
The Role of Educational Technologies in the Digital Society: A Review

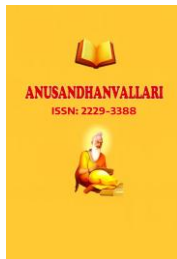
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It is not the strongest of the species that survive, or the most intelligent, but the one most responsive to transform.

Charles Darwin

Education as an essential activity in the development of society has seen major transformations, from which the new methods and models of the modern educational system have emerged. The relationship between the individual and society becomes more complex via education, as the individual gains the capability to make his contribution that would balance the benefits of his living among other individuals. In this context, education represents the basis of a society oriented education towards the futuristic goals as knowledge becomes the main component of the economic and social growth. Globalization and the changing world economy are driving a transition to knowledge-based economies. In particular, developing countries need knowledge-based economies not only to build more efficient domestic economies, but to take advantage of economic opportunities outside their own borders. In the social sphere, the Educational technologies bring greater access to information and new forms of social interaction and cultural expression. Individuals therefore have more opportunities to participate in and influence the development of their societies. Many countries around the world are investing in educational technologies to improve and update the education they provide their younger generations. Developed nations such as Canada, the United Kingdom and the United States are achieving students-per-computer ratios below 5:1, and their governments are deploying high bandwidth in schools. They are also consistently promoting research on the use of educational technologies inside the classrooms for many different educational, cultural and social settings. Developing countries are finding it increasingly difficult to compete with their present human resources in a global economy that regards information as an essential asset to design, produce and deliver goods for the changing consumer habits within a dynamic global market. Educational technologies play a major role for dealing with information and its transformation into knowledge, which is a basic requirement for citizens to become effective participants in this new scenario. Consequently, there is a more urgent need to improve the quality and equity of education to bridge the gap between developed and developing nations, and educational technologies are perceived as necessary tools for this purpose. Therefore, the development of the knowledge based society is dependent on the creation of knowledge, on its spreading via educational institutions and on its dissemination via communication and involvement in technological innovation. It is commonly thought that knowledge has replaced industrial organization and production as the major source of productivity. The term 'Digital Societies' generally refers to a society where knowledge is the primary production resource instead of capital and labor a stage of development where the main forces behind social advancement, economic expansion, and the general well-being of its citizens are the production, exchange, and use of knowledge made possible by information and communication technology. Globalization and the changing world economy had driven a transition to knowledge-based economies. In particular, developing countries need knowledge-based economies not only to build more efficient domestic economies, but to take advantage of economic opportunities outside their own borders. In the social sphere, the digital societies bring greater access to information and new forms of social interaction and cultural expressions. Individuals therefore have more opportunities to participate in and influence the development of their societies.



Characteristics of a digital society:

Applications of Technology for Prosperity: Digital technology is used to improve economic growth, competitiveness, and human situations.

Lifelong Learning: To fully participate in a digital technology-driven economy, education is a continuous process rather than a one-time event.

Equitable Access: Encouraging social cohesion and closing the "digital divide" by making Educational technologies available to all is the goal.

Information vs. Digital Technology: A digital technology society transforms information into knowledge, allowing for efficient and well-informed decision-making, whereas an information society might only focus on the generation of raw data.

High and steady innovation, as well as a workforce that is heavily involved in digital technology-intensive activities, are characteristics of this kind of civilization.

Compared to other civilizations, its members have attained a higher average level of education, and a growing proportion of its workforce is employed as Educational technologies workers, including scientists, researchers, information experts, knowledge managers, and other professions;

Computerized smart goods are produced by this industry.

Its organizations, which include governmental, business, and civil society organizations, have developed into sophisticated, learning institutions.

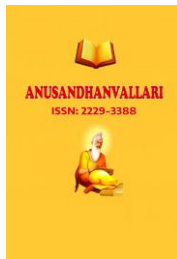
Digitized expertise, which is kept in data banks, expert systems, organizational plans, and other media, is a rising body of organized knowledge.

- There are several centers of competence and a polycentric method of producing Educational Technology ;
- In addition, the creation and use of Educational technologies are surrounded by a distinct epistemic culture. Technologies have been utilized by education ever since man started learning, but they have been massively present in schools only since the early 1980s. In terms of learning, it has been argued that a few subjects are being intrinsically changed because of educational technology. For example learning science is increasingly related to having access to scientific databases, with information-sharing over the network, and with the use of digital devices for data processing. Language and societal communications are being modified because of the presences of Internet (i.e. chats, e-mail, forums and digital newspapers) and of handheld devices with communication capabilities.

