National Webinar on

Integration of Modern Techniques
in Teaching-Learning

शिक्षण–अधिगम में आधुनिक तकनीकों का समावेशन

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# Need and Application of Technology in Modern Education System

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Graphical Abstract

This chapter explores the numerous ways that technology is being used in the field of education, such as e-learning platforms, virtual classrooms, educational apps, and online assessment tools. It highlights the advantages of these programs, including their adaptability to different learning styles and scalability to meet the demands of different sized classes.
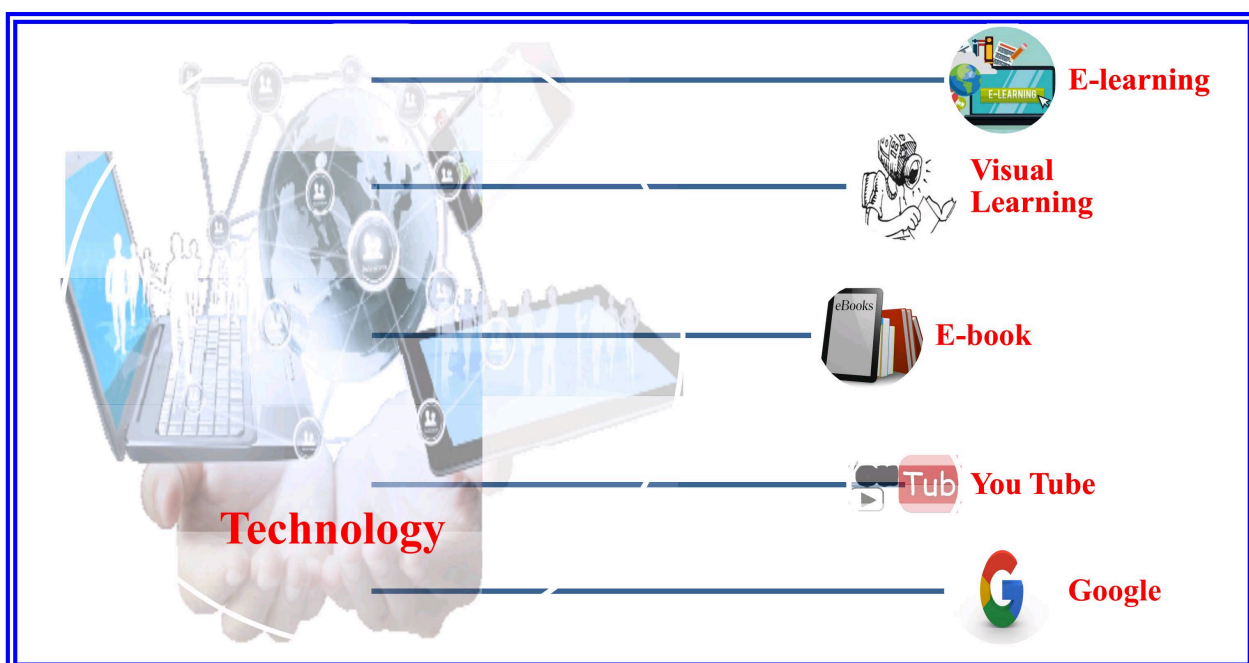
Abstract

It is now essential for the 21st century educational system to include technology in order to satisfy the changing demands of both students and teachers. In this chapter, the vital role that technology plays in education is examined, along with a wide range of its uses, with a focus on how it has a profoundly positive influence on both teaching and learning. As a result of technology improvements, the educational scene has undergone major changes recently. A more dynamic, interactive, and individualized teaching method made possible by technology is progressively replacing the conventional chalk and board method. The need to better engage students, improve their educational experiences, and get them ready for a future that is largely

digital is what drives the demand for technology in education.This chapter explores the numerous ways that technology is being used in the field of education, such as e-learning platforms, virtual classrooms, educational apps, and online assessment tools. It highlights the advantages of these programs, including their adaptability to different learning styles and scalability to meet the demands of different sized classes. It looks at how technology has democratized education by giving students everywhere access to high-quality resources and teachers, promoting cross-cultural knowledge exchange and cooperation. It demonstrates how technology is changing the face of education and offers a thorough overview of the opportunities and difficulties that come with its integration, highlighting the significance of careful and responsible implementation to realize technology's full potential for the advantage of both students and educators.

