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Impact of Technology in Teaching and Learning

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ஆய்வுச் சுருக்கம் - தொழில்நுட்பத்தின் ஒருங்கிணைப்பு நவீன கல்வியில் ஒரு மாற்றுவித்தியாசமான சக்தியாக உருவெடுத்துள்ளது. இந்த ஆய்வு, டிஜிட்டல் தொழில்நுட்பங்களின் கற்பித்தல் மற்றும் கற்றல் மீதான பன்முக தாக்கங்களை ஆராய்கிறது. மாணவர் மையக் கல்வி முறைகளும் அவற்றின் ஊடாடல் நிறைந்த, தகவமைக்கும் தன்மையுள்ள கற்றல் சூழல்களை உருவாக்கும் திறனும் இதன் முக்கிய கவனக்குவிப்பாக அமைகின்றன. டிஜிட்டல் கருவிகள் கற்பவர்களை அவர்களின் தனிப்பட்ட பாணி, விருப்பம் மற்றும் திறன்களுக்கு ஏற்ப கல்வி அனுபவங்களை இணைத்துக்கொள்ள உதவுகின்றன, இதனால் கற்றல் செயல்முறையில் அதிக ஈடுபாடும் தனிமயமாக்கலும் ஏற்படுகிறது. டிஜிட்டல் தளங்கள் உலகளாவிய இணைப்பையும் கூட்டுக் கற்றலையும் மேம்படுத்துகின்றன. மெய்நிகர் வகுப்பறைகள் மற்றும் கற்றல் மேலாண்மை முறைமைகள் போன்ற கருவிகள் புவியியல் ரீதியாக விரவியிருக்கும் கற்பவர்களிடையே நிகழ்நேர தொடர்பை எளிதாக்குகின்றன. ஊடாடல் உருவகப்படுத்துதல்களும் கல்வி பயன்பாடுகளும் அனுபவ ரீதியான மற்றும் காட்சி வழிமுறைகளில் ஆழமான கருத்தியல் புரிதலை ஆதரிக்கின்றன. தொழில்நுட்பம் உள்ளடக்கிய கல்வியை முன்னேற்றுவதிலும் முக்கிய பங்கு வகிக்கிறது — விளிம்பு நிலையினருக்கும் பன்முக பின்னணியினருக்கும் தரமான கல்வி வளங்களை அணுகுவதற்கான வாய்ப்புகளை வழங்குகிறது. எனினும், டிஜிட்டல் திசைதிருப்பல், அதிக சார்பு, நியாயமற்ற அணுகல் மற்றும் அதிக திரைக்காட்சி நேரம் போன்ற சவால்களும் உள்ளன. தொழில்நுட்பத்தை கற்பிக்கும் முறை அடிப்படையிலும் சமச்சீரான முறையிலும் செயல்படுத்தும்போதே அதன் செயல்திறன் அதிகமாகிறது.

ABSTRACT - The integration of technology in modern education has emerged as a transformative force that reshapes and redefines the roles of both teachers and learners. This study examines the multidimensional impact of digital technologies on teaching and

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learning, with a particular focus on student-centred pedagogies and their capacity to create interactive, adaptive, and multifaceted learning environments. By enabling learners to align educational experiences with their individual styles, preferences, and abilities, technology fosters greater engagement and personalisation in the learning process. Furthermore, digital platforms play a significant role in promoting global connectivity and collaborative learning. Tools such as virtual classrooms and learning management systems facilitate real-time interaction among geographically diverse learners, thereby enhancing cross-cultural understanding and preparing students for global citizenship. Similarly, interactive simulations and educational applications support deeper conceptual understanding by offering experiential and visual modes of knowledge acquisition that extend beyond traditional textbooks. The study also highlights the role of technology in advancing inclusive education. Digital tools provide opportunities for learners from marginalised and diverse backgrounds to access quality educational resources, thereby reducing barriers to participation. However, the integration of technology is not without challenges — digital distraction, overdependence on technological tools, inequitable access, and excessive screen time raise critical concerns. The effectiveness of educational technology is therefore contingent not merely on its availability but on its pedagogically informed and balanced implementation.

KEYWORDS: *Modern technology, Digital tools, Technology-mediated learning, Virtual classrooms, Learning management systems*

INTRODUCTION

In the present era, technology has become an inseparable part of daily life, and its impact on education has been equally profound. The classroom was once centred around textbooks and lectures, but in the digital age the education sector has evolved towards an environment that facilitates interactive learning. Today, technology is no longer a supplement to education but an essential form of literacy that determines how knowledge is acquired, processed, and applied.

