placement of the digital and non-digital technologies in the classroom. Let us discuss physical constituents of classroom in brief.

Basic Infrastructural Requirements

In a classroom where a teacher uses ICTs to facilitate teaching learning, e are some basic infrastructural requirements, without which, it may not be possible to use any ICT. Let us observe a few pictures of classroom, where ICT is being used. National Policy of ICT in School Education (2012) has suggested some basic infrastructural requirements. This policy document has categorized ICT Infrastructure in two categories:

i) Core ICT Infrastructure

ii) Enabling Infrastructure

iii) Core ICT Infrastructure

Hardware:

National Policy of ICT in School Education (2012) has suggested that each state will establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools. Not more than two students will work at a computer access point at a given time. At least one printer, scanner, projector, digital camera, audio recorders and such other devices will be part of the infrastructure.

Fig. 2.1: A Few Pictures of ICT Enabled Classroom

Each school will be equipped with at least one computer laboratory with at least 10 networked computer access points to begin with. Each laboratory will have a maximum of 20 access points, accommodating 40 students at a time. The ratio of total number of access points to the population of the school will be regulated to ensure optimal access to all students and teachers. In composite schools, exclusive laboratories with appropriate hardware and software will be provided for the secondary as well as higher secondary classes. In addition, at least one classroom will be equipped with appropriate audiovisual facilities to support an ICT enabled teaching-learning. Appropriate hardware for Satellite terminals will be provided to selected schools in a progressive manner. Computer access points with Internet connectivity will be provided at the library, teachers' common room and the school head's office to realize the proposed objectives of automated school management and professional development activities. ICT enabled education can be significantly enhanced and the range of classroom practices expanded with the introduction of digital devices like still and video cameras, music and audio devices, digital microscopes and telescopes, digital probes for investigation of various physical parameters. These will also form a part of the infrastructure. States will make appropriate choices and promote the use of such devices in classrooms.

Network and Connectivity:

All computers in the school will be part of a single local area network to enable optimum sharing of resources. In addition to the laboratory, Internet connections will also be provided at the library, teachers' common room and the school head's

office. Each school will be serviced with broadband connectivity capable of receiving streaming audio and video, a range of digital learning resources and interactive programs. The number of computers given Internet connectivity will be governed by the available bandwidth, in order to ensure adequate speeds. A mechanism to have offline access to Internet content will be set. Teachers and students will be educated on issues related to the safe use of Internet. Firewalls and other security measures will be implemented to guard the school network against cyber-attacks and misuse of the ICT facilities. Appropriate guidelines for network security will be developed. An EDUSAT network will be planned at each state with interactive terminals (SIT) and receive only terminals (ROT).

Software:

A software environment favouring pedagogy of learning which promotes active learning, participatory and collaborative practices and sharing of knowledge is essential to nurture a creative society. Free and Open Source Software – operating system and software applications will be preferred in order to expand the range of learning, creation and sharing.

A wide variety of software applications and tools, going well beyond an office suite is required to meet the demands of a broad-based ICT literacy and ICT enabled teaching learning program. Graphics and animation, desktop publishing, web designing, databases, and programming tools have the potential of increasing the range of skills and conceptual knowledge of the students and teachers. A judicious mix of software applications will be introduced in schools. Creation and widespread dissemination of software compilations, including specialized software for different subjects, simulations, virtual laboratories, modelling and problem-solving applications will be encouraged. These will be distinct from multimedia packages and digital learning resources.

i) Enabling Infrastructure

The enabling infrastructure required to efficiently maintain the ICT facility will be defined, established and maintained. Regular and regulated supply of electricity, appropriate electrical fixtures, adequate power backup and support, including alternate sources of energy, where needed, will be ensured. Students and teachers will also be trained in the safe use of electrical outlets and fittings.

- Physical facilities like an adequately large room, appropriate lighting and ventilation, durable and economic furniture suitable for optimization of space and long hours of working will be established. Alternate layouts and arrangements facilitating interactions amongst students and with the teacher will be encouraged.

- Adequate safety precautions and rules for use will be established. Each laboratory will be equipped with a portable fire extinguisher and students and teachers trained in its use. An appropriate fire drill will also be implemented.

- All the equipment and resources will be secured from theft and damage. They will also be covered under an appropriate insurance policy against theft and damage.

Layout of the Learning Space

We have already discussed basic infrastructural requirement. Let us shift our discussion now on various layouts of learning space in an ICT mediated classroom. From the discussion above and pictures, you can develop an idea that there are basically two types of ICT mediated classroom. In one, we have single point set-up to facilitate learning like smart classroom, which you can observe in most schools, and in other learners can access the nodes or machines either individually or in groups. Let us look at a few suggested styles of ICT based classroom layout.

Traditional Classroom:

It is a classroom where most of the time teaching-learning takes place through conventional way i.e. by using whiteboard/chalkboard, lecture or

demonstration. ICT can be integrated in traditional teaching-learning environment. For example, a traditional classroom can be equipped with a LCD projector and screen.

Collaborative Group Work:

In such classroom learning environment, arrangements are made to facilitate learners to work in collaboration with each other. Generally, 2 -5 learners work collaboratively on a project or a task. This needs centralized system along with individual machines for all learners.

Source: http://www2.nau.edu/lrm22/learning_spaces/

i) Independent Work:

In such learning environment, arrangements are made to facilitate learners for their individual work. They may or may not interact with each other. Generally, they do not share their works with other learners in such layout.

Source: http://www2.nau.edu/lrm22/learning_spaces/

Conference Style:

In conference style learning environment, there is an opportunity to work individually and share the work collectively with other learners. In such layout, individual machines as well as central machines are arranged in such a way that all learners can interact with each other and share their work outcomes on a common platform or screen with other learners.

Source: http://www2.nau.edu/lrm22/learning_spaces/

V) Teaching Computer Applications:

This layout is very common in computer laboratories of schools. Such arrangement helps in working on individual tasks as well as supervision by mentor/teacher/ instructor. In such setting there are few opportunities for interaction.

Source: http://www2.nau.edu/lrm22/learning_spaces/

9.4.3 Non-digitized and Digitized technology

You will agree with the fact that during the last decade, the focus has shifted from non-digital technologies to digitalization of technologies. Most ICTs which you have used in your student life have been digitalized now.

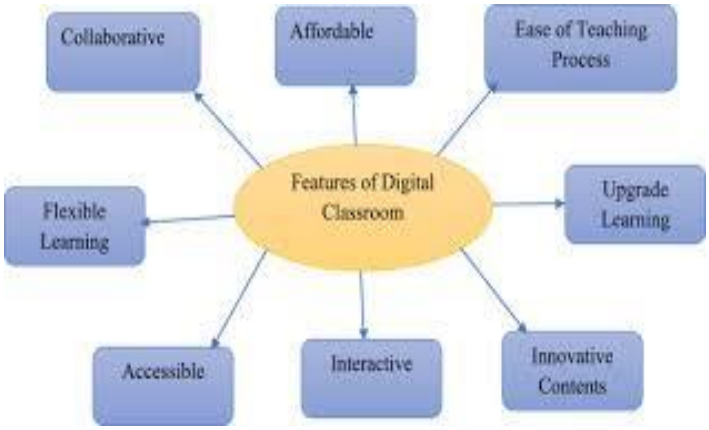
- Earlier the tape recorder or gramophone with magnetic tapes was common for recording the voice. Now a small mp3 file can save the recorded voice. This facility is available in computer, microchip, flash drive or mobile phone.
- Similarly, the photographs on photo films are now can be clicked by using your digital camera or even using virtual storage space through your Internet connected mobile or camera.

- Heavy movie prints or VHS cassettes are being replaced by digital storage devices or virtual memory devised, through which you can access them at anytime from anywhere.

- Television and telecast technology has also changed. Traditional television technology has become digital. Set-top box based direct to home (DTH) satellite based technology has replaced terrestrial based technology.

- You can say, digitization has facilitated the transmission of information in faster way. Internet has become the most important medium of transmission of information. Quality and availability of information have increased and so as the accessibility to information.

- You may do activity 3 in order to understand the shift of technology from nondigital to digital.



SOCIAL CONSTITUENTS

In an ICT mediated classroom, learners learn on their own most of the times. The role of teacher is restricted to a facilitator for learning. But, in such classrooms along with the construction of knowledge, development of life skills also takes place. It is your responsibility to provide such learning environment where learners can develop different social skills too. For successful learning in an ICT mediated classroom, you have to ensure that learners' autonomy prevail, they understand

and acknowledge their responsibilities towards whatever they are doing or learning. There should be enough opportunities for interaction and feedback, which are basically the social constituents of an ICT mediated teaching-learning environment. Let us discuss the social constituents of an ICT mediated teaching - learning environment in brief.

Autonomy and Responsibility

When you think of autonomy of learner in an ICT mediated classroom environment, you can find out various dimensions which facilitate learner's autonomy. Wach (2012) has highlighted the role of computer mediated learning and communication I n developing learner's autonomy. He has suggested that due to natural incorporation of various elements of autonomy, like flexibility in selection of learning material, method of interaction, timing with authentic contexts, assessing their own progress and developing their own meaning, learners develop a sense of autonomy. The dimensions of autonomy in an ICT mediated classroom can be summarized as follows:

- Learners have freedom to choose the learning material as per their own learning styles in an ICT mediated classroom. They can choose the audio or video or online learning or any other interactive medium for learning.
- In an ICT mediated classroom, learners have choice to go for synchronous or asynchronous mode of learning.
- Learners can choose any standardized content or can explore related content which is contextualized and modified as per specific needs based on geographical, cultural, social or professional needs.
- Learners have autonomy to choose the preferred assessment mode. They can go for a tailor-made achievement test, or a performance test, can solve some quiz or participate in an online discussion forum. This flexibility in assessment enhances autonomy.

- Due to autonomy in learning, learners develop their own viewpoints based on their experiences, interactions and exposure to new knowledge.
- Like autonomy, another important social constituent of an ICT mediated classroom environment is responsibility. Responsibility of teacher is to facilitate for authentic and meaningful learning whereas responsibility of learners is to learn. Under the dimension of responsibility, maintaining the equipment is also a responsibility of both teacher and learners. Let us discuss a few aspects, which come under this dimension:
- For ICT mediated learning, high quality, meaningful, and culturally
- Responsive digital content must be available for teachers and learners. (UNESCO, 2002, p. 10). This means the content which is being selected for learning should be culturally responsive. It is the responsibility of a teacher to ensure the availability of such content.
- Development of various social skills and work habits is also a dimension of ICT mediated learning. Learners, in an ICT mediated teaching-learning environment, learn to be responsible, as they perform various tasks on their own. They support the peers and take care of various equipment also.
- ICT mediated teaching-learning environment develops in the learner's responsibility towards learning of others as well as for their own learning. Specially, a collaborative learning set-up helps in developing such skills.
- ICT mediated classroom also helps in developing ethical considerations among learners. It may be ethical use of data or any software. Learners learn to use these having ethical considerations in mind. 20 ICT and Pedagogy Activity 4
- If you are teaching in an ICT mediated teaching-learning environment, enlist dimensions of autonomy and responsibility, which you will ensure with your learners.

Interaction and Feedback

When you think of the nature of interaction in an ICT mediated teaching-learning environment, you may come across with a variety of interactions,

- Interaction between learner and ICT Tool
- Interaction between teacher and learners
- Interaction among learners

As social constituents, we can talk about interaction between teacher and learners, and interaction among learners. If you analyse an ICT mediated teaching-learning environment, you find that interaction is also very often ICT mediated. It is synchronous as well as asynchronous. Let us discuss in brief both synchronous and asynchronous interaction.

Synchronous Interaction

In synchronous teaching-learning environment, learning takes place at a fixed time and schedule. Mostly, teacher and learner interact with each other at the same time by using a variety of ICT tools. Discussions, presentations, chats, etc. take place as mediums of interaction. They take place in real time; therefore, learners and teachers develop a sense of being together and instant feedback is provided. Common interaction tools for synchronous communication are as given below

Chat

Chat is a form of synchronous text-based communication allowing students and the instructor to meet in "real-time" for conversation, discussion forums, question and answer sessions, or virtual office hours.

Advantages:

- Chat offers immediate interaction and feedback from the instructor.

- The immediate connection and ability to collaborate with the instructor and other students can help develop a sense of community for the learner.

Disadvantages:

- Chat requires all students to be good typists. Once a slow typist has responded, the conversation may have progressed to a different concept.
- If the chat group has too many participants, the "conversation can become difficult to follow and disjointed"
- It considered A group of more than five to seven participants is too large

Uses: Use chat when other forms of asynchronous communication are too slow. Common uses for chat include

1. Real-time question and answer sessions
2. Brainstorming, troubleshooting, and problem-solving sessions
3. Oral examinations
4. Interviews of experts by learners or researchers
5. Study groups, team meetings, tutoring sessions and private meetings with the instructor.

Skype

Skype's free version enables one to make voice calls, video calls, send instant messages or chat, and send SMS (Short Message Service) text messages. Skype basically turns the computer into a telephone using a voice over Internet protocol (VoIP) technology allowing people to communicate from anywhere in the world. A contact list is created when Skype users accept contact requests from other Skype users.

Advantages:

- Skype is a free online collaborative tool.
- "Skype is secure, providing encryption of all communications and engaging anti-virus software to protect the communications"
- Skype allows logs calls, instant messaging, and files sent and received for the instructor's records.

Disadvantages:

Calls to land lines or cell phones are not free.