Developed countries have applied several strategies to develop knowledge societies :

A new society requires new skills: Educational Technology increasingly pervade every aspect of life (work, learning, leisure, and health) because these are the preeminent tools for information processing, new generations need to become competent in their use, should acquire the necessary skills, and therefore must have access to computers and networks during their school life. There is an equity issue in this argument related to the need to prioritize access to Educational Technology resources to the more underserved population, which is being left behind on a digital divide.

Productivity enhancement: Schools are information- and knowledge-handling institutions; therefore, Educational Technology should be fundamental management tools on all levels of an educational system, from classrooms to ministries.



A quest for quality learning: Schools should profoundly revise present teaching practices and resources to create more effective learning environments and improve life-long learning skills and habits in their students. Educational technologies are versatile and powerful tools that can help in this purpose and should therefore be present in every classroom, library and teacher room. It must be said, Educational Technology has provided a large-scale breakthrough in learning improvements. They are still promises with great potential.

Developmental Role of Educational Technology

Increasingly, countries across the globe are embracing a vision for development of knowledge and adopting policies and strategies to encourage this development. Educational Technologies are of vital importance in Education, as a source of basic skills, as a foundation for development of new knowledge and innovation, and as an engine for socio-economic development. A digital technology has knowledge as its primary production resource, and as such has shifted, or is shifting to, a knowledge-based economy. It is a society that creates shares and uses knowledge for socio-economic development. As such the education and skill levels of the people in these societies are the key indicator of its wealth. High proportions of its populations are employed as knowledge workers. This sees shifts in the way knowledge is accessed, created and used in the society and traditional barriers between the workplace and the formal places of learning are eroded. This is not just about the availability of information, but its effective selection, evaluation and use to solve societal and economic problems. Everyone is a learner and reflective practitioner: employers, employees, students and academics or teachers. A necessary requirement – although not a sufficient condition – for such a society is digital technology. It is therefore, a critical requirement in creating knowledge societies that can stimulate development, economic growth, and prosperity. It is not only the means by which individuals become skilled participants in society and the economy, but is also a key driver expanding Educational Technology usage. Education technologies are faced with a need to provide formal instruction in multimedia as well as in how to create meaningful content with today's tools. However, it is important to consider expanded definitions of this literacy that are based on mastering underlying concepts rather than on specialized skill sets. Education systems need to develop and establish methods for teaching and evaluating these technical literacy at all levels of education.

The past ten years has seen an unprecedented explosion in educational technology, leading to a sometimes bewildering array of new technological options that can be harnessed to support education, in its managerial and administrative operations, in teaching and learning, and in research. Learning in the knowledge-based society is considered to be holistic, as it is a lifelong activity and cuts across different learning generations and life spheres, the potential impact of Educational Technology on learning is the vision that it enables learning 'anywhere, anytime, and anyhow'. With educational technology, knowledge is not constrained by geographic proximity, and offers more possibilities for sharing, archiving, and retrieving knowledge. In addition, the widespread uses of Educational Technology generates a need for new digital skills and competences for employment, education and training, self-development, and participation in society. Educational Technology has potential to widen access to educational resources, improve the quality of learning, and improve management efficiencies of the education system. In Educational technologies because of Educational Technology there is a professional, pedagogical and organizational jump for teachers, which further helps in the development of knowledge-society attributes among students, including higher order thinking skills, lifelong learning habits, and the ability to think critically, communicate, and collaborate, as well as to access, evaluate, and synthesize information. One should try to design technology which appropriates to their actual work rather than technology which embodies our teachers' beliefs about what students should be doing.

Explosion of Technologies

Of course, harnessing technologies for education purposes to create blended learning – including gaming, virtual reality, text messaging, and social networking sites – requires continued investment in supporting academics and teachers to create and sustain these new learning environments. There has been an explosion in collective sharing and generation of knowledge as a consequence of growing numbers of connected people, and the proliferation of so-called Web 2.0 technologies. Consequently, collective intelligence and mass amateurization are pushing the boundaries of scholarship, while dynamic knowledge creation and social computing tools and processes are becoming more widespread and accepted.

