Information Communication Technology in Education

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Abstract - In education, ICT plays a crucial role by integrating digital tools into the learning environment, enhancing the teaching and learning experience. Whether it is multimedia presentations, educational apps, or digital textbooks, ICT in education means leveraging technology to improve the delivery and effectiveness of education. Moreover, many people recognize ICTs as catalysts for change; change in working conditions, handling and exchanging information, teaching methods, learning approaches, scientific research, and in accessing information communication technologies. In this digital era, ICT use in the classroom is important for giving students opportunities to learn and apply the required 21st century skills. ICT improves teaching and learning and its importance for teachers in performing their role of creators of pedagogical environments. ICT helps of a teacher to present his teaching attractively and able to learn for the learners at any level of educational programmes. Today in India teaching training programmes making useful and attractive by the term of ICT. Information and Communication Technologies (ICTs) exemplified by the internet and interactive multimedia are obviously an important focus for future education and need to be effectively integrated into formal teaching and learning – especially in a teacher education institution.

Keywords: Communication, Technologies, Education.

Introduction- Technology has disrupted all areas of our life and education is no different. Especially after the pandemic, more schools are looking towards online learning as a permanent teaching method along with traditional classroom teaching. It means we have more opportunities to use ICT in teacher training programmes now days and improve quality of teacher for teach effectively. According to UNESCO "ICT is a scientific, technological and engineering discipline and management technique used in handling information, itsapplication and association with social, economic and cultural matters". Teacher is the main part of the educational field inour society. He more works for theimprovement level of our society in every field. Skilled

teachers can make the creative students in form of the good social worker, politician, poet, philosopher etc.for the society. Teachers can play a friendly role with the learner. The rapid development in technology has made creatively changes in the way we live, as well as the demands of the society. Recognizing the impact of modern technologies on the workplace and everyday life, today's teacher education institutionstry to restructuretheir educationprograms and classroom facilities, to minimize the teaching and learning technology gap between today and the future.

ICT in education management is not only meant to educate students but also teachers. Regular teacher training programme are essential, and ICT helps train them in their own institutes through online learning.With ICT tools, teachers can engage in continuous professional development through online training modules that they can access anytime, ensuring they stay updated without interrupting their teaching responsibilities. This also includes training on how to integrate ICT in the classroom effectively, thereby enhancing teaching outcomes.

Operational definition of terms Information Communication Technologies (ICT) in this review article refers to the computer and internet connections used to handle and communicate information for learning purpose.

E learning: is a learning program that makes use of an information network- such as the internet, an intranet (LAN) or extranet (WAN) whether wholly or in part, for course delivery, interaction and/or facilitation. Web-based learning is a subset of e-learning and refers to learning using an internet browsersuch as the model, blackboardor internet explorer (Tinio, 2002).

Blended Learning: refers to learning models that combines the face-to-face classroom practice with e-learning solutions. For example, a teacher may facilitate student learning in class contact and uses the model (modular object-oriented dynamic learning environment) to facilitate out of class learning.

Constructivism: is a paradigm of learning that assumes learning as a process individuals ''construct'' meaning or new knowledge based on their prior knowledge and experience (Johassen, 1991). Educators also call it the emerging pedagogy in contrast to the long existing behaviourism view of learning.

Learner- centred learning environment isa learning environment that pays attention to knowledge, skills, attitudes, and beliefs that learners bringwith them to the learningprocess where its impetus is derived from a paradigm of learning called constructivism. In the context of this article, it means students personal engagementto the learning task using the computer and or the internet connection.

To effectively harness the power of the new information and communication technologies (ICTs) to improvelearning, the following essential conditions must be met:

•Students and teachers musthave sufficient access to digital technologies and the Internet in their classrooms, schools, and teacher education institutions.High quality, meaningful, and culturally responsive digital content must be available for teachers and learners.

• Teachers must have the knowledge and skills to use the new digital tools and resources to help all students achieve high academic standards. Generation of teachers to effectively use the new learning tools in their teaching practices. For many teachers' educationprogramme. this . uniting task requires the acquisition of new resources, expertise, and careful planning. In approaching this task, it is helpful to understand:

•the impact oftechnology on global society and the implications for education

•The extensive knowledge that has been generated about how people learn and what this means for creating more effective and engaging student-centred learning environments.