- The free version allows conferencing from only two sites.
- Skype requires a high speed internet connection. Slower connections may drop the call or provide intermittent service.
- Devices that operate on the same frequency may interfere with a Skype connection such as Bluetooth, routers, cordless phones, and microwave ovens.
- **Skype** recommends that universities set up proxy servers, which can act as filters for user requests and which university officials could use to keep its network computers from becoming relay stations.

Uses:

- Skype is very useful when verbal interaction is required between student and instructor. Activities for Skype include hosting virtual office hours and one-on-one tutoring.
- Students can Skype with each other sharing their experiences and collaborate in project work. Instructors can instant message to colleagues and students.
- It is important to provide students with technical requirements and instructions on how to download and setup a Skype account.

- If the online instructor requires the online student to present over Skype, a trial run is suggested

Getting Started with Skype:

1. To get started with Skype, download the free software and install it.
2. Setup Your Microphone for Skype
    - Select Tools Options
    - Select Audio Settings
    - Select the camera's microphone from the dropdown menu (Microphone/Volume) – first option
3. To place a call, either type in a phone number or click on the name of a person on your list of contacts. Then click the large green phone button titled "Call" or "Video Call." Computer-to-computer calls are clear, although crackling can sometimes be heard in the background and some bits of sound are lost. Those problems are more pronounced when making a call from a computer to a land line or cell phone.
4. In addition to making phone calls, you can also make video phone calls, send instant messages, hold conference calls, and transfer files, including those with pictures, music, and video.

Live streaming

Live streaming the method of data transmission used when someone watches video on the Internet. It is a way to deliver a video file a little bit at a time, often from a remote storage location. By transmitting a few seconds of the file at a time over the internet, client devices do not have to download the entire video before starting to play it.

Live streaming is when the streamed video is sent over the Internet in real time, without first being recorded and stored. Today, TV broadcasts, video game streams, and social media video can all be live-streamed.

Social Networking Sites

Social networking sites (SNS) have become one of the most prominent genres of social software, popularized by Myspace and *Facebook* applications that now each boast hundreds of millions of users. SNSs are individually customized personal online spaces. Users set up profiles to represent themselves online. Profiles contain personal information such as hometown, marital status, hobbies, interests, political and social affiliations, photographs, and videos. This information is shared with preferred 'friends' that have been granted access. Face book was originally created for use by college students to connect and create university communities.The rationale for using social networking in education is that teachers have a responsibility to give students skills in how to cope with virtual relationships and to understand what friendship means in the new social culture that has been created by the Web 2.0 environment.

Advantages:

- SNS's provide a creative outlet for students. Through profiles, students can display their audio, video, and photographic works demonstrating "artistic presentation".
- SNS's can also give a student a sense of belonging by allowing the student to participate in an online community.
- Many SNS's connections lead to face-to-face connections and real friendships.
- Some educators argue SNS's have the power and potential to fundamentally alter the educational system by actively engaging and motivating the learner as opposed to the traditional passive learner as only an observer.

Disadvantages:

Some teachers have viewed students in a negative light with negative consequences after viewing the profile of a student.

SNS's can be addictive as students constantly monitor their site eager for friends to comment on their wall. Also, SNS's offer hundreds of games consuming students interest and time.

Uses:

1. exchange of practical information;
2. exchange of academic information;
3. displays of supplication and/or disengagement;
4. Exchanges of humor and nonsense.

Wikis and collaboration tool

A wiki is an interactive, modifiable, and collaborative website, the contents of which can be edited via web browser; only those granted access can modify site content.Wikis are social networking tools characterized by a high degree of connectivity, providing users the means to collaboratively develop web content. Wikis add powerful collaborative dimensions to the classroom by actively involving learners in their own construction of knowledge. They offer information sharing and collaboration features, acting as cognitive reflection and intensification tools and aiding the construction of meaning through the self-design of knowledge repositories.

ii) Asynchronous Interaction:

Asynchronous Interaction is one type of communication where one person provides information and then other person can gives their response at any time

Tools for Asynchronous Interaction Tool Its Use

Digitalized Course

Course material provided through digital platform Materials like App, websites or online learning platforms like SWAYAM, helps learners go through it at any time and at any place. These are examples of asynchronous interaction in which materials in any form like text, PowerPoint presentations, documents, podcasts or video streaming, can be shared with learners for interaction. This is a common feature with most online learning programmes.

E-mail

The most common and basic medium of interaction and feedback is e-mail. It is used not only in online courses but also in offline courses. E-mail is a great tool of personalized communication between teacher and learners. Teacher can use group mails to reach many learners at a time. It can be used as a tool for asking questions, and receiving materials, updates, reminders, and even assessments.

Discussion Boards

The discussion board is also an important feature of e-learning. This is used by learners and teachers for debates, collaboration, and discussion about course contents. It works as a asynchronous medium as anyone can post any question or reply at any time and others can view it whenever they are online. So is flexibility of timing.

Social Networking

Social networking sites like Face Book Groups have enhanced collaboration and interactions among learners and teachers. Now-a-days, many learning management systems have integrated social networking platforms into the course modules. This has facilitated both learners and teachers remain connected to each

other and updated. Now-a-days, messenger apps also help a lot in collaboration and interaction.

Wikis and Wikis and other collaborative tools have been used Collaborative since long for learning and sharing. These tools have Documents also worked as classroom notes. Such tools facilitate group work by providing you and your peers a central platform to work together and share with each other.

SUPPORTING LEARNERS- USING A VARIETY OF TOOLS AND INSTRUCTIONAL STRATEGIES

Choosing appropriate ICT tool for your learners determines the effectiveness of teaching-learning in an ICT mediated teaching-learning environment. While selecting a tool or strategy in ICT mediated classroom, you can consider the following criteria.

Criteria for Selecting ICT Tool

- Technical Required equipments and specifications,
- ease of use,
- speed of use,
- audio/video input,
- flexibility
- Instructional Interactivity
- integrative capacity,
- learner control,
- learner/teacher attitude
- learners' achievement Organizational Technical maintenance,

- space and time feasibility,
- availability of support system,
- staff development and
- community partnership
- Ethical Technical ethics like licensing,
- user rights,
- permission,
- Open sourcing, etc.

Important suggestion for selection of ICT tool should:

- be activity-based rather than lecture-based.
- draw students into group and co-operative learning, as well as provide for individual growth.
- promote hands-on activities and an applied approach to learning.
- encourage students to question, think, react, reflect, and decide in ways that develop critical-thinking and decision-making skills.
- offer choice and flexibility, as appropriate, to meet needs related to individual aptitudes, abilities, learning styles, multiple intelligences, and interests.
- Based on the above criteria, it is your responsibility to assess every tool or strategy and adopt the appropriate one.

ADAPTING LEARNING ENVIRONMENT TO MAKE CLASSROOM INCLUSIVE

ICT can play a very important role in an inclusive classroom, where you have to deal with diverse learners. ICT tools can help the learners overcome the barriers, which act as hindrances in their learning. It has highlighted the importance of ICT in an inclusive classroom.UNESCO suggested the following for making an ICT mediated inclusive classroom

- Maximize use of accessibility features in currently available technologies.
- Facilitate students to 'self-accommodate' by learning the computer features that best suit their needs.
- The potential of new developments and near-future technologies as a means of addressing current barriers should be monitored and exploited.
- Create an inclusive and positive attitude towards the use of technology for learning. • Teacher training and support is critical.
- There should be provision of training and on-going support required for effective ICT usage.
- An inclusive curriculum means considering students' diverse learning needs from the earliest stages of curriculum development.
- Accessible ICTs is a key consideration for national and regional policies.
- The use of accessible ICTs needs to be an integrated part of a school's ICTs plan.
- While working on the above recommendation, you have to identify the assistive technologies which can facilitate learning in an inclusive learning environment.

UNIT 3

ICT AND TEACHING LEARNING PROCESS

ICT and Teaching and learning Process - Need for ICT Selection - Factors affecting ICT

Selection - Selection of ICT - Integration of ICT – TPACK – E- learning, Web based learning,

MOOC - Educational e-resources.

ICT and teaching learning process

Teaching learning is the process of providing a conclude environment consisting of various components with which interact and gain experience leading to the attainment of certain free specified learning outcomes.

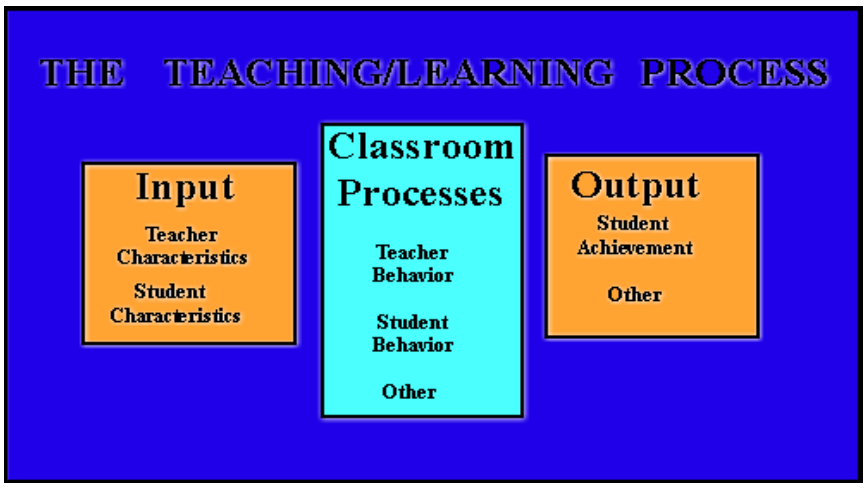
Components

The components which constitute teaching learning environment are

- content and learning experience
- teacher or provider of learning experience
- methods and ICT which are means of providing learning experience
- learner is also a part of the teaching learning environment

Learning process

The following figure which shows how learning take place



The main aim of carrying out any teaching learning activities to provide new learning experience to the learners to carry out those activities that picture decides planning objectives identify planning experience based on the content translate this planet experience in a teaching learning environment and asses the attention of learning outcomes by teacher transaction of Learning experience means translation of a given content teacher take the help of some methods these methods maybe teacher control learner control or group controlled

For example

- Demonstration has a teacher-controlled method
- CAL project work library work on example of learner control method
- debate discussion seminar panel discussion drying storming are the example of group control method

The learning experience us provided through ICTs does becomes mediated experience Begum mediated experience each ICT is effective for specific planning task and with specific learner or group the various icts make different types of learning task is easier.

ICTs are needed at school level for the following activities

- Teaching and learning
- Diagnostic testing and remedial teaching
- Psychological analysis of Learners
- Development of reasoning and thinking abilities among student's
- instructional material development

ICT in teaching learning process

ICT may be of great use in achieving various objectives of teaching- learning process .it provides correct information in a comprehensive manner with different examples. It helps learner to broaden their information base. ICT provide variety in the presentation of content which helps learners to learn according to their own pace. It helps in better understanding on and long retention of information.

ICT for diagnostic testing and remedial teaching

- ICT can help the teachers as well as students in identifying the problem area test can be made available on the website of the school and students can access them from home also.
- ICT can be used for developing preparing and delivery individual remedial program these programs may be online or offline.
- the instruction materials if designed specifically for meeting the individual needs of students and all uploaded on this School website would definitely benefit the students

ICT in evaluation

There are several ICT technologies available to assist teachers in assessing student performance. With the advent of ICT, the nature of teaching, learning, and assessment has changed. Television, computers, iPods, learning management

systems (LMS), virtual reality, social networking sites, online education, online digital repositories, and other ICTs are examples. ICT offers a variety of applications in education that help students develop the skills and competencies they need to thrive in the job and live a fulfilling life.

Importance of ICT in Evaluating Children's Performance

Children can participate in customized testing circumstances while using ICT-enabled exams. In such cases, learning proceeds at the same rate as the individual taking exams.

- The ICT-integrated assessment gives pupils rapid feedback.
- Children's confidence is increased by technology-enabled evaluation since they receive rapid feedback on their learning.
- The evaluation may be set up so that children receive quick feedback and can therefore repair their mistakes and go forward.
- The frequency of assessment could be increased, which would benefit children and keep them engaged in their studies.
- It piques learners' attention and motivates them as they try various technology-assisted assessments.
- Technology-assisted testing/assessment procedures are inexpensive and straightforward to use.

Use of ICT in Various Types of Assessment and Evaluation

Evaluation is an essential component of teaching-learning. It allows you to assess children's instructional activities and to learn achievement. Traditional assessment methods include paper and pencil tests, unit and term-end examinations, and oral questioning procedures. However, the rise of ICT has had an impact on evaluation methodologies. A simple example would be keeping track

of children's grades on an excel spreadsheet. Previously, children's grades were recorded on paper sheets, but today, application software such as Microsoft Excel is utilized.

ICT in assessment has two dimensions: technology as a tool and technology as an aiding medium. Let us look at two accessible instances. A student utilizing a video camera to record the teaching session is an example of using technology as a tool while analysing the recorded video is an example of using technology to aid with evaluation. Before proceeding, please review the illustration, which will assist you in differentiating the various sorts of examinations. As teachers, we are concerned about using ICT in many sorts of evaluation.

ICT in psychological testing:

Schools do not have a trained psychologist who can assess students on some of the correlates of academic achievement. It is easy to digitalize all psychological test including the scoring process and evaluation. Even student can use it individually and can share the results with the teacher who can help him/ her to improve his/her academic performance. Thus ICT can be used in psychological test.

