The Role of Emerging Technologies In Education And Digital Learning Platform

Rachana. & Prof. Deepti Johri,

Department of Education, Bareilly College, Bareilly.

Abstract

The present paper attempts to analyse the effective role of modern emerging technologies in education and digital teaching learning process. The advent of globalisation has brought about huge changes in the traditional teaching and learning process. A new era of tech-savvy generation has come into existence due to globalisation. The world has become very unique due to new learning platforms. Internet, Virtual Reality (VR), Augmented Reality (AR), Blog chain, 3D printing, Gamification, Artificial Intelligence (AI), Information Communication Technology, Virtual Classroom System, various online learning platforms have ushered in a new era which is considered a boon for the new educational system. Emerging technology of education and digital learning has ushered in a new era for academicians, students and research scholars in the new educational system. The present study reviews various platforms which are available from authentic web and apps. Any field of knowledge is considered to be the best way to establish the emerging technology learning process in education and digital teaching platform with the touch of emerging technology. The aim of the present paper is to explore the interplay between the application of digital mode of teaching and learning. It is all-inclusive.

Key Wards- Education, Emerging Technology, Digital Learning

1- Introduction

Education is the process of facilitating learning and the acquisition of knowledge, skill values, beliefs and habits .The rapid changes and increased complexity of today's world present new challenges and put new demands on our education system. Innovation have changed every area and education sector has also not remained untouched by this. Digitalization has made the environment of the class more interactive and participative. Technology has made imparting education stress free for both students and educators.

Innovation Teachers incorporate tools like table computers and mobile devices to offer students a more interactive experience. Digital technology has transformed education by enhancing accessibility, personalization, and flexibility. It enables online learning, provides instant access to educational resources, making quality education more affordable and widely available. The integration of emerging technologies in education is transforming the way students learn and teachers teach. These innovations make learning more interactive, engaging, and adaptable to individual needs. Although technology alone is not a panacea for educational challenges, it has the potential to bridge the gap in access and quality, preparing students for the demands of a rapidly changing world. As the educational landscape continues to evolve; educators, policymakers, and technology developers must work together to harness the full potential of emerging technologies. By doing so, we can ensure that the learning experience remains relevant, exciting, and empowering for students of all ages, ultimately leading to a brighter future for education. They are using digital technologies to cope with these active learners like smart class, Flipped class rooms, Blended method , Virtual Learning, Blogs, Moodle, Skype, Game Based Learning, SAMR , Social Networking sites, etc.

2- Emerging Technologies and Digital Learning

An emerging technology is one that is not in 'common' use currently in education, but which has the potential to be more widely adopted to support improvements in learning and teaching. Many of these technologies have been emerging for a number of years. Many continue to evolve at pace and will be in a state of continuous 'emergence'.

Digital learning is supposed to supplement rather than completely replace traditional learning techniques. The following are some common pedagogies, or teaching techniques, that integrate technology and learning;

- **Virtual Reality**-

This is an immersive technology that creates a simulated environment, enabling users to interact with and experience it in a way that appears real.

- **Augmented Reality**

Augmented Reality can be considered a dynamic and interactive didactic tool that contributes to transforming the places, times and ways of learning, through which school laboratories and classrooms are beginning to be widely equipped with technological infrastructure. For example, WI-FI networks allow students to connect to the Internet by directly managing their own devices so that they can carry out research and classroom activities, changing the way the classroom is managed.

- **Mobile learning**

 Process of developing knowledge and skills through educational content and activities on mobile devices, providing flexible and accessible learning opportunities anytime anywhere.

- **Artificial Intelligence**

  This is a field of computer science that focuses on the development of intelligent machines capable of performing tasks that typically require human intelligence. The process of developing knowledge and skills through educational content and activities delivered on mobile devices, providing flexible and accessible learning opportunities anytime anywhere.

- **Gamification**

  Gamification is an uprising trend that applies gaming mechanics as a driver to motivate, engage and enhance the user experience. It is a rapidly growing phenomenon that has shown to provide engaging and compelling solutions in the educational and learning context. An initial framework is based on foundational psychological theories, including SDT and intrinsic and extrinsic motivation. **(Zamzami 2020)**

- **Internet of Things :**

  Internet of things supports the integration of sensors and smart devices like digital whiteboards. Educators can provide diversified and interactive instruction with these technologies. **(Jamir 2023)**

- **Block Chain:** Although most of its work is done in the background, block chain is an essential tech tool. With this tool, institutions can secure important information and verifications. This process expedites digital transcripts and credentials**. (Jamir 2023)**

- **Mobile Learning**

The process of developing knowledge and skills through educational content and activities delivered on mobile devices, providing flexible and accessible learning opportunities anytime anywhere.

