Role of Technology in Indian Education

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Abstract

There may be a rising broad consensus around the arena about the benefits that can be delivered to the schooling gadget via the suitable use of evolving statistics and communiqué technology. The range of viable advantages pervaded practically all areas of activity in which knowledge and conversation play a vital function. It's far from improved teaching and getting-to-know tactics to higher student final results, increased scholar engagement, and seamless conversation with instructors and dad and mom. Today there may be a great hole between understanding and capabilities students analyze in faculty and the know-how and abilities that employees want in places of work and communities. Employers file that they need professional college students, who have suitable ethical and painting ethics, can collaboratively paint in the crew, have critical questioning and hassle-fixing potential, can lead a collection of people, and are skilled in verbal and written conversation. This paper is to have a look at the function of education generation in India.

Keywords: Education Technology, e-Learning, Education Technology in India.

Introduction

Education technology refers to the utilization of all types of contemporary media and materials to enhance learning outcomes. Education technology has been identified by experts as one of several ways to disrupt education efficiently and effectively.

In the past, educators employed inflexible, traditional, and standardized methods of instruction. Learning was viewed as simply the transfer of information and concepts. Pupils would memorize whatever was presented by their teacher or textbook. Frequently, they struggled to comprehend the material and were required to regurgitate it during exams. Students were passive participants, unable to ask meaningful questions or engage in critical thinking.

In the present day, students are not seen as mere receptacles of knowledge. They are expected to engage with a variety of media and materials to enrich their learning journey. Education is now seen as a collaborative process of interaction and communication. Modern educators are tasked with supporting, guiding, and enabling the development of learners. Teachers must inspire and

motivate young students, while also aiding adult learners in their acquisition of knowledge and skills.

What is Education technology?

Technology in education is defined as a range of instruments that support the advancement of student learning and are used to measure how and why people act.

The research and moral practice of enabling e-learning—that is, learning and enhancing performance through the development, use, and management of suitable technical processes and resources is known as educational technology. The field of educational technology is predicated on using the term "technology" broadly to include the resources and instruments used to advance the field of education.

History of Use of Technology in Education

The origins of educational technology can be found in the development of extremely early tools, such as cave wall paintings. However, the debut of instructional movies in the 1900s or Sidney Presser's mechanical teaching devices in the 1920s usually marks the beginning of its history.

Training films and other mediated materials were used by the US military to instruct soldiers during World War II, marking the first widespread application of modern technology. Based on the notion that individuals may learn through auditory and visual reception, presentation-based technology is available today in a variety of forms, such as PowerPoint presentations and streaming audio and video.

During the 1990s, different schools have PC based learning (CBL) framework. They are now and again founded on constructivist and cognitive learning speculations, these conditions zeroed in on showing both unique and space-explicit critical thinking learning.

The 2000s development of various media and pervasive innovations gave another drive to arranged learning hypotheses inclining toward learning-in-setting situations. Understudies are currently experiencing childhood in a computerized age where they have consistent openness to different media.

Why is technology used in the Education Industry?

According to economists, three things cause growth, all of which are related to human capacity increases.

- **Capital extending -** the capacity of the labor force to utilize hardware that is more useful than prior variants
- **Higher quality labor:** a more proficient workforce that can enhance financial result
- **Technological innovation:** the capacity of the labor force to make, disseminate, offer, and utilization of new information.

Three complementary, but somewhat overlapping, methods that link education policy with economic development are based on these three productivity criteria.

➢ **The Innovation education approach:** Expanding the degree to which innovation is utilized by understudies, residents, and the workforce by integrating innovation abilities into the school educational program.

➢ **The Information developing methodology:** Expanding the capacity of understudies, residents, and the labor force to use the information to enhance society and the economy by applying it to settle perplexing, genuine world Issues.

➢ **The Information Creation approach:** Expanding the capacity of understudies, residents, and the labor force to improve, produce new information, and take advantage of this new information.