ICT for developing reasoning and thinking abilities:

ICT provides students a variety of Instructional materials and they can choose those that suit them the best. ICT can be used for developing reasoning and thinking abilities among the students belonging to different age groups. This is important in the present context as most educational institutions do not pay attention to development of reasoning and thinking abilities among students

ICT for developing Instructional Material

- By utilizing technology such as interactive whiteboards, collaborative software, and other digital resources, teachers can create engaging and stimulating learning experiences for students. Additionally, these

technologies can help make more complex topics easier to understand by providing visuals and audio feedback.

- TLM integrated with ICT includes e-journals, e-Books, e- research reports, e-lecture modules and notes, slides etc. The ICT tools are as powerful as they are capable of bringing a change and reform the traditional forms of learning.

- Visual resources such as videos, images or PDF documents that can be used as a further aid for students to understand the syllabus even better. LMS: these are educational tools designed to facilitate the interaction and organization of the class group. It makes effective, participatory and enjoyable teaching-learning process.

NEED OF ICT SELECTION

ICT selection is an important part of teaching learning design and delivery. but it is very difficult on the part of a teacher to judge which medium out of the available media is the best for the given instructional task. A teacher therefore takes into consideration various factors which affect ICT selection for the transaction of learning experiences.

The factors affecting ICT selection

There are many factors as well as approaches to selecting ICTs. A simplest approach the use of whatever ICTs available with a teacher he or she can pick up any of these available ICT for carrying out of teaching learning activity. But sometimes it is felt that some ICTs are inappropriate for some learning objectives that means we reject these icts and select others which are appropriate for our learning objective. These approaches called selection by rejection.

All these factors which contribute to the ICT selection maybe categories into the following

- pedagogical utility
- human factors
- availability and accessibility
- user friendly
- cost
- effective communication infrastructure facilities
- time
- hardware

Pedagogic Utility

This factor is concerned with two aspects. At first the learning objectives to be achieved at the end of the teaching learning process second learning experiences based on contents to be provided during the teaching learning process Learning objectives has three domains of blooms taxonomy objectives these are

- cognitive domain
- affective domain
- psychomotor domain
- **Cognitive domain**

  Cognitive domain which includes the following tools of

  - drawing chart, maps, flip chart
  - model, real object, simulator

- PPT slide, film strips
- Individualized instruction
- TV and CCTV
- Radio and 7th video
- Teleconferencing
- Computer conferencing
- M-Learning

- **Affective Domain**

Some instruction materials which describe the affective domain such as

- TV, film
- video tape
- audio tape
- telecast and broadcast
- PPT slide /sound
- computer simulation
- telephone teaching
- audio video conferencing
- Computer conference.

Psychomotor domain

Psychomotor domain development of psychomotor skills and skill coordination which include the following instruction materials such as

- audio tape
- film language laboratory
- computer simulation / animation
- audio and video conference
- M-learning

HUMAN FACTORS

Human factors are related to the selection of ICTs are the teacher who uses ICTs for teaching purposes and the learner who uses for learning purposes.

Teacher's factor:

Some teachers are very comfortable with certain ICTs, while they find difficulty in others.

Learner factor:

Learner factor also plays a great role in ICT selection. Learners even bring to teaching-learning situation a set of capabilities for learning. Learners may interact in many ways to influence the choice of ICT.

Availability and Accessibility

Availability and Accessibility to both teachers and learners are important consideration for ICT selection. Whenever a teacher decides to use any ICT for teaching –learning purposes, he/she should consider their availability both inside and outside the institution. In schools, the resource centres are equipped with various ICT resources. Sometimes

certain ICTs may not be available to a teacher. In such situations, the teacher can look for substitution.

Accessibility

Available ICT should be accessible to the users. Accessibility means that the teacher is able to access the ICTs for teaching purpose and learner for learning purpose.

User friendliness Control and Interactivity

ICTs should be easy to operate and handle by their users. The users namely teacher, learners must have control over ICTs. Suppose a learner is receiving messages transmitted through an audio tape or through PPT slides. The learner can adjust the speed of reading according to his/her needs, or stop the presentation, repeat it again. The teacher can make use of ICTs like audio, video, computer programmes in his/ her teaching and control them according to the requirements during teaching.

Interactivity

Interactivity means the ability of the learner to respond to ICTs and obtain feedback on the response. This enhances students learning to a great context.

There are two kinds of interactivity

- **Learning material interactivity**
- This means learner interacts with ICT, gets feedback from it and the ICT accommodates learners own input and Direction

Social interactivity

- Learners interact with teachers and each/ other through network.

- Cost

Cost or affordability is an important consideration in ICT selection. The learning objective for learning task may be achieved with the help of alternative ICTs.

Capital cost

Capital costs are expenditure the institution incurs for the establishment of either studio or computing network or obtaining necessary hardware equipment.

Production cost:

These costs are related to the production of teaching-learning material. Production cost varies from one teaching material to another.

Recurrent costs:

These costs are required to maintain and manage ICTs.

Variable Costs:

These costs are linked with the increase and decrease in the use of ICTs.

Effective Communication

Effective Communication is the most important factor in the process of ICT selection. While selecting any ICT, one has to look into the fact that the ICT selected is able to communicate the intended message or information effectively.

Infrastructure facilities:

Use of ICTs for teaching- learning activities require adequate infrastructure facilities. Infrastructures facilities like chair, table, and

electric supply etc. All these facilities are available in the ICT resource room.

Time:

Time is a great factor in the selection of ICT. There is a fixed time for any class which may range from 35 minutes to one hour. But there is no restriction for selecting time for better presentation.

Hardware

ICT hardware's are in the form of electronic gadgets. The ICT selected should be safe and durable. They should also be compatible with existing equipment.

Selection of ICT

Various factors which are considered while selecting ICTs for the teaching –learning purposes. The following steps involved in the selection of ICTs. There are six steps in the selection of ICTs. These are

- Select the content to be taught
- Write learning objective
- Determine the domain in which the learning objective can be classified
- Cognitive
- Affective
- Psychomotor
- Consider various factors affecting ICT selection
- Consider various methods/Techniques to be adopted

- Select appropriate ICTs

Select the content to be taught

The first step in the selection of ICT is to select the content from a subject.

Example

If you are teaching geography at the secondary level, we can select the topic on "Natural Resources".

Writing a Learning Objective

The second selection of ICT is to write a learning objective. A good learning objective has four characteristics

- Describe the learner performance
- Observe the learners behaviours
- Conditions of the behaviour
- It defines whether or not the objective has been attained

Example:

A trainee will be able to type out 40 words per minute without any mistake.

Learner Performs- Typing out

Observable behaviours- Typing out

Conditions –without any mistake

Standard- 40 words per minute

Clarification:

Once you have specified or written the objective, you determine the domain in which the objective can be classified. In this example belongs to psycho motor domain as the trainee is expected to type 40 words per minute.

Various methods to be adopted

ICT teaching tools include simulation, modelling, CD-ROMs, teacher web publishing, word processing, spreadsheets, data logging, databases, e-mail, smart boards, interactive whiteboards and Internet browsing. Other Types of teaching methods are differentiated instruction, lecture-based instruction, technology-based learning, group learning, individual learning, inquiry-based learning, kinesthetic learning, game-based learning and expeditionary learning etc.

Select the appropriate ICT

By utilizing technology such as interactive whiteboards, collaborative software, and other digital resources, teachers can create engaging and stimulating learning experiences for students. Additionally, these technologies can help make more complex topics easier to understand by providing visuals and audio feedback.

Integration of ICT

The integration of ICT in education is when you as the classroom teachers use ICT to introduce, reinforce, extend, enrich, assess, and remediate student mastery of curricular targets.

Example:

Integrating simple technologies Power Points, games, internet homework assignments, or online grading systems can be difference makers in students' growth in the classroom.

- Power Points and Games.
- Internet Homework Assignments.
- Online grading Systems.
- Classroom Tablets.
- Listserv.
- Keeping students engage

Role of Teacher in Technology-Enabled Assessment and Evaluation(TPACK)

Teachers are critical in determining the technologies used to assess students' success. Technology may be used for evaluation and assessment because assessment is a component of the evaluation. Paper and pencil examinations were popular in the past, but today, various technological instruments have been recognized and developed to make testing more accessible and enjoyable for youngsters. So, whether it is evaluation or assessment, the teacher's inventiveness and expertise in leveraging technology are essential. At this level, instructors might benefit significantly from a framework known as Technological Pedagogical Content Knowledge (TPACK). The framework summarises each teacher's unique and combined expertise in technology, pedagogy, and content. TPACK is a teacher knowledge foundation for technology integration. Within the context of TPACK, teacher knowledge is characterized as a complex interaction and intersection of three bodies of knowledge: content, pedagogy, and technology. TPACK is one of the foundations for selecting and integrating technology in evaluating children's performance. Thus, your responsibility in technology-based evaluation is to test using numerous technologies. Using the TPACK framework, which includes judgements on technology-based evaluation, would be simple. Let us look at how the TPACK idea is used in the assessment.

Online and E-examination

Online examinations are conducted in an internet setting, whereas exams can be conducted using any digital resources. For example, an LMS platform such as MOODLE requires an online connection, and the evaluation takes place in an internet environment. At the same time, the LMS platform and eXe software (a website for developing online material) work both offline and online. As a result, the evaluation in eXe is more of an electronic evaluation. As the name implies, online tests take place in an internet setting and are typically administered via computers. While e-exams may be administered using any digital device, the ubiquitous usage of intent technologies has opened up new options for engaging assessment via digital apps. Similarly, online and e-exams are becoming increasingly popular in the educational industry. The following aspects should be included in online and e-exams.

E-Learning:

History of e-learning

In 1924, the first testing machine was invented. This device allowed students to test themselves. Then, in 1954, BF Skinner, a Harvard Professor, invented the "teaching machine", which enabled schools to administer programmed instruction to their students. It wasn't until 1960 however that the first computer-based training program was introduced to the world. This computer-based training program (or CBT program) was known as PLATO-Programmed Logic for Automated Teaching Operations. It was originally designed for students attending the University of Illinois, but ended up being used in schools throughout the area.

The first online learning systems were really only set up to deliver information to students but as we entered the 70s online learning started to become more interactive. In Britain, the Open University was keen to take advantage of e-learning. Their system of education has always been primarily focused on learning at a distance. In the past, course materials were delivered by post and correspondence with tutors was via mail. With the internet, the Open

University began to offer a wider range of interactive educational experiences as well as faster correspondence with students via email etc.

With the introduction of the computer and internet in the late 20th century, e-learning tools and delivery methods expanded. The first MAC in the 1980's enabled individuals to have computers in their homes, making it easier for them to learn about particular subjects and develop certain skill sets. Then, in the following decade, virtual learning environments began to truly thrive, with people gaining access to a wealth of online information and e-learning opportunities.

By the early 90s, several schools had been set up that delivered courses online only, making the most of the internet and bringing education to people who wouldn't previously have been able to attend a college due to geographical or time constraints. Technological advancements also helped educational establishments reduce the costs of distance learning, a saving that would also be passed on to the students – helping bring education to a wider audience.

In the 2000's, businesses began using e-learning to train their employees. New and experienced workers alike now had the opportunity to improve upon their industry knowledge base and expand their skill sets. At home, individuals were granted access to programs that offered them the ability to earn online degrees and enrich their lives through expanded knowledge.

In November 1999, Elliott Masie coined the word "eLearning" at his Teheran Conference at Disneyworld. It was the first time that the term was used in a professional context. Others in the industry have already used the term "online learning," which basically points to the same concept

Definition

A learning system based on formalized teaching but with the help of electronic resources is known as E-learning. While teaching can be based in or out

of the classrooms, the use of computers and the Internet forms the major component of E-learning.

Characteristics of e-Learning

- E-learning is Learner-centric Learning:
- Remote teacher learner interaction
- E-learning for lifelong learning:
- E-learning is flexible learning
- E-communication
- Multimedia nature
- Course material
- Just in-time learning
- Learners active participation
- Multiple collaboration
- E-learning Involves effective communications

Approaches to e-learning

E-learning has a lot of definitions, possibly because there isn't a single type of eLearning. A general definition shows the "learning" made by means of WEB technologies, or through an preinstalled software in a computer with multimedia capacity, either in an Asynchrony way (separated student and source on time: auto formation), or in a synchronic way (connected student and source in real time, a "virtual

class ").Traditionally distance education has been asynchrony (teacher and students learning in different places and in different times). The newness introduced with information and communication technologies (TIC) has brought the possibility of developing a synchronic formation, in which teachers and students listen, read and can be seen, independently if they are in different places. E-learning is an auto-assisted learning system. The student will be able to assimilate knowledge, which "is dictated" by a program, by means of a computer. The student feels more comfortable and can repeat the lesson all the times he needed it.

Synchronous e-learning

Synchronous learning refers to all types of learning in which learner(s) and instructor(s) are in the same place, at the same time, in order for learning to take place. This includes in-person classes, live online meetings when the whole class or smaller groups get together. Some examples of synchronous learning include: Live webinars. Video conferencing. Virtual classrooms.

Asynchronous e-learning

Asynchronous learning allows you to learn on your own schedule, within a certain timeframe. You can access and complete lectures, readings, homework and other learning materials at any time during a one- or two-week period.

Example

Watching pre-recorded lecture videos or lessons. Viewing video demonstrations. Reading and writing assignments. Research projects

There are two types of asynchronous courses: ones that are completely self-paced and ones that include deadlines. All asynchronous

learning leverages on-demand, virtual resources. Even synchronous courses that require learners to show up to lectures and complete assignments by a deadline, often include asynchronous elements.