1

1. Introduction

The modern era is the era of technology and science. The modern world is incredibly dynamic, and we are always being exposed to new technology advancements [1-2]. The influence of technology in every part of our life keeps expanding as the 21st century progresses. Education is one area where technology has had a significant influence [3]. All nations are following the global trend toward technology in order to create a competitive economy and raise the standard of living for their citizens. Technology plays a crucial role in the world we now live in. Modern education now includes a significant and revolutionary role for technology. As classrooms switch from static chalk-and-board settings to dynamic, tech-infused learning spaces, the educational landscape has recently undergone a seismic change [4]. The understanding that technology has the potential to improve accessibility, engagement, and effectiveness in education has been the driving force behind this transition [5].

The digital materials have broadened the scope of education and given students access to a variety of information at any time and from any location. With immersive and hands-on learning opportunities, artificial intelligence, virtual reality, and augmented reality are altering how students perceive and engage with educational information [6]. Communication is being improved through collaboration technologies and data analytics, which are also forming more individualized teaching plans.But as technology advances, it also brings with it problems like the digital divide and privacy issues. Though a paradigm change, the incorporation of technology into education promises to provide students the knowledge and adaptability they need to succeed in our increasingly digital and linked society. This extensive transition emphasizes how important it is for modern educational institutions to comprehend and utilize technology's possibilities**(Fig 1)**[7].
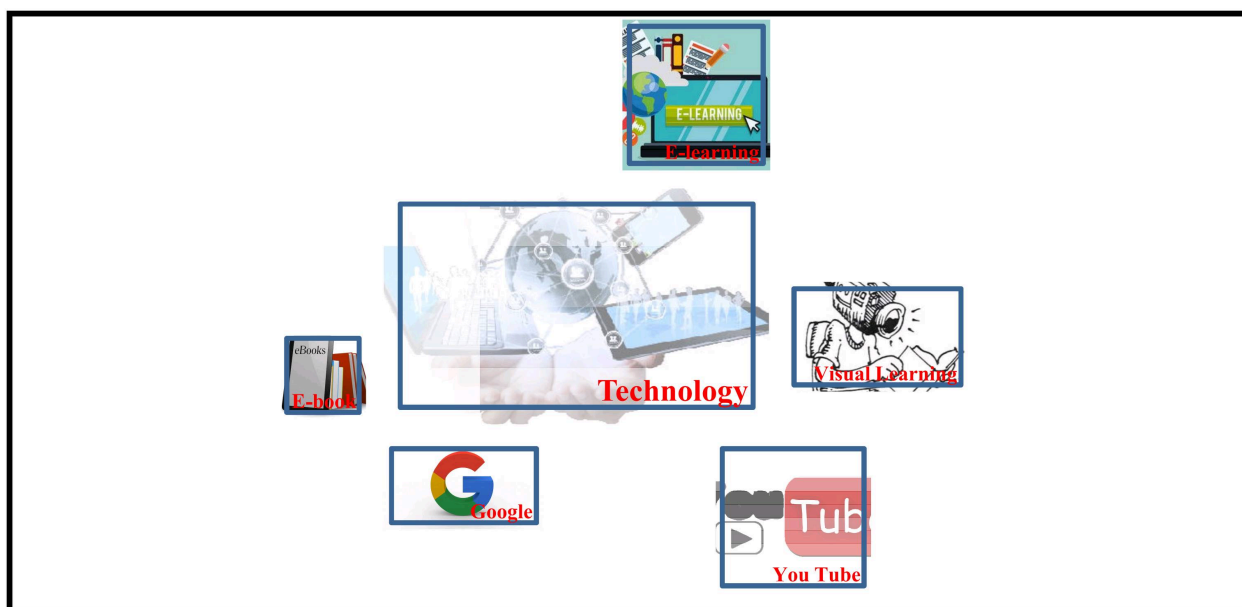
Fig. 1 A systematic representation of essential objectives of education technology.