Educational Technology and Shift from Content as a Product to Content as a Service

This trend is clearly seen in the emerging concept of Open Education Resources (OERs). In a nutshell, the concept of OERs describes educational resources that are freely available for use by educators and learners, without an accompanying need to pay royalties or license fees. A broad spectrum of licensing frameworks is emerging to govern how OERs are licensed for use, some of which simply allow copying others which make provision for users to adapt the resources that they use. However, the concept of OER has also gained momentum as some people see its potential transformative power for education.

The Accelerating Obsolescence of data: Traditional textbooks cannot keep up with the rapid evolution of fields like technology, health, and business. Instantaneous curriculum modifications are made possible by SaaS models (Software as a Service) model delivers software applications over the internet on a subscription basis.)

Intelligent customization through AI: In contrast to one-size-fits-all content, contemporary platforms use generative AI to provide dynamic, real-time adaptability, customizing exercises and explanations to a student's current performance.

Incessant response spheres: Providers are now using active improvement instead of a "sell and forget" strategy. They continuously improve their solutions to reduce attrition and increase learning efficacy by monitoring engagement analytics and completion rates.

Educational Technology and Changing Skills Requirements

The skills landscape is changing as a result of Educational Technology, which is shifting from rote memorization to digital literacy, analytical reasoning, and lifelong learning. Educational institutions and corporate training programs are using digital platforms to promote sophisticated problem-solving, teamwork, and agility in order to meet the needs of the modern workforce. EdTech is radically changing the educational landscape by bridging the gap between conventional education and the demands of the modern labor market.

Personalized learning: where AI-powered tools and online resources adjust to each user's speed and assist professionals and students in gaining specialized knowledge, is one of the main forces behind this change. Thus the growth of knowledge societies has placed increasing emphasis on the need to ensure that people are 'tech-savvy' the ability to read becomes particularly important in economic disequilibria when people must process new information to learn new routines. As computer technology and increased global competition accelerate the rate of economic change the need for reading has increased correspondingly. Similarly the faster pace of change has also increased demands for writing.

Digital savviness: Programming, data analytics, artificial intelligence, and the development of multimedia material are becoming more and more important in today's educational environment, making basic computer literacy insufficient.

Interpersonal Development: In regulated virtual environments, users can successfully develop teamwork, communication, and crisis-management skills using immersive simulations, virtual reality (VR), and collaborative digital tools.

Worldwide ease of access and Micro-credentialing: Massive open online courses (MOOCs) and online learning platforms give people the ability to continuously learn and validate new abilities. The reliance on email



to exchange information rapidly similarly requires the ability to write clearly and persuasively, Because of computerization, the use of abstract models now permeates many jobs

Educational Technology and the Changing Role of Educators

Assuming that, notwithstanding the many challenges, it will become increasingly easy to create educational environments where the online world is seamlessly and ubiquitously integrated with the physical campus, students will face a new set of educational challenges. They are able to learn these skills themselves without much, if any, guidance. However, as they learn the skills of using technology in education, the professional role of teachers as mentors – able to impart the wisdom that only experience can provide – will grow in importance. Thus, it is becoming essential for teachers to provide this mentoring. Here are few key ways in which educators will need to be able to mentor and guide learners in this environment. Fostering coherence and discipline in thinking. Establishing personal boundaries and ethical standards is made possible in a society when choices are limitless. Decision fatigue frequently results in tension and overload since our thoughts aren't equipped for an infinite number of possibilities. To combat this, make decisions based on your basic values, put "satisficing" ahead of perfection, and consciously restrict the amount of information you consume each day. Encouraging students Transitioning from passive knowledge consumption to experiential, project-based learning is essential to empower them as creators. By encouraging students to build, problem-solve, and showcase their work, educators foster deeper comprehension, critical thinking, and a greater sense of ownership over the learning process.

Educational Technology and Materials Development

The provision of materials for learning is considered critical for the successful integration of technology in education. Britain holds an annual competition for digital content development. Criteria used to evaluate these materials are design, cost-effectiveness, support of higher order skills and effective learning and teaching styles, and technical robustness and resilience, as well as accessibility for groups with specific needs. Australia has a robust environment in digital content, The Enlaces Programme in Chile created a website which offers educational content and services for teachers and students. The website is seen as an educational portal where teachers can access curriculum-oriented content and up-to-date educational information. Furthermore, in the examples of technologies such as blogs and wikis, users are actively encouraged to add to and shape all of the content within the community, rather than 'owning' their own content and simply reading other people's content.