- **Massive Online Open Courses (MOOC)-**

A massive open online course (MOOC) is an online course aimed at large-scale interactive participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for the students, professors, and teaching assistants (TAs).

- **Blended learning**-

Blended learning combines traditional face to face classroom approaches with online instructional materials and opportunities for online engagement. It necessitates the actual presence of both the teacher and the student, as well as learners control over time, location, path ,or place. While classroom role- playing with immediate face to face feedback is available, online learning provides personalized ,self- paced learning with e-learning components that lend themselves to interactive media such as skill - building games, videos , tutorials, quizzes and social media components ,all of which are accessible from the learners home page in the Learning Management.

- **Personalised learning:**

ICT and communications technology can be a powerful tool for personalized learning it gives students access to research and information while also allowing them to communicate, debate, and track their progress. Personalized learning, on the other hand, is not limited to digital technologies or environments . Personalized learning is frequently associated with 'customisation,' with digital personalization being used to define the learning experience as highly efficient.

- **Flipped Classroom**-

A flipped Classroom is an innovative method of teaching. The term "Flipping" a classroom refers to a paradigm shift in how pupils learn new information .Students in a flipped classroom are encouraged to read or watch lecture videos before class, and then class time is allocated for debates , Problem - Solving, or other types of active learning that will help them realize and internalize their new knowledge. To use Bloom's revised taxonomy (2001) as a framework, the" flipped " classroom let's students do the lower levels of cognitive work (gaining knowledge) outside of class time and then focus on the higher levels of cognitive work (applications, analysis and evaluative reasoning).

- **Cloud Computing** "Cloud Computing" refers to a system where all data processing and storage takes place outside the user's devices and through these databases. A distributed computing application that offers scalable and dynamic computer resources, such as storage and processing power, is supplied as a service over the Internet. Nowadays, practically every area of information technology uses cloud computing due to its simplicity in deployment, management, scalability, security, and other related qualities. Instead of installing applications on their premises, which burdens them with the costs of building networks, maintaining, and managing them, it is practical and advantageous for enterprises to use cloud data centers. Teachers can submit class tutorials, assignments, and assessments on the cloud server. By examining students' study logs, the educational system will enable teachers to pinpoint problematic areas where students tend to make mistakes. This will enable educators to develop their instructional strategies and materials. This will enable educators to enhance their resources and pedagogical strategies .

3- Benefits

- The advent of technological tools such as e-learning platforms, artificial intelligence, and digital learning resources has significantly improved access to educational materials for both teachers and students. These advancements foster greater interaction and support the development of learners' independent study skills.

- Digital transformation creates a more interactive, engaging, and effective learning environment. It also helps teachers use innovative and individualized teaching methods.

- Digital transformation is revolutionizing education by enabling learners to access knowledge anytime and anywhere through online learning platforms. This eliminates traditional barriers of geography and time, particularly benefiting individuals in remote areas or those without access to conventional

schooling. As a result, educational opportunities become more equitable, allowing more people to pursue learning without interruption.

- Digital learning tools provide new methods of interaction, such as learning through video, online discussions, or participating in virtual classrooms. These methods not only make learning more enjoyable and dynamic but also encourage active participation from students. Learning software that supports automatic testing and evaluation also helps students receive timely feedback.

- Digital transformation reduces costs related to printing, learning materials, and facilities. Instead of printing physical documents, all lectures, textbooks, and assignments can be shared online. Additionally, educational management software automates many administrative tasks like managing grades, student information, and related procedures, saving time and human resources.

- During digital transformation, both teachers and students become familiar with and use digital tools, thereby developing necessary technological skills for the digital age. These skills not only help them teach and learn better but are also important for future work and life.

- The use of data in educational management gives schools an overview of learning performance, common issues, and areas that need improvement. Data analysis technologies offer solutions to adjust curricula and improve teaching quality in an accurate and effective manner

- Technology in education allows for creating learning programs that suit the needs and levels of each learner. Thanks to smart learning platforms and AI, teachers can monitor students' learning progress and adjust study materials accordingly. Each learner can study at their own pace and focus on areas they need to improve, thereby enhancing learning effectiveness.

4- Challenges

- "Despite investments in technological infrastructure, numerous rural and remote regions continue to experience unreliable internet connectivity and limited access to modern learning devices. This results in a significant disparity in educational quality between urban and rural areas.

- Significant strides have been made in integrating technology into education, a key challenge remains the limited digital proficiency among both teachers and students. Many educators lack the necessary skills to create digital learning materials and are unfamiliar with using Learning Management Systems (LMS), which can negatively impact the quality of instruction.

