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Role of Technology in Shaping Future of Education

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Executive Summary

COVID-19 epidemic has caused a fundamental transformation inhow we learn and how we teach, leaving an enduring effect on the educational system. The rapid adoption and use of educational technology (EdTech) steadily become a means to guarantee smooth learning by this unexpected circumstance. EdTech has become a major facilitator, facilitating both educational institutions and educational seekers to learn new set of skill and adapt to the demands of changing world, independent of geographic constraints. EdTech combines technology and digital media with conventional teaching methods to enable multimodal of learning. This offers flexibility, convenience, improves engagement, and produces learning solutions that are globally recognised. The aim of the chapter is to bring key insights about the increasing role of technology in opening new areas of learning in education industry.

Key Words: Educational Technology, Ed Tech startups, Digital literacy

1. Technology and Education

Technology is essential to education because it gives support to students in developing future-ready skills. By offering individualized experiences that accommodate different requirements and learning preferences, it improves accessibility and inclusion through virtual classrooms and online learning environments. By providing equitable access to technology and the internet, it empowers underprivileged communities and tackles the issue of the digital divide. Blended learning strategies offer flexibility and customisation by integrating virtual and real components. Learning becomes dynamic and engaging with the use of gamification and interactive tools. Learning analytics are used in data-driven education to provide individualized and customized instruction, course curriculum and track student development throughout the learning process. Through the development of future-driven abilities like digital

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literacy, teamwork, and communication, technology helps students get ready for the needs of the labor market.

Technology has left a long lasting impact on education by giving students access to more information, encouraging their participation in classes, boosting their motivation, and offering new resources for information creation. In addition to having a profound impact on daily life and work, computers, the Web, and related technologies have completely changed the scenario of teaching-learning.

Today students can instantly access nearly any type of needed information at any time, unlike in the past when they had to visit a library to look it up in dingy reference books. This has eliminated the need, for students to memorize information that can be looked up and was highly time consuming; instead, this time would now be better used to assist and help students in differentiating between reliable and inaccurate sources of information. The use of technology in the classroom has also alter the pattern of student activities. This approach shifts the focus from students passively listening to lectures to actively learning and applying what they have learned. Technology has had a positive effect on student learning and it also changes how teachers conceptualize teaching.

1.1 Understanding the Role of Technology in Education

The way we learn has been completely transformed by technology, which has also given teachers and students new opportunities. Enhancing accessibility and diversity, creating skills that are ready for the future, encouraging motivation and engagement, enabling data-driven teaching, and streamlining administrative procedures are all made possible by integrating technology into education. In the current digital age, having a solid understanding of the benefits of technology in the classroom is essential to developing engaging and productive learning environments that will equip students for success in the twenty-first century.

In the following sections, we will discuss the key reasons why technology is crucial in education and its positive impact on various aspects of the learning process**.**

1.1.1 Easy Access to a Wide Choice of Updated Material

By removing geographical boundaries and opening up education to a larger spectrum of students, technology improves accessibility. With the help of virtual classrooms and online learning platforms, students can access educational

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materials from any location, guaranteeing that access to knowledge is not restricted.

1.1.2 Development of Digital Literacy Skills

Through the use of technology in the classroom, students can acquire the fundamental digital literacy skills needed to succeed in the modern world. Students learn to use digital tools and platforms, preparing them for the digital workforce. In technology-enabled learning environments, students participate in online conversations, virtual collaboration, and project-based activities that improve their communication and cooperation abilities.

1.1.3 Data-Driven Education

Technology enables data-driven education, providing valuable insights into student performance. Learning analytics and predictive analytics help educators identify areas of improvement and tailor instruction accordingly. This data-driven approach enhances learning outcomes by informing curriculum design and individualized support. Technology makes data-driven education possible and offers insightful information about student performance. Teachers can pinpoint areas for improvement and adjust their instruction by using predictive and learning analytics. Through curriculum design and tailored support, this data-driven strategy improves learning outcomes.

1.1.4 Makes Learning Fun and Engaging

Learning today requires more than just doing the work. It also requires learning to be fun. Students are easily distracted. Especially now with the time-consuming influence of social media. Learning through the use of educational technology will also keep students engaged and motivated.

1.1.5 Simplified Administrative Processes

Technology equips educational institutions with efficient management systems and streamlines processes such as attendance tracking, classification and resource management. This automation frees up teachers' time to focus on teaching and supporting students, improving overall productivity and efficiency.

1.1.6 Stay Tuned

Due to the development of technology, students can improve their knowledge in various fields and acquire new skills to use in the future. Students who are aware of the latest technological developments will have the advantage

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of improving their knowledge in various fields. In addition to having a very thorough understanding of new technologies, these students will be well equipped to land a job faster. They can help companies become more efficient by knowing how and why these technologies can be used.