2. Modern technology in education

Today's technology is a vital part of our lives. It is regarded as the cornerstone of economic expansion. In the current environment, a technology-deficient economy cannot expand. This is due to how much easier and faster technology has made our work [8]. Every potential subject is affected by technology, and education is one of them. Education has undergone a revolution because to modern technology, which has improved accessibility, engagement, and tailored instruction. By allowing remote learning, online platforms eliminate regional restrictions [9]. Virtual reality and interactive applications produce immersive learning experiences that boost student engagement. Individual learning demands may be met through customized content distribution made possible by big data analytics and AI-driven solutions. Students and instructors may communicate and share resources easily thanks to collaboration tools and cloud-based platforms. But there are issues that must be resolved, like the digital gap and privacy worries[10]. All things considered, current technology empowers teachers and students, enabling a flexible and dynamic educational environment that equips pupils for the challenges of the digital age.

The usage of current tools and equipment boosts students' learning and involvement, according to the most recent research on how exactly modern students choose to use technology today and how using technology affects their learning. When technology is used to help, they find it to be lot more engaging and fuller of intriguing places. Knowledge transfer becomes incredibly simple, practical, and efficient. This indicates that, in every area of life, including schooling, our minds now tend to function more quickly when supported by contemporary technology**(Fig. 2)**[11].
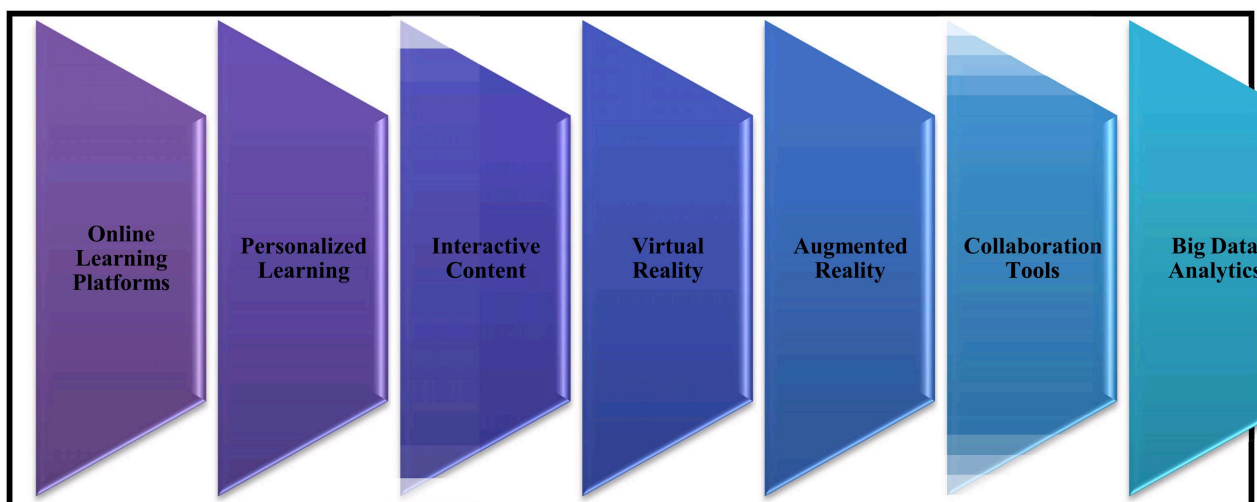
Fig. 2 Systematic representation of somekey advancements of education.