Technology as Tools of Teaching

Nowadays, a wide range of technology is employed in classrooms. Among them are:

➢ **Computers and Laptops:** Computers and laptops are ubiquitous in classrooms, providing access to digital resources, productivity tools, and educational software. They facilitate research, writing, programming, multimedia creation, and other learning activities.

➢ **Interactive Whiteboards:** Interactive whiteboards combine traditional whiteboard functionality with interactive touch screen technology, allowing educators to display and manipulate digital content, annotate presentations, and engage students in interactive lessons.

➢ **Tablets and Mobile Devices:** Tablets and mobile devices, such as iPods, Android tablets, and smartphones, offer portability and versatility in the classroom. They can be used for research, educational apps, multimedia creation, and accessing digital textbooks and learning materials.

➢ **Document Cameras:** Document cameras, or visualize, capture, and display real-time images of documents, textbooks, 3D objects, and student work on a larger screen or interactive whiteboard. They facilitate demonstrations, modeling, and sharing of visual content with the entire class.

➢ **Educational Software and Apps:** Educational software and apps encompass a wide range of digital tools and resources designed to support teaching and learning across various subjects and grade levels. Examples include learning management systems (LMS), educational games, simulations, virtual labs, language learning apps, and productivity tools.

➢ **Online Learning Platforms:** Online learning platforms provide virtual classrooms where educators can deliver instruction, share resources, administer assessments, and facilitate discussions with students. These platforms support blended learning, flipped classroom models, and distance education, enabling flexible and personalized learning experiences.

➢ **Digital Textbooks and E-books:** Digital textbooks and e-books offer interactive, multimedia-rich content that enhances traditional print materials. They often include features such as embedded videos, audio recordings, interactive quizzes, and hyperlinks to supplemental resources, providing engaging and dynamic learning experiences.

➢ **Learning Management Systems (LMS):** Learning management systems are online platforms that facilitate the administration, delivery, and management of educational courses and content. They allow educators to organize course materials, create assignments, track student progress, and communicate with students and parents in one centralized system.

➢ **Video Conferencing Tools:** Video conferencing tools enable real-time communication and collaboration among educators, students, and guest speakers, regardless of geographical location. They support virtual lectures, live discussions, group projects, and remote presentations, making it possible to connect with experts and peers worldwide.

➢ **Assistive Technologies:** Assistive technologies support students with disabilities by providing accommodations and accessibility features that address their individual needs. Examples include screen readers, speech-to-text software, alternative input devices, captioning tools, and text-to-speech converters.

➢ **Coding and Robotics Kits:** Coding and robotics kits introduce students to programming concepts and computational thinking through hands-on activities and projects. These kits typically include programmable robots, microcontrollers, sensors, and coding software, allowing students to design, build, and program their creations.

➢ **Virtual Reality (VR) and Augmented Reality (AR):** VR and AR technologies offer immersive learning experiences that simulate real-world environments, historical events, scientific phenomena, and more. They engage students' senses and enhance their understanding of complex concepts through interactive simulations, virtual tours, and educational games.

➢ **Data Analytics and Visualization Tools:** Data analytics and visualization tools enable educators and students to analyze, interpret, and visualize data to gain insights and make informed decisions. These tools support inquiry-based learning, statistical analysis, and data-driven instruction across various subjects, including STEM disciplines.

Education Technology Project in India

The Education Technology Project was incorporated into the Fifth Five Year Plan of the Indian government in 1971 when the Ministry of Education and Social Welfare recognized the value of education technology for improving the quality of education. The four sub-schemes for this project were as follows:

➢ Establishing an Education Technology Unit under the Ministry of Education & Social Welfare

➢ Provides 100% of the support necessary for states to establish Education Technology Cells and related initiatives.

➢ Supporting a few educational establishments to implement education technology initiatives.