Educational Technology and Infrastructure

The field of Educational Technology and its accompanying infrastructure depend on quick networks, dependable devices, and unified software solutions to improve and customize educational experiences. To solve issues like data bias, security flaws, and uneven access, educational institutions should prioritize seamless interoperability, digital justice, and professional development for educators. Infrastructure encompasses access to equipment as well as to connectivity. Trends indicate that rapid advances in technology have continued to add potential to the use of wireless technology, it is becoming more pervasive and cost-effective, and telecommunications liberalization is occurring globally, although at a slow pace. Mobile Internet centers are also being deployed as a way to reach rural areas. Community tele-centres (sometimes based in schools) are also regarded as important tools to provide access to learners (including teachers engaged in personal enrichment and professional development opportunities) to ICT outside of formal school settings. The use of new multimedia technologies and the Internet helps to improve the quality of learning and facilitates access to resources and services as well as remote exchange and collaboration.

Ed-Tech inventiveness at the National and International Level Standardized Digital Public Infrastructure (DPI) and inclusive, localized Ed-Tech ecosystems are becoming more and more important to governments and international organizations.



In India: To provide uniform, interoperable public frameworks, local initiatives spearheaded by the Ministry of Education include platforms like DIKSHA (Digital Infrastructure for Knowledge Sharing), SWAYAM (massively integrated with MOOCs), and NDEAR (National Digital Education Architecture).

Global scaffold: To manage AI integration safely and guarantee data privacy and affordability across various educational systems, the World Bank and UNESCO actively put stress on the necessity for robust public supervision.

Rapid Connectivity: To avoid disruptions in the classroom, it is essential to implement scalable broadband, enterprise-grade Wi-Fi throughout the campus, and backup internet connections.

Educational Platforms & Cloud Services: Reliable Learning Management Systems (LMS) paired with Single Sign-On (SSO) integration enhance access and lessen the workload on IT personnel.

Student Devices: To control expenses and maintain privacy standards, school districts are increasingly adopting safe, cloud-based, and budget-friendly hardware such as Chromebooks.

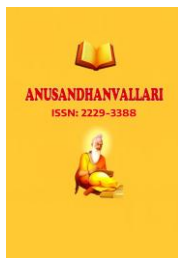
Innovative Technologies:

Through the utilization of data-driven LMS systems, immersive VR/AR environments, and AI-driven customization, modern educational technology is transforming learning. These innovations enhance accessibility, critical thinking, and student engagement by substituting active, individualized learning for rote memorization. Platforms leverage AI as personal teachers, assessing learning patterns to pinpoint areas of strength and weakness. This method makes it possible to adapt instruction to each student's needs and pace, which is especially beneficial for children who require specialized methods. One AI-powered platform that offers personalized, adaptive learning is Carnegie Learning. 3D printers, Interactive Flat Panels (IFPs), Virtual/Augmented Reality (VR/AR) tools, and creation kits like Raspberry Pi and Arduino are examples of how modern educational technology has progressed beyond basic computer laboratories. Complex subjects can be taught in safe, engaging, and interactive environments using virtual reality (VR) and augmented reality (AR). Platforms like Labster allow students to participate in virtual science activities, and augmented reality apps allow digital content to be seamlessly connected to the physical environment. Students are more motivated in the classroom when game components like challenges, points, and prizes are included. Platforms like Kahoot! turn lectures and exams into competitive, interactive games that promote intrinsic learning. Canvas and Moodle are examples of current platforms that make it easier to distribute course materials, expedite administrative tasks, and track student progress. They employ data analytics to help teachers identify challenging students and enhance their teaching strategies by recognizing learning patterns.

Educational Technology and Professional Development

There is a great interest in participatory approaches to professional development where educators are involved in initiating and designing their own professional development and would share materials and ideas and discuss challenges and solutions. This approach will also help teachers to become model lifelong learners. Case studies have indicated that a model of learning by doing may be a good starting point for initiating forms of future staff development linked to school-based curriculum. Training has been an important element of Indian efforts in deploying technologies for education and exposure to computers and training in the use of computers form part of professional education. Implementation of training is focused on trainers, producers of content, field level facilitators, and other key personnel

Thus it can be concluded that for Educational technologies to be realized, supported, and further developed, education and innovation should be viewed as interrelated drivers for socio-economic development, in a context where Educational Technology are an enabler for both innovations and education.