Five of benefits of asynchronous learning:

1. Asynchronous learning gives you more time to review concepts.
2. Asynchronous learning kick-starts in-course conversations.
3. Asynchronous learning makes content more digestible.
4. Asynchronous learning expands your network by providing content to more participants
5. Learning asynchronously grants you access to a wider selection of instructors and experts.

Web based Learning

Web based learning is a way to learn, using web-based technologies or tools in a learning process. Web based learning is associated with learning materials delivered in a web browser, including when the materials are packaged on CD-ROM or other media. Web based education encompasses all aspects and process of education, that use World Wide Web as a communication medium and supporting technology. The online education, virtual education, internet based education, education via computer mediated communication, tele learning, distance learning, collaboration etc. Are considered to be the web based learning.

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Contact with Instructors

Working on the web offers an opportunity to communicate with students using e-mail,

discussion boards etc. Teachers receive students' work quickly and they provide

timely feedback to students' questions. Teachers are overloaded with students and

their contacts. Students may feel isolated from the instructor and classmates.

Instructor may not always be available when students are studying or need help.

Use of technology

When you learn to use one browser and certain software, you will probably be able

to use other browsers and software as well. Some of the software and web browsers are

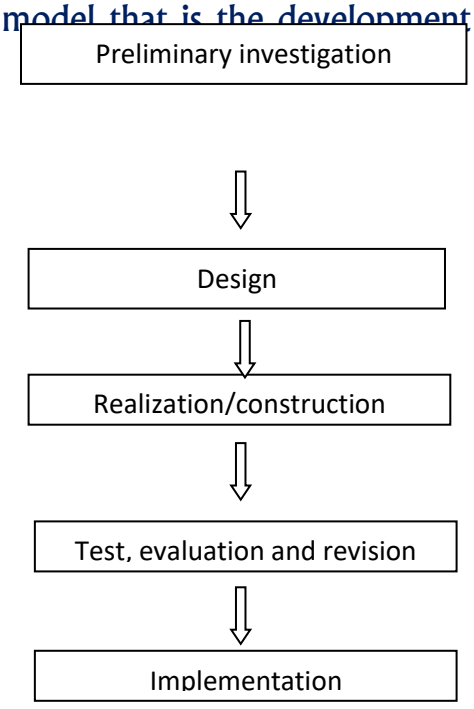
free of charge on the internet. Web-based learning develops knowledge of the Internet and computer skills that help learners throughout their lives and careers.

Managing computer files and online learning software can be complex for students with beginner-level computer skills. Poor usability may cause troubles with navigation, computers crash or have viruses, impossible to send mails.

Software and access to the Internet and e- mail is not free all the time

Models of Web based learning

The Web Base Learning model is developed based on the educational development model that is the development model of Plomp which consists of 5 (five) phases:



- preliminary investigation,

- design,
- realization / construction,
- test, evaluation and revision,
- Implementation.

1) **Preliminary investigation**

An important element in the design process is defining the problem. Investigation of key elements is to collect and analyse information, problem definition and follow-up plans of the project.

2) **Design**

The activities in this phase aim to design the problem solving proposed in the initial investigative phase. The activity characteristics in this phase are

- generalizations of all parts of the solution,
- comparing and evaluating of the various
- alternatives, and yielding the best design
- Choices to use as part of the solution.

3) **Realization/construction**

Design is a work plan to be realized in order to obtain a solution in the phase of realization / construction. Design is a written plan or work plan that's end with production or construction activities.

4) **Test, evaluation and revision**

Evaluation is the process of collecting, processing and analysing information systematically, to obtain the realization value of the solution. Based on the collected data can be determined which solutions are satisfactory and which ones still need to be developed.

5) **Implementation**

After evaluation and obtained valid, practical, and effective product; then the product can be implemented for a wider area. In other words, it must be implemented. This implementation can be done by conducting further research on the use of product development on a wider area.

ASSURE MODEL

ASSURE model is a step-by-step planning guide for selecting and utilizing instructional media. This model was born based on the assumption. In this model, there are six steps that are "blueprints" or lesson plans that serve to describe the lesson plan itself. Here are the six steps, which are accompanied by an explanation of each step abbreviation of assure model namely,

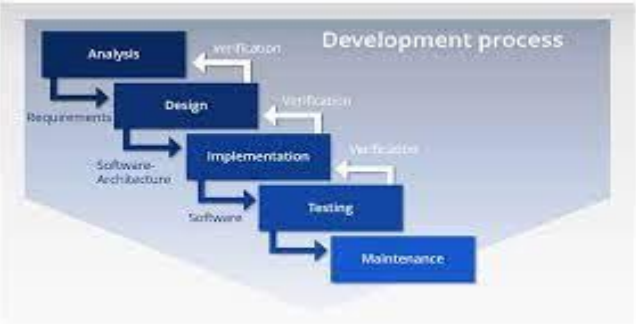
- Analyse the learners characteristic
- State performance objective
- Select methods, media, and materials
- Utilize materials
- Requires learner participation
- Evaluation and revision

The ASSURE model is a learning model that combines media and technology in creating the desired process and learning activity. If media and learning technologies are used effectively, there must be a match between student characteristics and the content of methods, media, and learning materials.

3.9.2 WATERFALL MODEL:

Waterfall is an approach to software development process. First introduced by WinstonRoyce in 1970. This approach is a simple classical approach with a linear system flow.

In detail the activities of each phase are described as follows:



Analysis

At this stage, we need to analyse the needs of the WBL system in detail in terms of service, limitations and objectives made by considering theories, concepts and consultations with the use of the WBL system of lecturers.

Design

The system design is to define the needs of both hardware and software systems that

Build the overall WBL system architecture. These needs are created or logically

Designed which in the next stage will be translated into the programming language.

Coding

At this stage the translation of the design into the form of machine language is done Mechanically as a set of programs and program units.

Testing

Program units or models that have been translated into programming languages are Tested as a complete system to ensure that software requirements are met. After testing

Independently, the system is also tested by the system user.

Maintenance

This stage is the longest stage in the lifecycle. The system is installed and used

Practically. Maintenance includes improving the implementation of system units and

Improving system services when new needs arise.

Features of Web based learning

Flexibility and time

- Training may occur anytime, anyplace that there is Internet access.
- Individuals can learn at their own pace and around their own schedules within a given training time frame.
- Individuals gain access to colleagues and experts from geographic locations with whom they would ordinarily not have the opportunity to communicate.
- Individuals are able to take advantage of lifelong learning without relocating or quitting their jobs.

Learning and understanding

- Individuals must think, respond, problem solve, use critical reasoning, interact and be creative to fully participate in WBT.
- Individuals may feel more in control of their own learning, thus possibly taking on more responsibility.
- Individuals gain access to real-world examples, databases, experts and additional sources of information online.
- Individuals are able to reflect in greater depth on responses to questions or activities posed in training before making their answers and opinions public to other participants.
- WBT emphasizes a learner-centered approach to training versus simply logging the number of hours spent in training.

Cross-platform and varied software

- Individuals may be positively challenged by actively navigating the online environment and learning new technologies.

- Training may be accessed on several computer platforms, including Windows, Macintosh and UNIX.
- Training may be accessed using many of the common Web browsers, including Netscape Navigator, Internet Explorer, America Online, Lynx and other free proprietary software.

Cost

- Overall training costs are often cheaper for participants due to eliminating travel and facilities fees.
- WBT is less expensive when considering the districtwide and worldwide distribution of training, in relation to the limited number of participants in a traditional classroom environment.
- WBT can be easily updated and "recycled" for additional training at a nominal fee.

Accessibility and equal opportunity for all

- The standardized nature of WBT equalizes delivery of the materials for all individuals.
- Opportunities to attend training are created for individuals with disabilities and others who may be excluded due to time, geography or mobility.
- Multimedia such as graphics, video and audio can enhance learning and understanding, as well as be adapted to individuals with various learning styles.
- Individual characteristics such as physical disabilities remain anonymous to other participants, thus eliminating judgments and stigmas often associated with particular disabilities.

Advantages and disadvantages of web-based learning

Web-based learning has both advantages and disadvantages. When comparing them, one can notice that the same factors can be advantages as well as disadvantages depending on the context. Below some factors are described.

Factor	Advantages	Disadvantages
Learning theories and approaches	New learning theories and approaches enable to learn and teach in a more effective way. Students can experience a sense of equality. Course work and challenging assignments are stimulating for knowledge building.	Teachers and learners have to adopt new learning theories and approaches. Role changes of teachers and learners may cause frustration and confusion. Without the common structures of a traditional class, students may feel lost or confused about course activities and deadlines.
Independent and learner centred learning	Students can work at their own pace, when they want. Web-based learning enables to study more deeply areas of interest. It encourages exploring material on your own and enables to skip over materials already mastered. Web-based learning supports personalised learning and is self-directed. It builds self-knowledge and self-confidence	Learners who are not self-motivated, self-directed and independent are not able to plan their own learning and may have problems. Material and assignment instructions might be too complicated to understand independently. Some of the students may lose motivation without certain deadlines. Independent learning requires

	and encourages students to take responsibility for their own learning.	certain skills: technological, communication skills, self-motivation and effective study habits.
Flexibility	Web-based learning enables to join discussions at any hour and encourages also those who don't like to speak. It facilitates learning through a variety of activities. Learners have access to courses, which enables to reduce travel time and costs.	Learners with low motivation or bad study habits may fall behind. They may have difficulties in organizing their learning.
Interaction	Web-based learning provides interaction between students and instructors. Students can share their ideas with other students, which may help to understand the material better.	Prohibits those who are not active learners in a group. Human contact is missing as interaction is relied on electronic communication.
Access to material	Students can study anywhere and anytime if they have an access to computer and Internet. Web-based learning provides continual and also direct access to materials, resources in many different formats and of good quality.	Problems with technology might prevent the access: low speed connection, difficulties to download information, problems with communication tools. Some courses and materials might be out of date. There may be lack of quality control.

Contact with instructors	Working on the web offers an opportunity to communicate with students using e-mail, discussion boards etc. Teachers receive students' work quickly and they provide timely feedback to students' questions.	Teachers are overloaded with students and their contacts. Students may feel isolated from the instructor and classmates. Instructor may not always be available when students are studying or need help.
Use of technology	When you learn to use one browser and certain software, you will probably be able to use other browsers and software as well. Some of the software and web browsers are free of charge on the internet. Web-based learning develops knowledge of the Internet and computer skills that help learners throughout their lives and careers.	Managing computer files and online learning software can be complex for students with beginner-level computer skills. Poor usability may cause troubles with navigation, computers crash or have viruses, impossible to send mails. Software and access to the Internet and e-mail is not free all the time

MOOC Awareness

A massive open online course (MOOC) is a free web-based distance learning program that is designed for large numbers of geographically dispersed students. A MOOC may be patterned on a college or university course or be less structured.

Aim of MOOC

MOOCs provide an affordable and flexible way to learn new skills, advance your career and deliver quality educational experiences at scale. MOOCs are a widely researched development in distance education, first introduced in 2008

Characteristics

- Using Web Formats.

  MOOCs heavily rely on different web formats. ...

- Collaborative Learning.

  One key aspect of MOOCs is their collaborative component. ...

- Assessing Knowledge.

  MOOCs offer tools to assess the transfer and retention of knowledge. ...

- Time Limits.

Benefits:

- By opening the classroom through MOOCs, edX brings the best courses from the best schools to millions of learners around the world.
- The edX platform is built so that teachers can deliver education at scale that is the same or better quality as on-campus learning.
- MOOCs are doing even more to reinvent and reimagine education.
- You can learn from your friends through a social networking site.
- Access to the course is free of cost.
- Material is advocated by top professors.
- Allows you to learn different languages.

- Such courses offer admission to everybody. ...

For example,

- online master's degrees,
- edX's innovative modular credentials
- Micro Masters® programs and Professional Certificate programs
- provide flexible and affordable educational opportunities learners at all stages can leverage to thrive in an increasingly complex and technologically advanced world.

MOOC providers

There are a lot of universities and online platforms offering top quality MOOCs. Here are the most popular ones:

- Coursera
- edX
- Udacity
- Udemy
- Kadenze
- Future Learn
- Swayam

Features

- MOOCs can bring knowledge to students who may not have access otherwise, and be of use to learners who can't afford the costs of higher education.

- MOOCs is a useful form of online learning and can complement traditional university learning.

Educational resources

Educational resources are used in a learning environment to help and assist with people's development and learning. They're designed to reinforce learning and in some cases allow people to put their knowledge to the test. Educational resources are brilliant for teachers and educators to help them deliver the best quality lessons.

Meaning

Educational resources are those resources that the teachers use to help learners to meet the expectations for learning which are defined by the curriculum. They can also be defined as materials used by a teacher to add value to the instructions given by the teacher and to stimulate the interest of the learners present

Importance

Educational resources are crucial for both teachers and students. It is a part of the teaching-learning strategy and provides teachers with valuable information on various topics. It keeps them updated with relevant information and helps in their professional development.

Teachers need to update their knowledge from time to time because the quality of teachers is the most important factor in determining the effectiveness of school systems. Teachers can use various learning materials, for example, some schools provide institution-specific learning resources for teachers. Examples of such resources include inclusion policy documents, assessment procedures, or information for new teachers. Other schools have a collection of books and journals on the professional development of teachers. Teachers can use these

resources to know how they can improve themselves and contribute to the learning process of their students. In addition, online resources are also available for teachers.

In addition to books and journals, new teachers can also learn a lot from experienced teachers. Expert educators are also considered valuable learning resources for new teachers. Moreover, teachers can also learn from their students if they are open to reflective teaching. They can use students' feedback to improve their knowledge and teaching skills.