➢ The establishment of a Center for Education Technology (CET) at the NCERT is in progress.

The unit was established within the Ministry in 1971, followed by the establishment of a CET in the NCERT in 1973. Education Technology Cells were established in various states starting from 1972-73.

The NCERT's CET started operating in the following regions once the Unit in the Service completed all necessary planning, strategy development, and resource allocation for the execution of the instructional task:

➢ Frameworks planning and execution.

➢ Model creation of reasonable equipment and programming

> ➢ Education Technology encompasses a diverse range of training opportunities across various areas.
> ➢ Research and Evaluation
> ➢ Assortment and spread of data, information, and consultancy administrations

The Education Technology initiative was developed as a comprehensive and cooperative endeavor involving the Ministry of Education and Social Welfare, the Ministry of Information and Broadcasting, the Indian Space Research Organization, and other relevant organizations. Emphasizing the significance of inter-agency coordination, methodical planning, scientific assessment, and efficient utilization, the project aimed to expand the advantages of technology to wide-ranging populations, especially those residing in rural regions. Its objective was to enhance the standard of education across all levels, minimize inefficiency and stagnation, and introduce novel teaching techniques and innovations.

A recent comprehensive survey was carried out by UNESCO's Information and Communication Technology (ICT) for Education program to determine the competencies that educators should acquire to employ technology in the classroom. In essence, the term refers to a broad range of communication technologies, including the internet, wireless networks, cell phones, satellite communications, digital television, computer hardware, network software, and related services and equipment like videoconferencing, email, and blogs that facilitate information access.

Challenges of use of Education Technology in India

India still has teething issues with the new technology in education, even with their early introduction into the system. Among them are:

> ➢ **Language Barriers:** India is a linguistically diverse country with hundreds of languages spoken. Many EdTech platforms are primarily available in English or a few major regional languages, leaving out vast segments of the population who are more comfortable in their native languages.
> ➢ **Quality of Content:** While there's a plethora of educational content available online, ensuring its quality and alignment with local curricula and learning objectives remains a challenge. Without proper duration and quality control, students may access inaccurate or irrelevant information.
> ➢ **Teacher Training and Support:** Teachers play a crucial role in integrating technology effectively into the classroom. However, many educators lack the necessary training and support to leverage EdTech tools optimally. There is a need for comprehensive teacher training programs to enhance their digital literacy and pedagogical skills.
> ➢ **Infrastructure and Connectivity:** Even when technology is available, unreliable internet connectivity and frequent power outages hinder the seamless integration of EdTech tools into the learning process. Building robust infrastructure and improving connectivity are essential to realizing the full potential of EdTech in India.
> ➢ **Pedagogical Integration:** Merely introducing technology into classrooms does not guarantee improved learning outcomes. Effective integration of EdTech requires aligning its use with pedagogical goals and teaching methods. Educators need support in designing curriculum-

aligned digital learning experiences that enhance student engagement and critical thinking skills.

➢ **Sustainability and Scalability:** Many EdTech initiatives in India are pilot projects or small-scale interventions that struggle to sustain themselves or scale up to reach a larger audience. Ensuring the sustainability and scalability of successful EdTech interventions requires long-term planning, adequate funding, and partnerships between government, private sector, and civil society organizations.

➢ **Cultural Context and Relevance:** Educational content and technology platforms must be culturally relevant and sensitive to the local context to resonate with students and educators. This includes incorporating indigenous knowledge, historical perspectives, and local examples into digital learning resources to make them more relatable and engaging.

➢ **Regulatory Framework:** The regulatory landscape for EdTech in India is still evolving, which can create uncertainty and barriers for both providers and users. Clear guidelines and policies are needed to ensure quality standards, protect consumer rights, and promote innovation in the sector while safeguarding against potential risks and misuse of technology.