• The stages of teacher development and the levels of adoption of ICTs by teachers

• The critical importance of context, culture, leadership and vision, lifelong learning, and the change process in planning for the integration of technology into teacher education

• The ICT competencies required of teachers related to content, pedagogy, technical issues, social issues, collaboration, and networking.

• The importance of developing standards to guide implementation of ICTs in teachereducation

• The essential conditions for successful integration of ICTs into teacher education

• Important strategies to consider in planning for the infusion of ICTs in teacher education and managing the change process.

The document provides a framework for ICTs in teacher education and describes the essential conditions that must be met for successful technology integration. It offers case studies illustrating the variety of approaches that may be used in integrating ICTs into teacher education and provides guidelines for the development of a high-quality strategic technology plan. Lastly, it discusses the importance of planning and managing the change process and building a broad base of support among all stakeholders to achieve the goals of integrating ICTs into the teacher education programme.

Information Communication Technologies in Education

ICT helps to keep pace with the latest developments with the help of different technologies included in it. .www – www stands for world wide web which is one of the most important and widely accepted services (like IRC, E-mail etc.) of the Internet. Its popularity has increased dramatically, simply because it's very easy to use colourful and rich content.

According to Dennis P. Curtin (2002): -

"Web is a series of interconnected documents stored on computer sites or websites".

E-learning– E-learning is also known as online learning. E–learning encompasses learning at all levels both formal and non-formal that uses an information network– the Internet, an intranet (LAN) or extranet (WAN). The components include e-portfolios, cyber infrastructures, digital libraries and online learning object repositories. All the above components create a digital identity of the user and connect all the stakeholders in the education. It also facilitates inter disciplinary research.

Group Discussion – Internet Relay Chat (IRC) is among the popular Internet service people mostly use for live chatting. Group of people with common interest can exchange views / opinions with each other instantly through Internet. Description of the internet technologies required to support education via ICTs (www, video conference, Tele-Conference, Mobile Conference, CD Database, Word-Processor, Intranet, Internet etc.)

E-Modules – Modules written are converted and stored into digital version into a computer using word processor accessible by the user through internet.

Education For Everyone- ICT provides the flexibility and availability of learning materials to all students. While all resources are available in <u>classrooms</u>, students can also access them outside schools. This especially

benefits students who are slow learners or have learning disabilities. Such students can go over the lessons as many times as they need and understand their subjects thoroughly.

The availability of learning resources also benefits students who cannot afford to attend classes every day. For students with financial constraints, low-cost electronic devices specially meant for education are available.

Efficient Teachers Training- ICT in education management is not only meant to educate students but also teachers. Regular teachertrainingprograms are essential, and ICT helps train them in their own institutes through online learning.With ICT tools, teachers can engage in continuous professional development through online training modules that they can access anytime, ensuring they stay updated without interrupting their teaching responsibilities. This also includes training on how to integrate ICT in the classroom effectively, thereby enhancing teaching outcomes.

Higher Knowledge Retention- Visual learning is more effective for students than regular chalk and talk. This is because our brain processes and retains images and videos faster than text. ICT equips audio-visual teaching methods, which boost learners' knowledge retention and interest levels. Additionally, ICT-based teaching allows for interactive learning experiences, such as educational games and virtual lab simulations, which further aid in knowledge retention.

Encourages Collaboration- ICT lets you collaborate with any institute in any part of the world. And students can do so in the comfort of their classrooms. This saves time and resources while giving access to collaborations with some of the best institutes.

Students can collaborate with peers and experts worldwide, without leaving their classrooms. This global connectivity opens opportunities for knowledge exchange, cross-cultural learning, and joint projects with students from different countries. ICT thus broadens the educational experience and prepares students for a connected world.

Improves Transparency- One of the key roles of ICT in education is to streamline administrative tasks, such as attendance tracking and grading. By digitizing these processes, schools can maintain transparent records that are easily accessible to teachers, students, and parents. This transparency ensures that any issues, such as declining grades or absenteeism, are promptly addressed with accurate data.