Selecting Educational Resources

Teachers use the educational resources available online and offline to expand their knowledge base and add to their existing skills. Moreover, they may develop new resources. To select the best resources, teachers need to consider the points mentioned below:

- Use the existing resources as they are
- Adapt it to suit the requirements
- Replace it with more valuable resources

Teachers can use the educational resources for their benefit, or they can recommend these materials to other teachers. Also, they can use it in a training or workshop, or as a part of mentoring processes.

Organize the Educational resources

Developing a system to store and retrieve the learning materials is a good idea. Teachers can store the offline learning resources in files. Likewise, online learning materials can be downloaded and stored on an electronic device.

Various OER Initiatives

Open Educational Resources: Concept

United Nations Educational, Scientific and Cultural Organisation (UNESCO) website reveals that the Open Educational Resources (OER) are teaching, learning and research materials in any medium – digital or otherwise – that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. (Open Educational Resources (OER), 2017). The website also reveals that the term OER first emerged in 2002.

Definition

"Open Educational Resources are digitised materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research."

OER is said to include:

• Learning Content: Full courses, courseware, content modules, learning objects, collections and journals.

• Tools: Software to support the development, use, re-use and delivery of learning content including searching and organization of content, content and learning management systems, content development tools, and on-line learning communities.

• Implementation Resources: Intellectual property licenses to promote open publishing of materials, design principles of best practice, and localization of content.

Open Educational Resources Challenges

The main challenges to implement the OER are the question of intellectual property, the digital divide, and sustainability. Digital Divide many of the countries in the world still have the problem of low connectivity to the internet, but India is not facing this, but many time Indian faces the low bandwidth of the internet due

to which the OER often get slowly downloaded and may cause irritation to the leaners

Open Educational Resources Initiative in India There are several initiatives, both governmental and nongovernmental open educational resources in India

NPTEL:

When talking about the OER initiatives in India, the name of NPTEL comes first. The National Programme on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. (Nptel, online courses and certification, Learn for free, n.d.) The project has been funded by the Ministry of Human Resource Development, Government of India. It is the largest online repository in the world of courses in engineering, basic sciences and selected humanities and social sciences subjects. IITs (Indian Institute of Technology) are the premier institutes in India offering mainly the Technical degrees to the enrolled students, as the seats are limited and many are not able to get enrolled in the IIT hence the NPTEL provides a platform to the learners who are interested to learn the art of technology by the expert of IIT, i.e. the professors of IIT. It is now possible for anyone outside the IIT System to be able to do an online certification course from NPTEL and get a certificate from the IITs. IITs are reaching out and taking education to the homes of people through this initiative. (Nptel, online courses and certification, Learn for free, n.d.) These courses are open for anyone to access – at no cost. So anyone interested in learning gets access to quality content, which also includes a discussion with the content creator and access to assignments for self-testing.

SWAYAM:

SWAYAM is a programme initiated by the Government of India and designed to achieve the three cardinal principles of Education Policy viz., access,

equity and quality.. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

IGNOU'S E-GYANKOSH:

Indira Gandhi National Open University is the largest Open University in India, providing education to its learners through the open mode of learning. EGYANKOSH is an archive of various text study material of all the courses run by it, which are freely available to all.

SAKSHAT:

Sakshat integrates all the contents developed under the Mission and also provides Mission related information and to facilitate public scrutiny, feedback and transparency for the projects undertaken by the Mission.

SWAYAM PRABHA:

The SWAYAM PRABHA is a group of 32 DTH channels devoted to telecasting of high-quality educational programmes on 24X7 basis using the GSAT-15 satellite. NPTEL, IITs, UGC, CEC, IGNOU, NCERT and NIOS. The INFLIBNET Centre maintains the web portal.

CONSORTIUM FOR EDUCATIONAL COMMUNICATION:

The Consortium for Educational Communication popularly known as CEC is one of the Inter University Centres set up by the University Grants Commission of India. It has been established with the goal of addressing the needs of Higher Education through the use of powerful medium of Television alongwith the appropriate use of emerging Information Communication Technology (ICT).

NATIONAL DIGITAL LIBRARY OF INDIA:

Ministry of Human Resource Development (MHRD) under its National Mission on Education through Information and Communication Technology (NMEICT) has initiated the National Digital Library of India (NDL India) pilot project to develop a framework of virtual repository of learning resources with a single-window search facility. Filtered and federated searching is employed to facilitate focused searching so that learners can find out the right resource with least effort and in minimum time. NDL India is designed to hold content of any language and provides interface support for leading Indian languages. It is being arranged to provide support for all academic levels including researchers and life-long learners, all disciplines, all popular form of access devices and differently-abled learners. It is being developed to help students to prepare for entrance and competitive examination, to enable people to learn and prepare from best practices from all over the world and to facilitate researchers to perform inter-linked exploration from multiple sources. The pilot project is devising a framework that is being scaled up with respect to content volume and diversity to serve all levels and disciplines of learners. It is being developed at Indian Institute of Technology Kharagpur. (National Digital Library of India, n.d.)

National Repository of Open Educational Resources (NROER):

NROER Initiated by the Department of School Education and Literacy, Ministry of Human Resource Development, Government of India and managed by the Central Institute of Educational Technology, National Council of Educational Research and Training, the Repository runs on the Meta Studio platform, an initiative of the Knowledge Labs, Homi Bhabha Centre for Science Education. NROER is working on initiatives to bring together all digital resources across all stages of school education and teacher education. It hosts several educational contents, audio, video, text, animations of each level of school education primary, secondary and senior secondary in several Indian language.

NCERT:

National Council of Educational Research and Training (NCERT) is the autonomous organization set by Government of India to assist and advise the central as well as state governments regarding the school education, it also publishes the model school textbooks and is playing other related roles to make the quality school education possible in India. The online service of NCERT offers easy access to the NCERT textbooks. The service covers textbooks of all subjects published by NCERT for classes I to XII in Hindi, English and Urdu. The Entire book or individual chapters can be downloaded provided the terms of use as mentioned in the Copyright Notice is adhered to.

KOER

The Karnataka Open Educational Resources (KOER) portal is an OER repository with collaborative resource creation by the teachers, of the teachers and for the teachers from Karnataka. The portal seeks to bring together teachers, students, schools and institutions in Karnataka to share their experiences and resources. The KOER is also available in Kannada.

UNIT 4

ICT FOR EDUCATIONAL MANAGEMENT AND ASSESSMENT

Definition – e-governance – importance of ICT in manpower planning and HRD – Applications of ICT in Educational Management – Use of ICT in financial management –Creating online community of Parents, Teachers and students for Effective management – TQM and applications of ICT in TQM - Concept and meaning of Computerized Test construction and Administration – Role of ICT in Assessment – Web based Assessment – Electronic support as a tool in assessment

process – Use of Blogs for assessment – Advantages and Disadvantages of ICT based assessment.

Introduction

ICT offers numerous opportunities for change in various school-related processes, including teaching, learning, and administration. Schools must take advantage of these opportunities to implement sweeping infrastructure changes and enhance the skillsets required of teachers and administrative personnel to manage school operations. ICT provides tools for addressing school system issues. ICT plays an indispensable role in enhancing the overall effectiveness of the educational system. Today, schools equipped with ICT are aptly referred to as "Smart Schools." In this unit, we will examine how ICT and its tools can assist educators and administrators in enhancing and streamlining their management system and its many activities.

E-governance

Definition

E-Governance is technology-driven governance for the delivery of government services, the exchange of information and communication transactions, and the integration of diverse systems and services between the government and its citizens. E-governance in the education sector permits the use of information and communication technologies to enhance education, enhance information and service delivery, promote student participation in the decision-making process, and make administration transparent and efficient.

Educational Management:

Educational management is the administration of the education system in which a group combines human and material resources to supervise, plan, and implement strategies and structures to carry out an education system. The education system is comprised of political leaders, principals, teaching staff, non-teaching staff, administrative staff, and other educational professionals who work

collaboratively to enrich and improve the system. Management of the educational ecosystem is required at all levels. Administration involves five functions

- Planning
- Determining Future Planning
- Assurance of human and non-human assets
- Implementation
- Review\sEvaluation\sintegration

Importance of ICT in manpower planning and HRD

ICT play an important role in manpower planning and HRD because they enable the school administration to share knowledge and data. It also expedites the integration of administrative functions and ensures a modern approach to administration, resulting in quicker administrative transactions. It provides newer and more effective strategies for mitigating some of the challenges facing the nation's educational system. ICT plays a crucial role in enhancing the school system's functional effectiveness. In this post, we will discuss the role of ICT in educational management and the ways in which ICT can assist school administrators in improving various administrative tasks.

FOR TEACHERS:

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educational management and the ways in which ICT can aid school administrators in enhancing various administrative tasks.

TO SCHOOL ADMINISTRATION:

- ICT facilitates communication and collaboration among students, instructors, administrators, and parents.
- It also enables school administrators to share information in a secure manner 24 hours a day, seven days a week, and ultimately gain access to a world of knowledge beyond the classroom.
- ICT provides educational administrators with the opportunity to transform how learning occurs and facilitate student growth.
- ICT facilitates educational administration tasks, including data storage, knowledge management, and decision-making.
- ICT reduces inefficiency in operations.
- How does ICT enhance the quality of administrative services?
- It improves the performance of educational administrators by simplifying work processes and internal operations through internal computerization and automation, thereby fostering transparency and accountability.

4. ICT IS USED AS A TOOLS FOR CONNECTING WITH PARENTS

- ICT enables schools to create and distribute classroom newsletters via email to keep parents abreast of school activities.
- ICT enables the creation of a school website where parents can access information about their children's educational progress.
- It allows parents to read and respond to e-mails from their children's school at their convenience.

- ICT enables parents to provide rapid feedback through online surveys.
- Schools use ICT to communicate with parents by sharing videos about school programmes.
- ICT enables communication with parents through social networks such as Facebook, Twitter, and MSN. Parents are able to communicate with one another regarding their children's class. They are able to share photographs, vital information, etc.
- ICT enables the School to send SMS and Instant Messaging to parents when the student is absent, such as via Messenger, Whatsapp, etc.
- Easy Access to Learning is one of the most vital contributions of ICT to the field of education.

Students can now access e-books, sample examination papers, previous year papers, etc., as well as resource persons, mentors, experts, researchers, professionals, and peers from around the globe. This flexibility has increased the availability of just-in-time learning and provided many more learners who were previously constrained by other obligations with learning opportunities (Young, 2002). ICT-enabled dissemination of education's most effective practises and course materials can improve instruction. ICT also enables academic institutions to reach disadvantaged groups and new educational markets abroad.

Application of ICT in Educational Management

Information and communication technology is redefining the way in which students are educated. It makes the learning process more efficient and effective for both students and teachers. ICT tools in education facilitate the use of the most effective strategies to bring out the best in students.

- ICT is utilised in the majority of fields, including E-Commerce, E-government, banking, agriculture, education, medicine, defence, and transportation, among others.
- E-Commerce
- E-Commerce focuses on the use of ICT to facilitate business activities and customer relationships. Business to Business (B2B) refers to e-commerce transactions between two businesses, such as between a manufacturer and a wholesaler or a wholesaler and a retailer.
- E-governance can be defined as the application of information and communication technology (ICT) to provide government services, information exchange, transactions, integration of previously offered services, and information portals.
- Banking
- ICT enables banks to provide enhanced customer service via ATMs, internet banking, telephone banking, and 24-hour services.
- Agriculture
- The data allows farmers and agribusinesses to closely monitor crop cultivation, optimise the use of agrochemicals and natural resources, and quickly adapt to shifting environmental conditions. The application of precision agriculture and ICTs has increased productivity and decreased expenses.
- When teachers are digitally literate and understand how to incorporate ICT into the curriculum, Information and Communications Technology (ICT) can impact student learning. Information is communicated, created, disseminated, stored, and managed using a variety of ICT tools.
- Medicine ICTs have the potential to promote patient-centered healthcare at a lower cost, increase quality care and information sharing, educate health

professionals and patients, stimulate a different type of patient-provider interaction, and reduce travel time.

Defence

This information and communications technology (ICT) strategy ensures that the Department of Defense is equipped to fight and win in the digital age by delivering mission-capable information and communications technology. The strategy defines four objectives. Enable quicker, more effective decisions in the modern battlefield.

Transport

Information and communication technologies (ICTs) play a significant role in transport systems because they provide access to travel information, planning tools, opportunities to share transport modes, to work remotely, to compare transport mode costs, to make payments, to improve safety and health, and to communicate.

Use of ICT in Financial Management

Information technology plays a significant role in financial services for a variety of reasons, but most notably in the exchange of information over electronic networks. Currently, all financial services are based on creating a faster, more efficient service for customers, with a focus on mobile-based options that are more efficient. Since cloud-based technology information is utilised so frequently, the significance of information technology is of the utmost importance.

The role of information technology in finance enables financial institutions to acquire new information at the same rate as their rivals. The impact of information technology on financial services also enables customers to easily complete online transactions, which improves customer confidence in finance, enables the advancement of information technology, and initially creates a faster and more efficient service. Financial reporting is an information technology industry that has

had a significant impact on the financial services sector. Information technology's expanding modernizations have significantly improved the way we utilise financial reports. As stated previously in this article, the importance of computers in finance also improves data storage, file management, and data reporting. In the context of data reporting and analysis, cloud-based services such as Dropbox play tangential roles. Online banking and transactions, as well as mobile payments, are extremely popular in today's culture. Due to the high volume of financial transactions, numerous financial institutions must adopt the most recent security and technology in order to remain relevant. Even though there are a number of risks associated with the use of information technology, there are also a number of benefits associated with its application. There are billions of daily financial transactions; therefore, information technology is ideal for the structure of the financial systems. Existing software tools and computer systems for automation give information technology in finance a great deal of significance.