2. Educational Technology

Educational technology refers to methods and principles that combine science, technology, and psychology in a way that makes learning and teaching simple, easy, efficient, and effective. Its definition, form, and meaning change in tandem with new discoveries. Modern scientific and technological innovations have an impact on all facets of human existence. Their impact on education, instruction, and learning has also been substantial. These methods (i.e., skills) have been developed in the field of education as a result of the most recent research, discoveries, and investigations, and they are aiding in the accomplishment of all educational goals. We refer to these abilities and proficiencies—which are particularly grounded in science—as educational technology.

The term **"educational technology" (edutech, edtech)** refers to the combination of laptop hardware, software, and educational concepts and activities that are used to promote learning. When referred to by its acronym, edtech, the term is often used to describe the sector of companies that develop educational technology.

2.1 Future of Educational Technology

The future of EdTech is filled with interesting and fascinating trends and innovations that have the potential to transform the way we earn knowledge and future digital skills. Amidst the current global events and the potential for a worldwide innovations in technology, investing appears to be quite fascinating in technological areas. The global edtech market was estimated to be worth $106.46 billion in 2021, and that was only the beginning. This market is anticipated to increase by 16.5% approximately between 2022 and 2030 and by 2.5 times between 2019 and 2025, reaching $404 billion in 2025.

The number of unicorns in edtech is rapidly growing. Their numbers have nearly increased in the past two years. Globally, there were 36 edtech unicorns as of July 29, 2022. Over the past ten years, they have raised more than $30 billion together. These businesses are now valued at a combined $105 billion onthe market. China has eight unicorns in the edtech industry; the USA has sixteen; and India has seven.

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The rise in sale of gadgets enable people to use smartphones or tablets for work and study which is another factor responsible for the rapid growth of edtech. The epidemic accelerated the growth of edtech development as well. In an instant, new types of remote education emerged, and millions of students began their education via the internet.

2.2 *Trends in Ed-Tech*

2.2.1 Increase in Digital Footprints

The most significant lesson that the epidemic and the years preceding it taught us is that in order to improve children's lives, they need to have better access to technology and educational opportunities. Consequently, the future of education after Covid will be shaped by the demand for better digital tools required for social gatherings. Consequently, the future of education after Covid will be shaped by the demand for better digital tools and techniques required for social gatherings. Physical classrooms will be less attended, and more will be spent online is the future of education. This will lead to a change in the delivery of services like textbooks, tech support, course materials, and career counselling from physical to digital etc.

2.2.2 Gamified Learning

Video games often teach important life skills like problem-solving, critical thinking, social awareness, teamwork, and collaboration—contrary to the widespread belief that they are unhealthy and a waste of time. As a matter offact, one of the most inventive trends influencing the direction of educational technology is gaming. Forecasts indicate that the global market for game-based learning will reach USD 29.7 billion by 2026, growing at a compound annual growth rate of 21.9%. The estimated market value of educational technology games that support learning in 2021 was $11.0 billion.

The idea behind game-based learning is that students learn more efficiently and effectively when engaged in enjoyable activities that lead to specific goals. Whether learning online or in a classroom, the games teach important life lessons to learners.

2.2.3 Cohort learning

Cohort-based learning is the name given to a type of learning model in which a group of people enroll in and complete a course at the same time, allowing them to form a community while they are all learning and increases their competitive spirit.

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2.2.4 Use of Al and Automation

Automation and artificial intelligence are playing a significant impact in education. In the near future, more than half of learning management systems (LMS) will have artificial intelligence (AI) capabilities, and most of teachers will think that AI should be used extensively in the classroom. We will soon realize infact we are accepting that artificial intelligence (AI) exists to improve education and enhance the educational process for both teachers and students, not to undermine them. Automation and artificial intelligence (AI) in education have allowed us to reevaluate our entire educational system and method of instruction. Recently, a hybrid model has emerged to guarantee that we maximize the potential of our artificially intelligent enabled systems and our teachers as well.

2.2.5 Collaborative Learning

Collaborative learning is a student-centered type of learning where small groups are often given more openly complex tasks, and the teacher is just a facilitator. Active student participation in small groups is the foundation of collaborative learning as opposed to passive lecture-based instruction. The fundamental idea behind collaborative learning is that students create, discover, and transform knowledge in this model, which is why it is currently a popular trend. Students are also pushed to conclude because learning is perceived as something that a learner does rather than something that is done for learning.

2.2.6 Virtual Reality and Augmented Reality

In education, virtual reality (VR) and augmented reality (AR) have swiftly taken central position by providing immersive learning environments that allow students to investigate ideas in an interesting manner. For example, history students can use AR to explore ancient ruins, and medical students can use VR to practice surgical procedures.