3. Why need of technology in modern education system

Digital technology must already be used in education due to their globalization. For teaching, resource sharing, evaluation, and administering the daily operations of academic institutions, online platforms were accessible. It will aid students in preparing for occupations that include using wireless technology in the future. In both teaching and learning, technology is quite helpful [12]. Numerous websites that are beneficial to both instructors and students are readily available online. Students are encouraged and motivated to learn via technology [13-14]. The instructor also incorporates technology tools into their presentations.Teachers can monitor student progress, pinpoint areas for development, and optimize their lesson plans thanks to big data analytics. Learning results and curriculum development are optimized by this data-driven approach.Knowledge of technology is essential in a world that is becoming more and more digital. Students who are exposed to technology in the classroom get the digital literacy and problem-solving skills required to succeed in the job market of the twenty-first century [15].The cost of educational materials can be decreased by using online resources and digital textbooks, increasing access to and affordability of education.Digital materials are environmentally benign since they lessen the demand for paper and the environmental impact of education**(Fig. 3)**[16].

Technology improves accessibility, engagement, and customization in the current educational system while preparing students for the needs of a digitally driven society. It promotes diversity, international cooperation, and data-driven development, eventually resulting in a more adaptable, efficient, and fair educational experience [17].

Fig. 3 A systematic representation of digital classroom.

4. The role of technology in modern education system

Technology has a significant impact on today's educational system, changing how students learn and how professors impart knowledge. Here are a few main arguments in favour of technology in education [18].

4.1.Access to information

Technology makes it simple to access large volumes of knowledge and learning materials. Students can use the internet to conduct research, access online classes, browse digital libraries, and learn things that aren't included in traditional textbooks.

4.2.Enhanced learning experience

Technology improves education by making it more individualized, interactive, and exciting. Simulators, virtual reality, educational software, and multimedia tools may all be used to bring abstract ideas to life and improve learning and memory [19-20].

4.3.Collaboration and communication

Collaboration and communication between students, instructors, and classmates are made possible through technology. Online platforms, forums, video conferencing, and collaboration tools make it simple to share ideas, work in teams, and build relationships around the world. Beyond the classroom, students may work together on projects, get feedback, and have important conversations [21].

4.4.Individualized learning

Learning experiences may be individualized and adaptive thanks to technology. Software and platforms for education may identify the requirements of each student and offer materials and lessons that are specifically suited to those needs. In order to promote unique learning routes, adaptive learning systems can modify the pace, degree of difficulty, and material based on each student's development and learning preferences [22].

4.5.Remote and online learning

As was evident during the COVID-19 epidemic, technology has proven especially important during periods of remote or distance schooling. Students may access educational resources and communicate with teachers remotely thanks to online learning platforms, video conferencing technologies, and educational applications [23].

4.6.Data-driven insights

The gathering and analysis of data on student performance, engagement, and advancement are made possible by technology. Learning management systems and educational analytics may offer instructors and administrators useful information that can be used to pinpoint problem areas, monitor student progress, and make data-driven decisions that will improve educational results [24].

4.7.Skill development

Students are given the necessary digital literacy abilities for the 21st century thanks to technology. Students gain knowledge about how to use digital tools, assess information critically, communicate clearly online, work remotely, and adjust to quickly changing technology advances. Success in the digital era requires certain abilities [25].

4.8.Accessibility and inclusivity

By making education accessible to students with a range of needs and skills, technology fosters inclusion. Students with impairments can engage completely in educational activities by using

assistive technology like screen readers, captioning tools, and adapted equipment, which can remove learning obstacles [26].

In general, the use of technology in the current educational system empowers students, improves teaching techniques, increases access to knowledge, and gets pupils ready for a technologically advanced society. It encourages individualized instruction, group work, critical thinking, and provides students with the tools they need to succeed in the future [27-28].

5. Factersaffecting technology in modern education system

Technology performance is a complex process that depends on its uniqueness, the relationships between human resources, and educational environments. The following elements are noted as having an impact on educational technology use [29].

5.1.Access to inappropriate content

The main worry about technology use is how simple it is to get and see pornographic, violent, and other improper information.