Creating online community of parents, teachers, and students for effective management

Online community

- It is often stated correctly that the interaction between parents and teachers can contribute to a child's overall development. Therefore, it is crucial that these pillars of student development communicate with one another.
- Sharing school activities with parents not only increases parental awareness and comprehension.
- Relationships between two pillars of a child's growth and development require communication and interaction between school teachers and schools, as well as among parents.

Zone and sphere of communication

The parents' and teachers' or schools' communication zones and spheres are outlined below.

- Parents are expected to provide a safe and healthy learning environment for their children so that they may continue their education beyond the school setting. Schools conduct counselling sessions and workshops to inform parents of the need to create a healthy learning environment at home.
- Periodically, parents must be informed of the school calendar in order for them to be aware of school-sponsored activities and programmes.
- Parents are encouraged to participate in their children's various school activities, such as career talks, and in the improvement of the school's effort to foster the holistic development of children.
- In addition, there are provisions for parental participation in decision-making and school governance.

SMS and Instant Messaging

SMS is abbreviated for short message service. It is a protocol used for sending short messages across wireless networks. Parents are notified via text message of their children's attendance status. This enables the parents to determine whether or not the child is skipping school and/or playing truant. Text messaging and instant messaging are similar because both are used to transmit text messages. However, text messaging ("texting") utilises the cellular phone service, while instant messaging uses the Internet. Instant messages can be longer than text messages, which are typically limited to 160 characters. Teachers, students, and parents are currently embracing instant messaging services like WhatsApp.

Website or blog

A website (also written as a web site) is a collection of web pages and related content that are published on at least one web server and identified by a common

domain name. Typically, websites are devoted to a specific topic or function, such as news, education, commerce, entertainment, or social networking. A blog is a website or page within a larger website. It typically contains articles written in a conversational tone and accompanied by images or videos. Blogging is a flexible and entertaining method of self-expression and social interaction, so it is not surprising that blogs have become so popular.

E-mail services

- An email service is a company that provides businesses with the means to send mass emails and conduct email marketing. Email services provide features that make it simple to manage mailing lists, email design, and success metrics.
- Email service function:
- Fits any organisation.
- Offers helpful tools for email creation.
- Numerous data are gathered.
- Resulting in a high ROI
- Provides a low-cost or complimentary trial
- Sending email is simplified.

LMS:

A learning management system (LMS) is a software application or web-based technology that is utilised to plan, implement, and evaluate a particular learning process. It is used for e-learning practises and, in its most common form, consists of two components: a server that performs the core functionality and an instructor-, student-, and administrator-operated user interface (UI). A typical LMS allows instructors to create and deliver content, monitor student participation, and

evaluate student performance. It may also offer interactive features, such as threaded discussions, video conferencing, and discussion forums, to students. Businesses, government agencies, and traditional and online educational institutions utilise these systems frequently. They can enhance conventional educational practises while saving organisations time and money. An efficient system allows instructors and administrators to manage elements such as user registration and access, content, calendars, communication, quizzes, certifications, and notifications.

The Advanced Distributed Learning group, supported by the U.S. Department of Defense, has created a set of specifications known as the Sharable Content Object Reference Model (SCORM) to encourage the standardisation of LMSs. Popular learning management systems utilised by educational institutions include Moodle, Anthology's Blackboard Learn, and PowerSchool's Schoology Learning. Popular enterprise-level LMSs consist of Adobe Learning Manager, Docebo Learn LMS, eFront, iSpring Learn, and TalentLMS.

VLMS:

A virtual learning environment (VLE) in educational technology is a web-based platform for the digital aspects of courses of study, typically within educational institutions. They present resources, activities, and interactions within a course structure and outline the various stages of evaluation. In addition to reporting on participation and integrating with other institutional systems, Virtual Learning Environments (VLEs) typically provide some level of reporting on participation. In North America, VLEs are typically called Learning Management Systems (LMS)

Components

The following are the primary requirements for virtual learning environments and online education curriculums. Frequently, VLE learning platforms enable:

- Management of content entails the production, storage, accessibility, and utilisation of instructional materials.
- Curriculum mapping and planning – lesson planning, assessment, and personalization of the educational experience
- Learner engagement and administration – controlled access to learner data, resources, and tracking of progress and accomplishment
- Communication and cooperation – emails, notices, chat, wikis, and blogs
- Real time communication – live video conferencing or audio conferencing
- A VLE may contain any or all of the following elements:
- Curriculum outline
- Administrative information about the course, including prerequisites, credits, registration, payments, physical sessions, and contact information for the instructor.
- A bulletin board displaying current course information
- The fundamental content of part or all of the course; the entire course for distance learning applications, or a portion of it when used as a portion of a traditional course. Typically, this consists of lecture copies in the form of text, audio, or video presentations, as well as the visual presentations that support them.

Additional resources, either as links to external resources or as integrated resources. Typically, this consists of additional reading or creative alternatives. Typically, self-evaluation quizzes or similar instruments are automatically graded. Exams, essay submission, and project presentations are examples of formal assessment functions. This now commonly includes elements to facilitate peer

evaluation. Support for communications, such as e-mail, threaded discussions, chat rooms, Twitter, and other media, sometimes with the instructor or an assistant serving as moderator. Wikis, blogs, RSS feeds, and 3D virtual learning spaces are supplementary elements. Links to external resources – the VLE provides links to all other online learning spaces (Virtual Learning Environment). Access rights administration for instructors, their assistants, course support staff, and students. Documentation and statistics pertinent to institution administration and quality control Authoring tools for creating the necessary documents by the instructor and, in most cases, submissions by the students. Allow for the necessary hyperlinks to create a unified presentation for students. Whiteboard online interactive for live virtual classes

A VLE is typically not designed for a specific course or subject, but is capable of supporting multiple courses across the entire academic programme, providing a consistent interface within the institution and, to some extent, with other institutions utilising the system. Through digital means such as e-mail, chat rooms, web 2.0 sites, and forums, the virtual learning environment facilitates the global exchange of information between a user and the educational institution in which he or she is enrolled. Social networks are websites and applications that allow individuals and organisations to connect, communicate, share information, and form relationships. People can connect with those in their area, their families, their friends, and those who share their interests. Today, social networks are one of the most essential Internet applications. A social media application that allows users to create, store, and share multimedia files (photos, videos, sounds) with others. Published in the chapter: Social Media for Small and Medium-Sized Businesses. In Lee (Western Illinois University, USA)

TQM and application of ICT in TQM

Total Quality Management (TQM) is a management approach that seeks to provide long-term success by providing unparalleled customer satisfaction through the constant delivery of quality IT services.

Principles of TQM:

- **Customer first.** TQM's first and foremost pillar of success is an unwavering focus on the customer's experience in all interactions with the organization. From first contact through purchase and continued support, the customer should always be the main priority.
- **Employee ownership.** TQM requires the involvement of every team member to ensure that complete quality control is offered at every level. TQM doesn't focus on a single department because the goal is to provide customers with a great experience from every level of the organization.
- **Process-based.** TQM focuses on the creation and implementation of processes that provide organizations with the ability to find success and repeat it. Quantifying success and defining the steps taken to get there are essential for successful implementation of TQM.
- **System integration.** TQM strategies revolve around leveraging every asset available to the company. This is best achieved through system integrations that combine disparate parts of the organization into a single, well-oiled machine working in complete synergy.
- **Communication.** TQM requires every team member to be at their best and to function as a value-adding member of that team. This means communication and transparency is a core tenet of successful TQM practices.
- **Data-driven.** TQM doesn't employ guesswork. Instead, data is leveraged for the improvement of the organization and decisions are made based on quantifiable facts.
- **Constant improvement.** TQM isn't a one and done process. Perfection is impossible, so it must always be pursued to get the organization as close as possible to it.

These pillars of TQM act as a framework for every decision made within the methodology. Whenever your organization feels lost, the TQM ideals are your guiding stars for righting course.

Implementing TQM:

The first step in implementing any new system is an honest evaluation of the current state of the organisation. There is no step-by-step guide that will tell you how to implement TQM in your business; it must be applied to the organization's current structure. Each business is unique and requires its own approach, but the fundamental tenets of TQM can serve as a compass for all decisions. Then, you can proceed with these potential areas.

Emphasize customer satisfaction

Creating a focus on customer satisfaction will alter how departments view their responsibilities. If what they are doing is not contributing to the enhancement of the product's quality or the enhancement of the customer's experience, they are not moving in the right direction. Each worker should assume responsibility for their position and be willing to consider ways to enhance their own department and outputs.

Communicate with everyone

Communication throughout the organisation is crucial for informing everyone of upcoming changes and providing a channel for receiving feedback. Communication, as the saying goes, is a two-way street. Employees will have a much easier time establishing a sense of ownership over the process if they are aware that their opinions were considered and they had a hand in shaping the changes.

Manage errors

Error management is one of the most important aspects of delivering quality. IT organisations will always encounter problems, regardless of how focused everyone is on quality. TQM success requires the development of processes that mitigate problems. Obviously, errors should be addressed and resolved as soon as possible, but they should also be logged and monitored. Indicative of a deeper problem that necessitates extensive changes to current procedures, recurrent problems may be indicative of a deeper problem. An error is a chance to evaluate a problem, but it is also an opportunity to determine what is working. Total quality management practitioners should view errors as opportunities to learn from their mistakes and devise strategies for preventing them in the future.

Computer-based test

Computer Based Test (CBT) refers to the use of computers as an alternative to traditional pen-and-paper testing. Using the internet or a computer-assisted facility, professionals and industries evaluate and assess a candidate's performance, skill, and capability.

Role of ICT in assessment

The constructivist approach to teaching-learning processes permits instructors to evaluate students with the aid of contemporary information and communication technologies (ICTs). Teachers gather information from the Internet and other ICT resources for instructional purposes. In addition to using computers and other electronic devices for self-learning and expanding their knowledge beyond the current curriculum, children are also utilising these tools for self-education. You must be trained and prepared to use ICT to evaluate student performance in this environment. There are numerous ICT tools available to aid educators in evaluating student performance. ICT provides a variety of applications in education that help students acquire the skills and competencies they need to be successful on the job and live a fulfilling life.

Importance of ICT in Evaluating Children's Performance

Children can participate in customized testing circumstances while using ICT-enabled exams.

- The ICT-integrated assessment provides students with immediate feedback.
- Technology-enabled evaluation increases children's confidence because they receive immediate feedback on their learning.
- The evaluation may be structured so that students receive immediate feedback, allowing them to correct their errors and proceed.
- Increasing the frequency of assessment would benefit children and keep them engaged in their studies.
- It engages and motivates students as they attempt various technology-assisted assessments.
- Technology-assisted testing and evaluation procedures are inexpensive and simple to implement.

Use of ICT in Various Types of Assessment and Evaluation

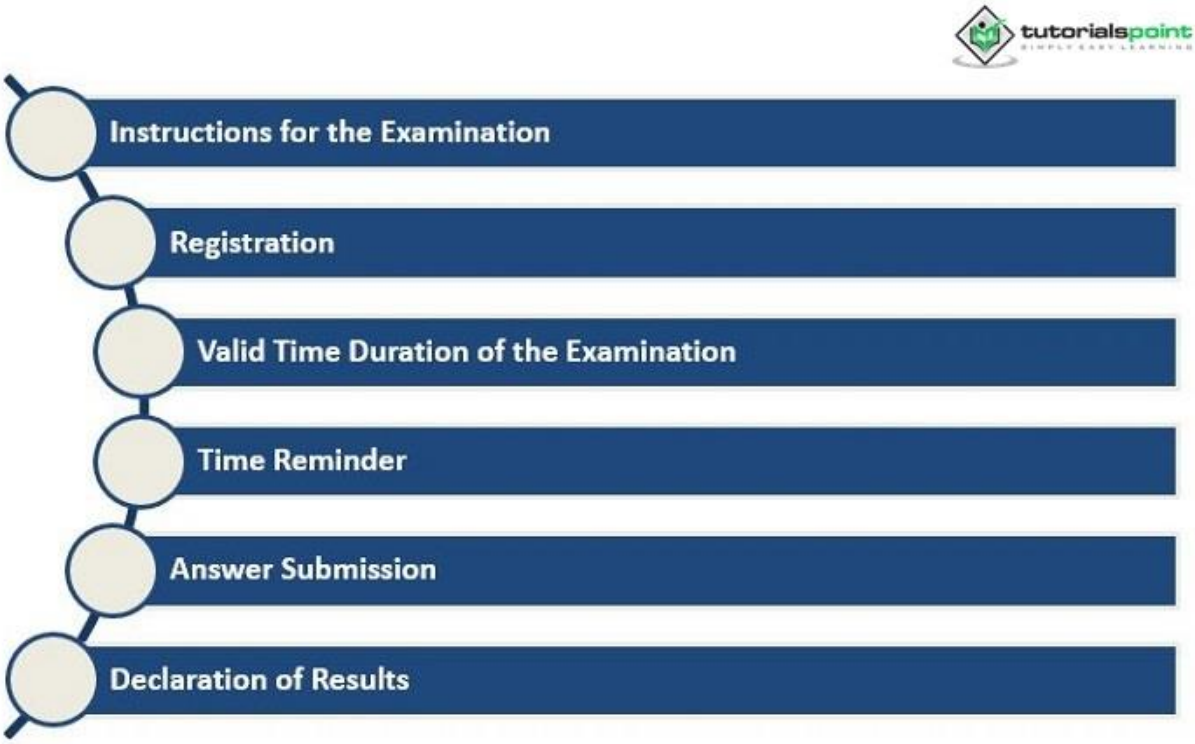
Evaluation is an integral part of teaching and learning. It enables you to evaluate the instructional activities of children and determine their achievement. Traditional evaluation techniques include paper-and-pencil tests, unit and final exams, and oral questioning techniques. Nonetheless, the proliferation of ICT has had an effect on evaluation methodologies. Keeping track of children's grades on an Excel spreadsheet is a simple example. In the past, children's grades were recorded on paper sheets; today, application software such as Microsoft Excel is used. There are two dimensions of ICT in assessment: technology as a tool and technology as an aiding medium. Using a video camera to record a lecture is an example of using technology as a tool, whereas analysing the recorded video is an example of using technology to assist with evaluation.