➢ **Mindset and Resistance to Change:** Embracing EdTech requires a shift in mindset among educators, administrators, parents, and students. Resistance to change, fear of technology replacing traditional teaching methods, and skepticism about the efficacy of digital learning are common barriers that need to be addressed through awareness campaigns, capacity-building initiatives, and showcasing success stories.

➢ **Content Customization and Adaptation:** One-size-fits-all solutions often fail to meet the diverse learning needs and preferences of students. EdTech platforms must offer customizable and adaptive content that caters to individual learning styles, pace, and abilities, while also providing personalized feedback and support to maximize learning outcomes.

➢ **Digital Divide within Schools:** Even in schools where technology is available, there may be disparities in access and usage among different students or classrooms. Bridging the digital divide within schools requires equitable distribution of resources, ongoing technical support, and strategies to address socio-economic disparities that affect students' ability to benefit from EdTech interventions.

New technologies used in education also have negative aspects. The utilization of the latest technologies in education gives rise to numerous ethical questions and issues.

➢ **Loss of Human Interaction and Social Skills:** Over-reliance on technology-mediated learning environments may lead to reduced opportunities for face-to-face interaction and collaboration among students. This can hinder the development of essential social skills such as communication, teamwork, and empathy, which are crucial for success in both academic and professional settings.

➢ **Digital Divide in Teaching Staff:** While students may face barriers to accessing technology, educators themselves may also experience challenges in adapting to and integrating new technologies into their teaching practices. The digital divide among teaching staff, particularly in terms of digital literacy and proficiency, can impede the effective implementation of technology-enhanced learning initiatives.

➢ **Standardization and Loss of Individualization:** The implementation of educational technologies may lead to a standardized approach to teaching and learning, where the focus shifts from personalized instruction to uniform content delivery. This can undermine the diversity of student teaching styles, preferences, and abilities, potentially disadvantaging students who do not fit the mold of the "average" learner.

➢ **Technological Determinism:** There's a risk of overestimating the transformative power of technology in education, leading to a deterministic belief that technology alone can solve complex educational challenges. This overlooks the importance of socio-cultural factors, pedagogical practices, and human agency in shaping effective teaching and learning experiences.

➢ **Digital Exhaustion and Burnout:** The constant bombardment of information and digital stimuli in technology-rich learning environments can contribute to cognitive overload, mental fatigue, and burnout among students and educators alike. Balancing the benefits of technology-enabled learning with the need for mental wellness and self-care is essential for sustainable educational practices.

➢ **Unintended Consequences and Ethical Dilemmas:** The integration of new technologies in education may give rise to unintended consequences and ethical dilemmas that are difficult to anticipate or mitigate. This includes issues such as inadvertent reinforcement of stereotypes, unintended consequences of algorithmic decision-making, and unforeseen impacts on social dynamics within learning communities.

➢ **Globalization and Cultural Homogenization:** The widespread adoption of educational technologies may promote a standardized curriculum and pedagogical approach that prioritizes Western perspectives and cultural norms. This can lead to cultural homogenization and the marginalization of indigenous knowledge systems, languages, and cultural identities within the educational landscape.

➢ **Dependency on Tech Companies and Platforms:** Educational institutions may become increasingly dependent on tech companies and platforms for their infrastructure, software, and services. This dependency raises concerns about vendor lock-in, data sovereignty, and the erosion of institutional autonomy in decision-making related to technology procurement and usage.

➢ **Environmental Impact:** The production, consumption, and disposal of electronic devices and digital infrastructure associated with educational technologies have significant environmental implications. This includes the depletion of natural resources, energy consumption, electronic waste generation, and carbon emissions contributing to climate change.

➢ **Digital Divide beyond Access:** Beyond access to technology and internet connectivity, there's also a digital divide in terms of digital literacy, digital fluency, and digital citizenship skills. Students from disadvantaged backgrounds may lack the necessary skills to navigate online information effectively, critically evaluate digital content, and engage responsibly in digital environments.