This shift in the conceptualization of education, development and digital technology, from being distinct pillars to being interrelated and enabling drivers of socio economic development has several implications

1. Education is a lifelong activity and cuts across different learning generations and life spheres (private, public, and work) that can no longer be confined to investments in schools and universities. Likewise, education can no longer be dichotomized as face-to-face or distance education.
2. Teaching through technology is no longer considered, as higher order skills of how to participate in Educational Technology as citizen, worker and scholar are required.
3. Skills requirements for students and teachers as well as administrators change – and keep changing - in the era of digital technology.
4. Educational Technology can be used to tackle some of the challenges facing education and be a key driver of development strategies, but requires sustained investment and strong alignment with systemic changes (in education, service delivery, and/or economic productivity).
5. Educational Technology can be regarded as a potent tool in reducing poverty, extending health services, expanding educational opportunities, and generally improving the quality of life.
6. Participation in regional and continental initiatives to harness Educational Technology for all round development can streamline and support national efforts.

Essential Components for Effective Implementation of Educational Technologies

Without careful planning, using technology is pointless. The ISTE (International Society for Technology in Education) recommends that educational institutions concentrate on the following areas:

Competent Teachers: By offering continual professional development and technical support, educators may minimize the challenges associated with technology issues and make efficient use of new tools.

Equitable Access: This guarantees that all student populations, including those with physical or learning disabilities, have access to devices, dependable connectivity, and digital resources.

Ongoing Evaluation: To ensure that technology serves the school's main educational goal, the integration and instructional impact of digital tools are regularly assessed.

Conclusion:

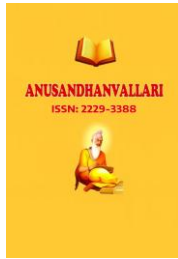
Educational Technology is the foundational pillar of the digital society, transforming learning from a localized, static event into a continuous, globally connected experience. By expanding access, personalizing instruction, and fostering essential digital literacy, these tools empower individuals to navigate and thrive in an increasingly complex, technology-driven workforce. The foundation of our digital environment is educational technology, which transforms education from a limited, static event into a continuous, globally networked process. These solutions help people succeed in an increasingly complex, technology-driven labor market by boosting accessibility, personalizing learning experiences, and fostering critical digital competency. Geographical and physical barriers are eliminated by digital platforms, giving students access to excellent resources and knowledge from anywhere in the world. By tailoring instructional materials to each student's unique learning preferences, pace, and skill gaps, adaptive learning frameworks and AI-powered analytics improve student achievement. Students are guaranteed to gain the critical problem-solving and technological skills needed in today's global economy through the integration of tools like cloud-based collaboration, coding environments, and virtual simulations. Massive open online courses (MOOCs) and micro-credentialing systems facilitate ongoing skill development, enabling workers to adapt to rapid technological advancements throughout their careers. Technology has transformed education by boosting teamwork, promoting interactive and customized



learning experiences, and increasing accessibility. As we continue to embrace technology advancements, we must make sure that they are used effectively and morally, making the most of their potential to improve education for all. The ongoing development of technology in education offers tremendous potential for creating a more welcoming, engaging, and effective learning environment for both current and future students. Technology fosters a more connected and cooperative learning environment by facilitating communication and collaboration between students and teachers. Students can work together on tasks, share ideas, and gain knowledge from one another using social networks, digital forums, and collaborative tools. Teachers can also use these tools to interact with parents and children, providing performance reports and quickly resolving concerns. In addition to improving the educational experience overall, this increased engagement fosters a sense of community between teachers and students. Education is by its very nature a collaborative process. Pupils come from a variety of backgrounds. Both the teacher and the student actively participate in the discussion, which transforms and improves both parties' understanding and assesses their level of subject-matter comprehension; through the methodical approach of cooperative learning, students work together in small groups to solve a common problem. Students cannot remain passive spectators in group dynamics since everyone's contribution is essential. In many areas of human endeavor, group cooperation is becoming a more prevalent organizational strategy.

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