Role of Teacher in Technology-Enabled Assessment and Evaluation

Teachers play a crucial role in determining the technologies used to evaluate student achievement. Because assessment is a component of the evaluation, technology may be used for evaluation and assessment. At this level, instructors may benefit greatly from the Technological Pedagogical Content Knowledge framework (TPACK). The framework summarises the unique and combined technology, pedagogy, and content expertise of each teacher. TPACK is a foundation of teacher knowledge for technology integration. Within the framework of TPACK, teacher knowledge is defined as a complex interaction and intersection of three bodies of knowledge: content, pedagogy, and technology. TPACK is one of the foundations for selecting and integrating technology when assessing the performance of children. Consequently, your responsibility in technology-based evaluation is to conduct tests with a variety of technologies. Using the TPACK framework, which includes technology-based evaluation judgments, would be straightforward.

Online and E-examination

Online examinations are administered via the Internet, whereas exams may be administered using any digital resources. An LMS platform such as MOODLE, for instance, necessitates an online connection, and the evaluation takes place in an internet-based environment. The LMS platform and eXe software (a website for creating online content) both function offline and online. Consequently, the evaluation in eXe is predominantly electronic. Online tests, as their name suggests, are conducted in an online environment and are typically administered via computer. While e-exams can be administered on any digital device, the pervasive use of intent technologies has created new opportunities for interactive assessment via digital apps. Similarly, online and electronic examinations are gaining popularity in the education industry. The following should be included in online and electronic examinations:



Instructions for the Examination

The time, marks allocated for each section/question, class, style of replying, question type, and so on must be clearly stated.

Registration

Students taking online or e-exams must first register or make an account, where questions to test their knowledge will be provided. Either the test will be provided online, which students may assess by entering their login password, or the examiner will set the questions, which students can only attempt.

Valid Time Duration of the Examination

The examination will be valid for a fixed period, after which it will become inaccessible. This is because the test format is designed so pupils will not have extra time to attempt questions, as in a traditional examination.

Time Reminder

As students proceed through the questions, the system will create alerts regarding the remaining time, questions neglected, half-tried, and so on. These prompts serve as reminders to students to finish their exams on time.

Answer Submission

Students can submit answers as a complete or as a single question at a time. In both circumstances, warning signals would be generated before submitting the response: if the answer is complete, whether they want to amend answers, and so on. This allows pupils to double-check their replies.

Answer Submission

Students may submit responses as a whole or one question at a time. In both cases, warning signals would be generated prior to submitting the response: if the response is complete, if the user wishes to modify their responses, etc. This allows students to verify their answers.

Learners' E-portfolio and E-rubrics

Continuous and comprehensive assessment (CCE) is a school strategy in which students are routinely tested on a variety of factors throughout academic sessions. Performance in the classroom, participation in extracurricular activities, and participation in other school events are routinely evaluated. Consequently, the evaluation is comprehensive and ongoing. Numerous data points about a student are meticulously recorded. Portfolios document the student's learning performance, activities, co-curricular involvement information, and other pertinent information throughout the session. Such a record is quite useful for analysing the student's academic performance throughout their education. E-portfolios have replaced traditional portfolios as we emphasise a digital teaching-learning culture. While learning, children participate in a variety of tasks that are graded to determine their performance. Typically, achievement tests are used to evaluate students. A rubric is a set of criteria used to assess the performance of students. A

rubric is a consistent set of criteria that describes the level of achievement for student work. Consequently, a rubric will consist of a few predetermined criteria and descriptions of varying levels of achievement for those criteria. The rubric is more descriptive in that the to-be-evaluated skills are specified as levels and the student's level for each talent is identified. The degree of performance, despite being descriptive, is used to evaluate an individual's performance. Therefore, the primary purpose of the rubric is to assess performance.

Conclusion

This unit consists of a definition of e-governance and a clear description of the significance of ICT in human resource planning and development. Applications of technology in educational administration, Utilization of ICT in financial management, Creating an online community of Parents, Teachers, and students for management effectiveness TQM and ICT applications in TQM, Concept and significance of Computerized Test Development and Administration, Electronic support as a tool in the assessment process Utilization of Blogs for Assessment and Pros and Cons of ICT-based Assessment

UNIT 5

ARTIFICIAL INTELLIGENCE (AI) IN EDUCATION

Artificial intelligence: Meaning and history – AI integrated education – Principles and objectives of AI integrated learning – Role of schools in the success of AI integrated learning – Meeting of National Goals through AI integration – Assessment of AI integrated learning.

Artificial Intelligence (AI):

Meaning:

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to intelligence displayed by humans or by other animals. "Intelligence" encompasses the ability to learn and to reason, to generalize, and to infer meaning.

History:

The study of mathematical logic led directly to Alan Turing's theory of computation, which proposed that a machine could simulate any conceivable act of mathematical deduction by shuffling symbols as simple as "0" and "1." It is known as the Church–Turing thesis that digital computers can simulate any form of formal reasoning. Together with concurrent discoveries in neurobiology, information theory, and cybernetics, this prompted scientists to consider the possibility of creating an electronic brain. The first work generally acknowledged as AI was McCullough and Pitts' formal design for Turing-complete "artificial neurons" in 1943. In the 1950s, two approaches to achieving artificial intelligence emerged. One vision, known as Symbolic AI or GOFAI, was to create a symbolic representation of the world and world-reasoning systems using computers. The second perspective, known as the connectionist approach, sought to attain intelligence through learning. In 1956, a workshop at Dartmouth College birthed the field of AI research. In the 1960s and 1970s, researchers were convinced that symbolic approaches would eventually be able to create a machine with artificial general intelligence; they viewed this as the ultimate goal of their field. The commercial success of expert systems, a type of AI programme that simulated the knowledge and analytical skills of human experts, revitalised AI research in the early 1980s. A number of researchers started investigating "sub-symbolic" approaches to specific AI issues. Robotics researchers, such as Rodney Brooks, rejected symbolic AI and instead concentrated on the fundamental engineering problems that would enable robots to move, survive, and learn their surroundings. In the late 1990s and early 21st century, AI gradually rehabilitated its image by finding specific solutions to specific problems. Researchers were able to produce verifiable results, utilise more mathematical methods, and collaborate with other

fields (such as statistics, economics, and mathematics) due to the narrow scope. In the 1990s, solutions developed by AI researchers were rarely referred to as "artificial intelligence," but by the year 2000, they were widely employed. In a 2017 survey, one in five businesses reported having "implemented AI in certain offerings or processes." The volume of AI research (as measured by total publications) increased by fifty percent between 2015 and 2019. Numerous academic researchers grew concerned that artificial intelligence was no longer pursuing its original objective of developing adaptable, fully intelligent machines. The majority of current AI research focuses on statistical AI, which is predominantly employed to solve specific problems, including highly effective techniques such as deep learning. This concern has given rise to the subfield of artificial general intelligence (or "AGI"), which by 2010 included a number of well-funded institutions.

Benefits of Artificial Intelligence

- Artificial intelligence is challenging for novices, but it offers excellent opportunities to create intelligent machines that can revolutionise computer science.
- Using intelligent systems, we can reduce human errors and perform various tasks with greater efficiency.
- Intelligent systems can accomplish tasks that are insurmountable for humans. Foreign currency; Explore the ocean and effortlessly complete a variety of difficult, laborious tasks.
- Numerous applications have been created utilising Artificial Intelligence. IPhones, Siri, and Microsoft Crotona are examples of products that have evolved from the phenomenon of artificial intelligence. These are interactive robots that facilitate smartphone access.

- A digital assistant can be created with the aid of artificial intelligence technology, thereby reducing the number of employees. These assistants can perform their duties with remarkable proficiency.
- In the medical field, radiosurgery has been used to treat tumours using artificial intelligence.
- Utilize artificial intelligence to enhance the productivity, efficiency, and precision of your products.

Disadvantages of Artificial Intelligence

- Artificial intelligence is futuristic and appears promising. It is being implemented gradually in numerous areas. There are numerous disadvantages of Artificial Intelligence, which include; Artificial Intelligence is slowly being integrated into real-time applications. AI offers numerous opportunities, but it is extremely expensive. Smaller businesses cannot afford the expensive hardware, software, and resources required to implement artificial intelligence.
- Artificial intelligence systems can perform tasks more efficiently than humans, but they cannot make decisions. Robots are incapable of determining right and wrong.
- With intelligent systems, you will not be inspired by ordinary experience. Humans demonstrate inventiveness through their everyday experiences.
- Replacing humans with intelligent systems can lead to a rise in unemployment and a decline in GDP.

AI Integrated Education:

Artificial Intelligence (AI) integration in the classroom has the potential to revolutionise how students and teachers learn and teach. Students can receive personalised feedback and recommendations from AI algorithms, allowing for a more engaging and effective learning experience.

Role of AI in education

There is four ways AI in education helps improve student outcomes

Personalized learning

AI technology is capable of easily adapting to various learning styles and going a step further. AI technology is capable of analysing students' past performance and modifying lesson plans and adjusting instruction accordingly. When it comes to personalised learning, AI can also assist students in locating relevant resources, data, and other pertinent information. AI is capable of generating individualised study plans for students without requiring the intervention of learning specialists. All the while meeting the overarching objective of making learning easier and enabling students to interact with the material more effectively so that it sticks. From a personalised learning perspective, AI truly shines in its ability to reach students en masse. With overcrowded elementary school classrooms and hundreds of students in postsecondary classrooms, AI can help personalise to all students simultaneously, making it easier for everyone to succeed.

2. Tutoring

AI provides on-demand tutoring without the need for an in-person or live Zoom session. Because AI uses algorithms to adapt, it can quickly shift to support students in the areas where they require the most assistance. AI tutoring systems are quite sophisticated in their ability to target students' areas of strength and improvement in order to enhance their overall education. The primary advantage of AI-based tutoring technology is its capacity to aid students in comprehending complex, sophisticated terms and concepts on a mass scale. Access to AI-based tutoring is no longer restricted to those who can afford it.

Assessments and grading

The use of AI can expedite the assessment and grading process. Moreover, AI technology can evaluate and provide students with feedback on grammar,

content, and vocabulary. By relieving teachers of this responsibility, they are able to focus on other crucial aspects of teaching, such as lesson planning and student engagement. The elimination of human error, biases, and mistakes is one of the greatest benefits of automating assessments and grades. It can also provide each student with a comprehensive breakdown of where they went wrong and how they can improve, without requiring any additional time from the teacher.

Improved student engagement

AI can engage students in educational material and make learning more interesting. Chat Bots are one method by which educators can incorporate AI into the classroom. The capacity of chatbots to personalise and adapt to the learning styles of students creates more opportunities to maintain student engagement. And because Chat Bots can be accessed at any time or place, students can work at their own pace and continue their education outside of traditional class hours.

Three ways AI in education benefits teachers

There is the three ways AI in education is beneficial to teachers.

Predictive analysis

Predictive analytics is a cool and burgeoning AI application in education. AI can analyse data to predict which students may fall through the cracks. Predictive analytics is exciting for educators because it enables them to identify students with learning challenges earlier and provide them with the tools they need to be successful.

Enhanced teaching methods

One application of AI in education is to improve teaching methods. By utilising AI technology, teachers can quickly create games and simulations that help students practise and learn the lessons being taught without having to spend additional time on lesson planning, which is a significant time saver for educators.

Making assessments and grading easier

Using AI technology to improve and accelerate the assessment and grading process is an exciting application of artificial intelligence in education. For instance, assessments can be conducted in real-time as opposed to requiring lengthy home-based marking. Not only does this save teachers time, but it also enhances students' comprehension of the material in real-time, as opposed to retrospectively.

Principles and objectives of AI integrated learning

Based on AI tools three Basic principles are there

Learning

Acquiring and processing the new experience while developing new behavioural models.

Self-correction

Improving the algorithms to ensure the most precise outcomes.

Reasoning

Selecting the specific algorithms required to complete a specific task.

Based on curriculum six key principles are there

- Definition
- relational
- impact (content)
- flexibility
- learning

- communication (process)

Objectives of AI Integrated learning

The global adoption of technology in education is transforming the teaching and learning process. Artificial Intelligence is one of the disruptive technologies used to personalise the learning experience for various groups of students, teachers, and tutors. This is how tools of Artificial Intelligence can be utilised to enhance study processes. The goals of AI Integrated Learning are as follows.

Personalize Education

Artificial Intelligence aids in determining what a student knows and does not know, and then creates a personalised study plan for each student, taking into account their knowledge gaps. In this manner, AI tailors studies to the unique requirements of each student, thereby enhancing their effectiveness.