5.2.Teacher's factor

The teacher is connected to a collection of elements that are frequently highlighted as influencing how technology is used in education. The primary aspect relating to the use of technology has always been recognised as the instructors' opinions on how to and competency with it. If a teacher doesn't use technology in the classroom, they should not hold to positive views about it. Additional elements that seem to encourage the correct use of technology in education include the instructive attitude and instructional practices of the teacher [30-31].

5.3.A disconnected youth

When individuals are glued to their screens virtually constantly, it has a negative impact on society and is resulting in a brand-new set of societal problems.

5.4.Technology factors

Technology itself is one of the many elements that influence how teachers use it. Contradictory ideas on the important effects of technology should be used in education today. This causes the instructors to become unsure of the appropriate educational ethics of technology. Teachers also find it challenging to keep up with the most recent technological developments due to the constantly evolving technologies. This is due to the fact that new gear and software are released every day, and instructors find it difficult and intimidating to keep up with this enigmatic beast of technology [32-33]. The following barriers are also frequently mentioned:

- ✓ Limited time
- ✓ Absence of access
- ✓ Inadequate resources
- ✓ Lack of knowledge
- ✓ Lack of assistance

When students use their mobile phones or other devices in class, their attention spans substantially decrease. Their teacher and lessons become less important as attention is diverted to what they are seeing, playing, or doing on their phones [34].

6. Challenges of technology in modern education system

The digital gap, which occurs when not all pupils have equal access to technology and causes educational differences, is one of the challenges of technology in contemporary education. Data gathering and storage for individualized learning raise privacy issues [35]. Effective technological integration is hampered by inadequate teacher preparation, and maintaining content quality despite the wealth of internet resources is difficult. Students' well-being and concentration are impacted by excessive screen time and technological distractions. Concerns that persist include providing fair access, resolving technological problems, and juggling innovation with conventional teaching techniques [36]. To protect student rights and uphold ethical standards in education, it is important to manage AI, data analytics, and surveillance issues carefully.Technology has significant challenges, particularly in its implementation and use. Concerns about excessive screen time, the effectiveness of instructors' use of technology, and technological equity issues are also brought up. The COVID-19 issue has increased the importance of the material [37].

In order to guarantee that technology's advantages are widely available, equally distributed, and morally upstanding, it is crucial to overcome these difficulties. Successfully navigating the changing world of technology in the current educational system requires a careful, balanced approach, continual study, and adaptation (**Fig. 4**)[38]**.**

Fig. 4 Systematic representation of challenges of technology in modern education.

7. Future prospects for technology in modern education

Technology in education is primed for transformational expansion in the future. AI-powered personalized learning will spread, adjusting schooling to individual requirements. Immersive, interactive experiences will be possible with virtual and augmented reality [39]. Expanding online and mixed learning will give more people flexible access to high-quality education. Data analytics will improve learning outcomes by improving teaching strategies. New technology will promote digital literacy and critical thinking abilities. Global collaboration will thrive, fostering a variety of viewpoints [40]. It will become more accessible to everyone, including those with impairments.All linguistic barriers will vanish, and there will be more regional language learning materials available online. Programs for m-learning and e-learning give teachers and students access to a huge library of informational resources [41]. While technology will play a crucial part in determining the future of education, effective use of new teaching tools will depend on a new generation of teachers who recognize the value of interpersonal interaction in the classroom. However, for a successful future in education, ethical issues like data privacy and AI ethics will need to be carefully considered and regulated**(Fig. 5)**[42].