Data stored using ICT can also serve as proof for any action the institute takes. This eliminates uncomfortable questions and accusations, as all actions are based on proof.

Learner-Cantered Approach- The need for ICT in education is to create a learning environment that focuses on students. ICT tools address the gap between teacher and learner-cantered environments. As ICT gives access to a wide range of information, all students' unique educational requirements are met. Teachers can assess the use of such information through quizzes and exams.

The shift to a learner-cantered approach is one of the significant contributions of ICT in schools. With access to a vast array of resources, teachers can tailor lessons to meet the unique needs of each student. ICT enables the personalization of learning experiences, allowing for differentiated instruction, and ensuring that every student receives the support they need.

New Teaching Methods- ICT is making it possible to adopt new teaching techniques in institutes. One such technique is the "flipped classroom," where students learn their lessons at home and practice them through practical activities in class.

Through ICT, students can effectively learn at home using videos, while at school, ICT engages them in fun learning activities. Teachers can also experiment with different learning techniques and directly check their impact by tracking students' grades through ICT.

Example of ICT tools in Education- The integration of ICT tools in education has become essential for enhancing teaching and learning experiences. Here are some of the key ICT tools that are making a significant impact in classrooms today:

- **Interactive Whiteboards:** These tools allow teachers to display multimedia content, annotate directly on the board, and engage students with interactive lessons.
- **Learning Management Systems (LMS):** LMS platform helps in organizing coursework, tracking student progress, and facilitating online learning.
- **Digital Textbooks and eBooks:** Accessible through tablets or computers, these resources provide interactive and up-to-date content that can be customized to fit the curriculum.
- **Educational Apps:** These tools make learning fun and interactive by turning lessons into games and quizzes.
- **Online Collaboration Platforms:** These tools enable students and teachers to collaborate in real-time, regardless of their physical location.

Teleconferencing

1. Audio – Conferencing – It involves the live (real-time) exchange of voice messages over a telephone network when low – band width text and still images such as graphs, diagrams or picture can also be exchanged along with voice messages, then this type of conferencing is called audio-graphic. Non-moving visuals are added using a computer keyboard or by drawing / writing on graphics tablet or whiteboard.

2. Video – Conferencing – Video Conferencing allows the exchange not just of voice and graphics but also of moving images. Video-Conferencing technology does not use telephone lines but either a satellite link or television network (broadcast / cable).

3. Web – Based Conferencing – Web-based conferencing as the name implies, involves the transmission of text and graphic, audio and visual media via the internet; it requires the use of a computer with a browser and communication can be both synchronous and asynchronous.

4. Open and Distance Learning – All these services availed through ICT plays a significant role in teacher education. It allows higher participation and greater interaction. It also improves the quality of education by facilitating learning by doing, directed instruction, self-learning, problem solving, information seeking and analysis and critical thinking as well as the ability to communicate, collaborate and learn.

The Future of ICT in Education- As ICT in education continues to evolve, it will play an even more critical role in shaping the future of learning. Emerging technologies, such as artificial intelligence (AI) and virtual reality (VR), are set to further transform the educational landscape by offering personalized learning experiences and immersive learning environments. Schools that adopt these technologies early will be at the forefront of educational innovation.

Conclusion - The use of such technology in teaching training programmes the quality of teaching will increase effectively. A well-designed teacher training program is essential to meet the demand of today's teachers who want to learn how to use ICT effectively for their teaching. It is thus important for teacher trainers and policy makers to understand the factors affecting effectiveness and cost-effectiveness of different approaches to ICT use in teacher training so training strategies can be appropriately explored to make such changes viable to all. So, if use of ICT in teaching training programmes by the institute of conducting teaching training programmes, our teaching learning process will be too smooth and able to understand for every type of students of our country. Finally, more attention should be paid to specific roles of ICT in offering multimedia simulations of good teaching practices, delivering individualized training courses, helping overcome teachers" isolation, connecting individual teachers to a larger teaching community on a continuous basis, and promoting teacher to teacher collaboration. Intended outcomes as well as unintended results of using ICT for teacher professional development need to be explored.

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