1. **Produce Smart Content**

   - **Digitallessons**

     Digital learning interfaces with customization options, digital textbooks, study guides, bite-sized lessons, and much more can be generated with the help of AI.

   - **Informationvisualization**

     new ways of perceiving information, such as visualization, simulation, web-based study environments, can be powered by AI.

   - **Learningcontentupdates**

     Besides, AI helps generate and update the content of the lessons, keeping the information up to date and customizing it for different learning curves.

Contribute To Task Automation

Administrative tasks simplification: grading, assessing, and responding to students is a time-consuming task that could be optimised by a teacher using artificial intelligence. AI allows teachers to devote more time to more important tasks, such as grading assignments that cannot be delegated to AI, self-education, and improving the quality of lessons.

Do Tutoring

Personal tutoring and support for students outside of the classroom assists students in keeping up with the course and relieves their parents of the burden of explaining algebra to their children. Teachers save a substantial amount of time with the assistance of AI tutors, as they do not need to spend additional time explaining difficult concepts to students. Students can avoid the embarrassment of asking for additional assistance in front of their peers by utilising AI-powered chatbots or AI virtual personal assistants.

Ensure Access to Education for Students with Special Needs :

Students with learning disabilities have access to new modes of interaction made possible by AI. AI provides access to education for students with special needs, including those who are deaf or hard of hearing, visually impaired, autistic, etc. It is possible to successfully train artificial intelligence tools to assist any group of students with special needs.

Role of schools AI integrated education

The use of artificial intelligence to enhance the educational experience for students and teachers. The following roles for artificial intelligence in education, as well as those that will follow, will shape and define the future educational experience.

1. **Artificial intelligence can automate basic activities in education, like grading.**

AI enables teachers to automate the grading of nearly all multiple-choice and fill-in-the-blank examinations. Today, essay-grading software is advancing, enabling

teachers to devote more time to in-class activities and student interaction than to grading.

2. Educational software can be adapted to student needs.

A growing number of adaptive learning programmes, games, and software will have a significant impact on education at all levels, from kindergarten to graduate school. These systems respond to the needs of the student by emphasising certain topics more, repeating concepts that have not been mastered, and assisting students in working at their own pace. AI supports various types of learning, including machine-assisted learning and adaptive learning, which will improve and broaden students' knowledge.

It can point out places where courses need to improve:

Artificial intelligence offers a solution to this issue. Massive open online course provider Coursera is already implementing this. When a significant number of students submit incorrect homework answers, the system alerts the teacher and provides future students with a customised message that provides hints to the correct answer.

Students could get additional support from AI tutor

There are currently tutoring programmes based on artificial intelligence that can assist students with basic math, writing, and other subjects. These programmes can teach students the basics, but they are not yet ideal for helping students develop higher-order thinking and creativity, which real-life teachers are still required to facilitate.

5. AI-driven programs can give students and educators helpful feedback.

AI can not only assist teachers and students in designing courses tailored to their needs, but it can also provide feedback on the overall success of the course. Some schools, particularly those with online offerings, are employing AI systems to

monitor student progress and alert instructors when there may be a problem with student performance.

6. It is altering how we find and interact with information.

These kinds of intelligent systems play a significant role in how we interact with information in our personal and professional lives, and they may also alter how we locate and utilise information in schools and universities. AI-based systems have already radically altered how we interact with information over the past several decades, and with newer, more integrated technology, future students may have vastly different experiences conducting research and looking up facts than students do today.

7. It could change the role of teachers.

AI will transform the role of teacher into facilitator. Teachers will supplement AI instruction, assist struggling students, and provide human interaction and hands-on experiences. In many ways, technology is already driving some of these changes in the classroom, particularly in online or flipped classroom-oriented schools.

8. AI can make trial-and-error learning less intimidating.

Trial and error is essential to learning, but many students are paralysed by the prospect of failing or not knowing the answer. Some dislike being put on the spot in front of peers or authority figures, such as a teacher. An intelligent computer system designed to help students learn makes trial and error much less intimidating. Artificial intelligence could provide students with a relatively judgment-free environment in which to experiment and learn, especially if AI tutors can offer suggestions for improvement. AI is the ideal format for supporting this type of learning, as AI systems themselves frequently learn through trial and error.

9. Data powered by AI can change how schools find, teach, and support students.

The interaction between colleges and prospective and current students is altering as a result of smart data collection enabled by intelligent computer systems. Intelligent computer systems are helping to tailor every aspect of the college experience to student needs and objectives, from recruitment to helping students choose the best courses.

10. AI may change where students learn, who teaches them, and how they acquire basic skills.

Using AI systems, software, and support, students can learn from anywhere in the world, at any time, and with these types of programmes replacing certain types of classroom instruction, AI may eventually replace teachers in some cases (for better or worse). Educational programmes powered by AI are already assisting students in learning fundamental skills, but as these programmes mature and their developers gain more knowledge, they will likely offer a much broader array of services to students.

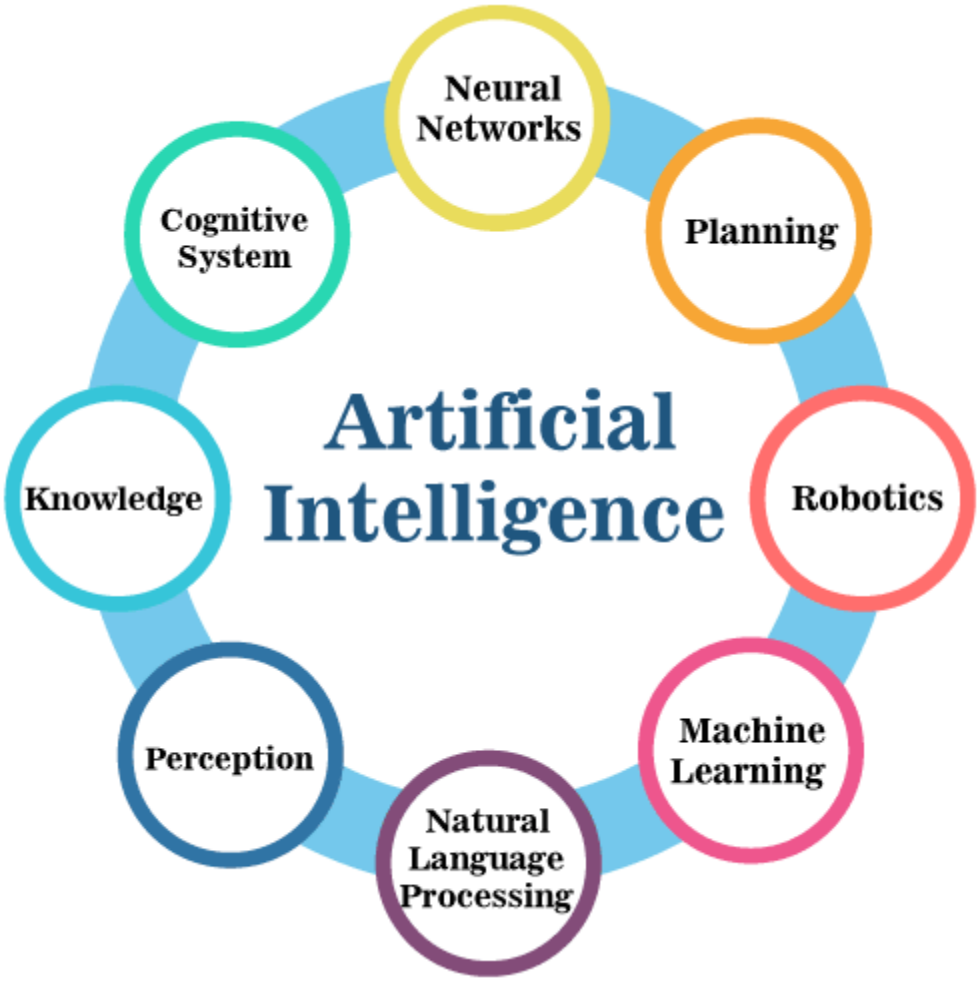
Meeting of National Goals through AI integration

An integral component of India's AI strategy is addressing common and complex global problems that can be resolved through technological intervention, and India's scale and opportunity landscape provides the ideal test-bed to ensure sustainable and scalable solutions. Among the objectives of artificial intelligence are computer-assisted learning, reasoning, and perception. Today, AI is utilised in numerous industries, including finance and healthcare. Weak AI tends to be simple and task-focused, whereas strong AI performs more complex and human-like tasks.

Goals through Artificial Intelligence

By analysing human behaviour and using the results to create intelligent systems, AI can be achieved. For instance, they acquire knowledge, make decisions, and act in specific situations. Observing humans performing simple problem-solving tasks and using the resulting data to create intelligent systems. The primary objective of

artificial intelligence research is to develop intelligent computer and machine technology. Sub-problems comprise the general problem of simulating (or creating) intelligence. The following symptoms receive the most attention. These are specific characteristics or abilities that researchers anticipate intelligent systems to possess. Eric Sandwell emphasises situationally pertinent and applicable planning and learning.



Logic, problem-solving:

Early researchers created algorithms that simulate humans' step-by-step deductive and puzzle-solving reasoning. By the late 1980s and early 1990s, artificial intelligence (AI) research had developed methods for dealing with uncertain or incomplete information using probability and economics concepts. Algorithms may require enormous computational resources for difficult problems;

the majority experience a "combinatorial explosion" in which the amount of memory or computer time required for problems of a certain size becomes astronomical. Priority is placed on the search for more effective problem-solving algorithms.

Knowledge representation:

In AI research, knowledge representation and knowledge engineering play a central role. Many of the problems that are anticipated to be solved by machines will require extensive global knowledge. Objects, properties, categories, and relationships between objects; situations, events, states, and times; Cause and Effect; Knowledge about knowledge (what others know about what we know); and many other, less-researched domains must be represented by artificial intelligence. An ontology is a representation of "what exists"; it is the set of objects, relations, concepts, etc. that the machine knows. Upper ontology, which attempts to provide a foundation for all other knowledge, is the most general.

Planning:

Intelligent agents must be capable of setting and achieving objectives. They must be able to visualise the future - a representation of the current state of the world and predictions of how their actions will affect it - and make decisions that maximise the utility (or "value") of the available options. In classical planning problems, the agent can assume it is the only system acting in the world, allowing it to be certain of its actions' outcomes. Nevertheless, if the agent is not the only actor, the agent must reason under uncertainty. It requires an agent to evaluate its environment, make predictions, evaluate its own predictions, and adapt based on its evaluation.

Learning:

Machine learning, a fundamental concept in AI research since the field's inception, is the study of computer algorithms that improve themselves

automatically through experience. Unsupervised learning is the ability to discover patterns in a stream of input. Classification and regression are both components of supervised learning. Classification is used to determine which category something belongs to after observing multiple examples from multiple categories. Regression aims to develop a function that describes the relationship between inputs and outputs and predicts how outputs should change as inputs change.

Social Intelligence:

Effective computing is the study and design of systems able to detect, interpret, process, and simulate human behaviour. It encompasses computer science, psychology, and cognitive science. While the field's origins can be traced to early philosophical inquiries into emotion, the modern branch of computer science began with Rosalind Picard's 1995 paper on "effective computing."

Creativity:

A subfield of AI addresses creativity from a philosophical and psychological perspective, as well as from a practical standpoint (the specific implementation of systems that produce novel and useful outputs). Artificial intuition and artificial thinking are two related areas of computer science research.

General Intelligence:

Many researchers believe that their work will eventually result in a machine with artificial general intelligence, combining all of the aforementioned abilities and outperforming humans in the majority or all of these domains. Some believe that such a project may necessitate anthropomorphic characteristics, such as an artificial consciousness or brain.

Assessment of AI integrated learning.

Using realistic chatbot-style conversations with candidates, AI can be used to administer situational judgement tests. AI can also analyse a candidate's responses

to test questions and use proven algorithms to make predictions based on the data collected. Hiring managers use AI-driven predictions to make objective hiring decisions regarding the most qualified candidate for the role. A number of technical terms are used to identify the specific applications of AI in evaluations.

Robotic process automation:

RPA is accomplished through the collection and transfer of expert knowledge. Programmatically, RPA tools adhere to a "if/then" rule-based methodology. Unlike more sophisticated AI systems, rule-based systems cannot learn and improve without explicit instructions. RPA technology is used to generate computer-generated interpretative reports for talent evaluation.

Machine learning:

Even though a computer is incapable of independent thought, statistical tools allow a system to model predictions from data. The model can be updated to improve its predictions over time. In data analysis, machine learning is used to create predictive people analytics, which aids employers in making better decisions regarding talent.

Pattern matching:

This artificial intelligence technique employs a computer to examine a sequence of responses for a pattern. It is capable of performing "human" tasks such as recognising faces and identifying emotions.

Natural language processing:

This artificial intelligence technique uses text and speech analytics to extract the underlying meaning of spoken language. In the majority of video interview evaluations, natural language processing is used to analyse speech.

Conclusion:

This unit provides a brief overview of the definition and history of artificial intelligence, AI-integrated education, the principles and objectives of AI-integrated learning, the role of schools in the success of AI-integrated learning, the achievement of national goals through AI integration, and the evaluation of AI-integrated learning. The 21st century is experiencing a time of rapid change. While AI is making our lives easier, it is also expanding its knowledge of human abilities. The future of artificial intelligence appears to consist of a combined human and computer workforce working efficiently and precisely for the benefit of humanity.