In conclusion, the use of technology in education has enormous promise for innovation, customization, and accessibility. To fully capitalize on these opportunities and build a more effective and fair educational system, it will be necessary to address issues relating to equality, privacy, and ethics [43].
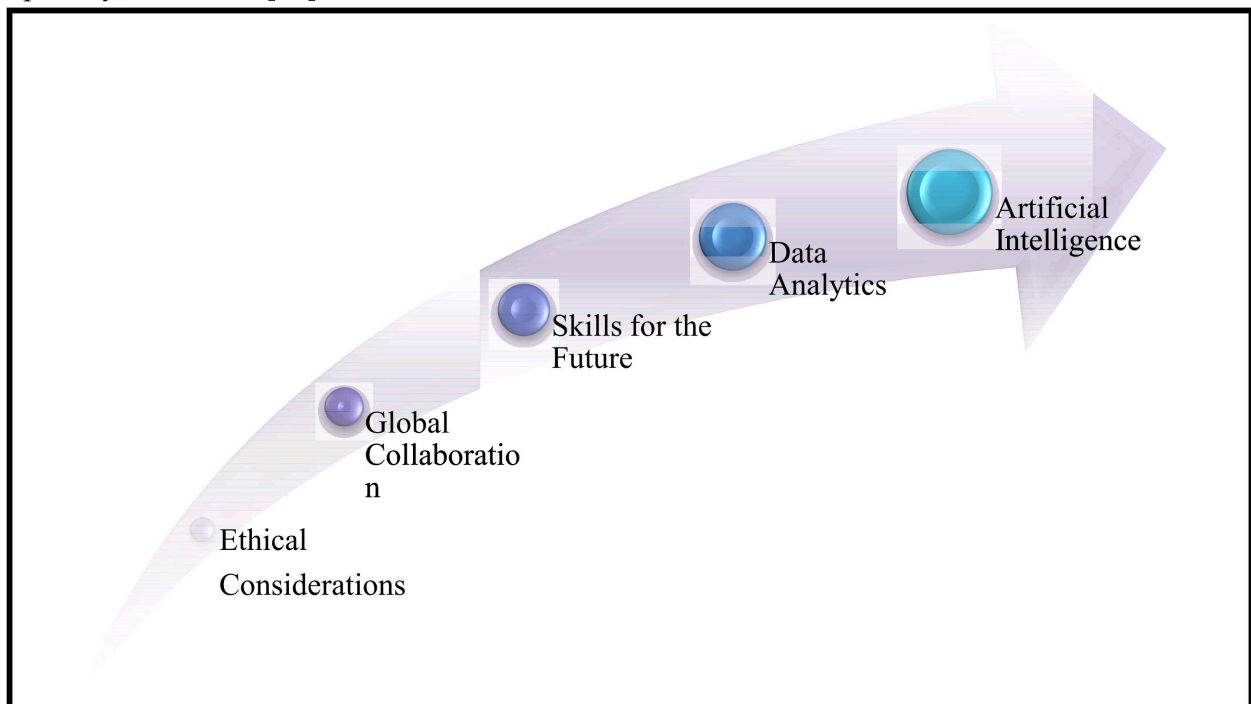

Fig. 5 Some future aspect of modern technology in education system.

8. Conclusion

The chapter "Need and Application of Technology in Modern Education System" concludes by highlighting the unquestionable importance of technology in redefining modern education. It has become clearly evident that technology is essential in today's educational environment and not just a choice. The use of technology in education has changed how we teach and learn. Examples include e-learning platforms, virtual classrooms, educational apps, and online assessment tools. In order to accommodate the various demands and learning preferences of students, it provides accessibility, flexibility, and scalability. Additionally, technology has the ability to reduce educational disparities and provide students throughout the world access to high-quality instruction.The digital divide and worries about too much screen time are only two of the difficulties that come with using technology in education, so we must always be aware of them. To maximize technology's beneficial effects, these issues must be addressed and the technology must be used appropriately. In summary, technology is a necessary tool for modern education because it allows us to design learning environments that are more effective, inclusive, and engaging. Utilizing technology's potential while juggling creativity and responsibility will be essential as we traverse the digital era in making sure that education continues to change and adapt to suit the ever-changing requirements of students and instructors.

Authors contribution
The manuscript was written through the contributions of both authors. All authors have approved the final version of the manuscript.

Notes
All authors declare no competing financial interest.

Conflicts of interest
There are no conflicts to declare.

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