3. Indian EdTech Start-ups: Success Stories

3.1 BYJU'S

The Bengaluru-based EdTech Company was founded by Byju Raveendran and Divya Gokulnath in 2011. It is an online tutoring and coaching startup that provides one to one coaching through online video lectures for students and physical classrooms at Byju's city centers from class 1 to class 12 and also for those who are appearing for competitive exams like IIT — JEE,

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NEET, CAT, GRE, and GMAT. Its platform is used by over 15 million students worldwide. As of Sept 2023, Byju's was valued at $5.1 billion. As of April 2023, the company claims to have over 150 million registered students and has 9,00,000 paid subscribers.

3.2 Unacademy

Founded in 2015 by Gaurav Munjal, Dr. Roman Saini, and Hemesh Singh, Unacademy is a successful Edtech company. Initially, Unacademy was founded in the year 2010 with video streaming on YouTube, but it was later officially launched in the 2015. It is an online platform that makes both learning and teaching easy with its educational videos and lectures.

3.3 Physics Wallah

India's top edtech online platform Physics Wallah was first started in 2016 as a YouTube channel by Prayagraj, Uttar Pradesh-born educator Alakh Pandey. Established by Prateek Maheshwari and Alakh Pandey, the company was founded in 2020. In June 2022, it raised $100 million at a valuation of $1.1 billion, making it a unicorn. In Kota, Rajasthan, PW opened Vidyapeeth, its first offline center simultaneously. In an economical and comprehensive manner, it aids learners in grades 6 through 12, as well as those preparing for the JEE and NEET exams. Additionally, they have lots of previous year's NCERT solutions, sample papers, JEE Mains, NEET, and BITSAT papers.

3.4 Vedantu

Students can take customized courses through Vedantu, the top EdTech startup platform in India. Teachers with advanced training coaches students on an individual basis in grades 6-12. They aim to increase learning outcomes and success rate through interactions between students and teachers. The company was founded in 2011 by Anand Prakash, Saurabh Saxena, Pulkit Jain, and VamsiKrishna. The edtech company based in Bengaluru offers two-way audio, video, and white-boarding technology.

WhiteHat Jr.,Upgrad, Careers360 are amongst other well known edtech ventures who are contributing in online educational platforms. Edtech companies have a bright future in India and have the power to completely transform the way education is provided. The need for online and remote learning is growing and still there are obstacles to overcome. EdTech startups have much more potential to develop and flourish as a result of changing market dynamics. The education sector will benefit greatly from EdTech initiatives thatconcentrate on offering creative, cost-effective solutions as well

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as high-quality content. EdTech businesses have the potential to be the nation's future, bridging gaps and assisting people from all backgrounds and classes in accessing education as a fundamental right, especially with the increase in interest in investment and in skill development and digital startups. As the businesses navigate the changing landscape of education is a move towards a more inclusive and brighter future in coming years.

4. Challenges of Technology in Education

EdTech has the potential to significantly enhance learning environments. But in an industry that has historically been so "old school," and more inclined towards physical interaction between teachers and students there can be resistance for the adoption of new tools or technology. Some common challenges include:

4.1 Infrastructure and Accessibility

One of the biggest challenges in incorporating technology into education is making sure the availability of technical infrastructure in educational institutions. Due to differences in access to devices, internet connectivity, and technical support, the digital divide may result in inequalities that may cause disadvantage for some class of students. It is imperative that these accessibility issues are resolved in order to guarantee equal opportunities for every student.

4.2 Digital Literacy and Teacher Training

Even though students are frequently tech savvy, it can be difficult for teachers to successfully integrate technology into their lesson plans. Sufficient training and professional development initiatives are necessary to equip educators with the skills and self-assurance needed to manage digital platforms, create content online, and employ technology in the classroom. Enhancing the digital literacy of educators and students is necessary for the effective execution of this strategy.

4.3 Information Overload and Distractions

Technology's excessive use can be advantageous or disadvantageous. Information overload and distractions are possible risks, even though it gives access to a multitude of knowledge. Students can easily become distracted from their academic work by social media, video games, and pointless websites

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4.4 Over-reliance on Technology

Increased access to technology for a class of students has sometimes made them over reliant and less hardworking for practical knowledge

4.5 Security and Privacy Issues

As technology is increasingly used in education, protecting student privacy and ensuring data security become top priorities. Educational institutions must establish robust security measures to safeguard sensitive student data and uphold ethical standards for data collection, storage, and use. Finding a balance between the benefits of technology and privacy concerns is necessary to establish trust and maintain a secure learning environment.

Conclusion

It is truly impressive how far technology has come. It is important to recognize that our students grow up in an increasingly technologically advanced world and provide them with unique opportunities to access and experience these developments. Students should be given ample opportunities to use the available technology so that they can stay current and contribute to world growth as efficiently as possible. EdTech is beneficial for both students and teachers, and its future is promising. With the integration of innovative solutions students can gain the necessary skills and competencies to succeed in the workforce. As we continue to navigate through the rapidly changing landscape of education, we can look forward to the transformative impact of EdTech onthe future of learning.

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