➢ **Ethical Leadership and Governance:** Educational leaders and policymakers must grapple with complex ethical questions surrounding the use of technology in education. This includes establishing ethical guidelines and policies, promoting transparency and accountability in

decision-making, and fostering a culture of ethical leadership that prioritizes the well-being and rights of all stakeholders involved.

Conclusion

Innovation can diminish the huge exertion given by understudies to assemble several printed books and diaries for gaining information and increment understudies' attention to a more significant information-gathering process. Similarly significant, innovation can address schooling in manners that assist understudies with figuring out the most recent ideas and thoughts. The Schooling Innovation additionally empowers educators to incorporate task-based learning. With direction from powerful educators, understudies at various levels can utilize these apparatuses to build information and foster abilities expected in present-day society show abilities and insightful abilities. Right now the educator's part in educating is a facilitator. The instructor needs to work with the advancing by giving understudies admittance to innovation. The educators can track down the resources to connect with understudies all the more effectively in learning and to take care of the different requirements of various understudies.

Future of Education Technology

In India, while schooling advances seem to have been treated very a serious way by many state legislatures and by specific confidential area drives, the vast majority of these projects are pointed toward getting ready understudies for the gig market.

Also, the projects are programming-centric, for example, they stress the learning of a particular arrangement of programming apparatuses. There is an earnest need to demystify this innovation and de-stress the learning of explicit apparatuses. A reasonable nonexclusive educational program, where PCs are consigned to their due place as devices, and where they broaden the skylines of different subjects is an unquestionable requirement.

To empower innovation in India, PC based gaining framework should be presented from the lesser level so that the understudies become PC adroit from an exceptionally youthful age and are not scared of utilizing Instruction Innovation when All things considered required.

References

Jha, Nivedita, and Veena Shenoy. "Digitization of Indian education process: A hope or hype." *IOSR Journal of Business and Management* 18.10 (2016): 131-139.

Richey, R.C., 2008, Reflections on the 2008 AECT, Definitions of the Field.

Sinha, K. K. (2022). Role of modern technology in teaching and learning the English language in Indian educational institutions. *Indonesian Journal of English Language Studies (IJELS)*, *8*(2), 71-82.

Durham University News, 2012, ur.ac.uk/news/news item/?item no=15991

Cheney, Gretchen Rhines, Betsy Brown Ruzzi, and KarthikMuralidharan. "A profile of the Indian education system." *Prepared for the New Commission on the Skills of the American Workforce* 228.53 (2005): 128.

http://www.ncert.nic.in/new_ncert/ncert/rightside/links/pdf/focus_group/educational_technology.pdf

ICT in Education in India, 2012-13, http://www.icbse.com/ict-education

Research Findings and Implications for classroom Practice (Texas Instruments), 2005, http://education.ti.com/sites/US/downloads/pdf/CL2872.pdf

The National Policy on Education (NPE,)2009, www.ncert.nic.in/oth_anoun/npe86.pdf

Natarajan, Ramamurthy. "The Role of Technical Education in Enabling the Creation of a Knowledge Economy and Society: The Indian Experience "." *Creating Knowledge: Strengthening Nations: The Changing Role of Higher Education, University of Toronto Press, Toronto* (2005): 155-166.

Teaching with Technology, 2006, http://cte.uwaterloo.ca/teaching_with_technology

Recent Trends in Education, 2010 http://education.mapsofindia.com/recent-trends-education.html

Natarajan, Ramamurthy. "The Role of Technical Education in Enabling the Creation of a Knowledge Economy and Society: The Indian Experience" *Creating Knowledge: Strengthening Nations: The Changing Role of Higher Education, University of Toronto Press, Toronto* (2005): 155-166.

Gond, Rampravesh, and Rashi Gupta. "A study on digital education in India: scope and challenges of an indian society." *Anveshana's international journal of research in regional studies, law. SocSc J ManagPrac* 2.3 (2017): 12-18.