- Digital transformation in education requires a change in teaching approach and mindset, yet not all teachers, students or parents are ready to embrace these changes. Many teachers prefer traditional methods over digital tools.

- "Information security and privacy for both students and teachers remain critical concerns amid digital transformation. The management, storage, and use of personal data in digital environments can pose significant security risks, particularly within education systems that lack strong protective measures."

- The shift to digital transformation in education risks exacerbating inequalities in access, especially for underprivileged students. Limited financial resources may prevent these students from acquiring necessary digital devices or reliable internet connectivity, leading to unequal learning opportunities. This digital divide can impede academic progress and limit future prospects.

5- Solutions to Support the Digital Transformation Process in Education

1- To raise awareness in society, especially among teachers, students and educational administrators, about the role and importance of digital transformation in education.

2- Upgrading and expanding digital infrastructure.

3- The quality of online learning materials is crucial to the effectiveness of digital education. Therefore, digital learning materials in modern teaching should be diverse, rich and tailored to different student groups. Resources such as video lectures, online exercises and interactive simulations should be widely used to make learning more engaging and easier to understand.

4- Improving the Legal Framework and Developing Online Learning and Education Management Platforms

5- To facilitate this process, policies and regulations governing the use of technology in education need to be developed and improved. Authorities should issue detailed guidelines on student data usage, personal information security, and regulations on online teaching to ensure fairness and safety for all participants.

6- A new era has been brought about by a variety of online learning platforms, which is seen as advantageous for the new educational system. Therefore, integrating digital learning within the curriculum is crucial for policy makers..

6- **Conclusion** - The integration of emerging technologies, including virtual reality (VR), augmented reality (AR), and online learning platforms, has brought about significant changes in the education system in India. These technologies have had a positive impact on student engagement, learning outcomes, personalized learning, expanded access to education, and collaboration. Digital learning platforms have expanded access to quality education, helping students in remote areas access educational resources and connect with peers and experts globally. These emerging technologies have also facilitated personalized and adaptive learning experiences. With AI-powered algorithms, online learning platforms can tailor content and recommendations based on individual student needs and learning styles. This personalized approach promotes self-paced learning, addresses individual strengths and weaknesses, and fosters a deeper understanding of the subject matter. Furthermore, the integration of emerging technologies has facilitated collaboration and global connectivity in the education system. Students can connect and collaborate with peers and experts from different geographic locations, thereby promoting cross-cultural understanding and fostering collaborative problem-solving. Access to global educational resources and perspectives enriches the learning experience. To fully realize the potential of these emerging technologies in transforming the education system in India, several challenges need to be addressed. These include infrastructure limitations, ensuring equitable access to technology across socio-economic backgrounds, providing adequate training and professional development for teachers, and addressing privacy and data security concerns. In conclusion, the integration of emerging technologies such as VR, AR, and online learning platforms has revolutionized the education system in India. These technologies have increased student participation, personalized learning experiences, expanded access to education, and promoted

collaboration and global connectivity. By addressing challenges and investing in infrastructure, teacher training, and digital content, India can harness the transformative power of emerging technologies to create a more inclusive, dynamic, and effective education system that prepares students for success in the digital age.

Reference-

- **Almufarreh.A.,ArshadM.,(2023)** Promising Emerging Technologies for Teaching and Learning : Recent Developments and FutureChallenges.https://www.mdpi.com/2071-1050/15/8/6917 10/04/2025.

- **Guha, Tapas (2009)**; Oxford English- EnglishHindi Dictionary Oxford: University, Press

- **Gusho, L., Muçaj, A., Petro, M., & Vampa, M. (2023).** The use of educational technology to improve the quality of learning and teaching: A systematic research review and new perspectives. International Journal of Emerging Technologies in Learning (Online), 18(15), 109

- **Herrington, J., & Parker, J. (2013**). Emerging technologies as cognitive tools for authKarim, A., Nasir, A., Al Arif, I. M.

- **Spector, J. M. (2014).** Emerging educational technologies: Tensions and

Synergy. Journal of King Saud University-Computer and Information Sciences, 26(1), 5-1

- **Williams J (2023).** Topic Name, Retrieved from https://www.instructure.com/resources/blog/6-emerging-technologies-education on 10/04/2025

- **Fabunmi, & Adesoji, F., (2012).** Undergraduate students' perception of the effectiveness of ICT use in improving teaching and learning in Ekiti State University. Ado-Ekiti, Nigeria. International Journal of Library and Information Sciences, 4(7), 121-130.

- https://education.gov.scot/resources/emerging-technologies-emerging-practices-in-education.