The use of technology in teaching and learning has enhanced educational practices in ways that make education more accessible and more efficient. It allows teachers and students to step beyond the four walls of traditional classrooms. Technology makes education an interactive and collaborative process that gives meaning to learning. In this new era, education is no longer an all-or-nothing proposition. Technology in education significantly modifies pedagogy by enabling students to chart their own path based on their individual requirements.

TECHNOLOGY AS A NEW FORM OF LITERACY

In today's world, being digitally literate is as important as holding an academic degree. Students are not only expected to learn academic content but also need to use, understand, and manage digital technologies. They must possess a working knowledge of computers, online platforms, educational applications, and digital communication tools in order to excel academically and secure meaningful employment. Learners are thus equipped with technology to prepare for life and livelihood in a future-ready society.

The classroom has become a training ground for vital digital skills, including the use of productivity tools, data management, and digital communication — all of which reflect contemporary workplace expectations. Integrating technology in education also promotes self-directed learning. Through the internet, students can access unlimited information, explore topics beyond the syllabus, and develop research skills. This shift encourages learners to transition from passive recipients to active participants.

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As Stošić (2015, p. 113) observes, educational technology motivates students to work independently, as modern technical equipment is widely available at any given moment.

One of the most significant impacts of technology is that it allows learners to personalise their learning. Traditional classes are generally inflexible in accommodating diverse student needs. Digital platforms address this limitation effectively; students can access learning materials at any time and at their own pace. This flexibility is particularly advantageous for students with different learning abilities. Hybrid and blended learning models, which incorporate both online and face-to-face instruction, offer greater flexibility and foster self-directed learning. Digital learning tools especially benefit students with learning difficulties, thereby lowering the risk of academic disengagement and making education systems more equitable.

The nature of teaching and learning materials has also been transformed by technology. Where learning once relied almost exclusively on textbooks, today a range of video, audio, simulation, and interactive quiz resources is employed to encourage active student participation. Gamification makes learning engaging and motivating, thereby improving retention. Visual and auditory materials simplify complex ideas and render them accessible to a broader range of learners.

Another significant advantage is global connectivity. Technology has dissolved geographical barriers, enabling students to connect with peers, educators, and subject experts worldwide. Digital collaborative platforms such as Empatico, iEARN, PenPal Schools, Padlet, and Google Workspace facilitate classroom exchanges, project-based learning, and shared creative work. This borderless collaboration promotes cultural awareness, communication skills, and problem-solving competencies, preparing students to engage effectively in a globalised world.

IMPROVING TEACHING EFFICIENCY AND CRITICAL THINKING

Technology benefits not only students but also enhances the effectiveness of teachers. Artificial intelligence tools such as MagicSchool, NotebookLM, and TeachShare assist educators in curriculum planning, lesson preparation, and the creation of presentation and audio-visual materials. Digital tools such as Cograder simplify grading, attendance tracking, and performance monitoring. These tools provide immediate feedback, enabling teachers to identify learning gaps promptly and take corrective action. By reducing the burden of routine administrative tasks, they allow educators to dedicate more time to designing instructional materials that meet diverse student needs.

Technology also encourages students to think critically. By engaging with analytical tasks and applying acquired knowledge to real-life scenarios through interactive simulations and virtual environments, students build a deeper understanding of subject matter. This shift transforms the classroom dynamic: rather than being passive listeners in a traditional lecture setting, students actively engage with content, interact with peers, and explore solutions independently. This transition from passive reception to active participation represents one of the most significant strengths of digital integration in education.

NAVIGATING THE CHALLENGES

Notwithstanding its many advantages, the integration of technology in education is not without challenges. Teachers from older generations may face difficulties adapting to rapidly evolving technologies. Stošić (2015, p. 113) notes that older teachers did not have the possibility of training with modern technical appliances or access to educational technology during their studies. Targeted professional development, workshops, and ongoing training programmes can help bridge this gap.

Digital distraction remains one of the most common issues among students. With the abundance of online content, students can easily lose focus on their academic work, adversely affecting overall productivity. There is also a risk of overdependence on digital devices: if students rely too heavily on technological tools, they may struggle to develop independent problem-solving abilities, potentially reverting to passive patterns of information consumption.

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Another significant concern is the digital divide. Not every student has access to high-speed internet or the latest devices, particularly in rural or lower-income areas. This inequity in access affects both students and teachers; without adequate infrastructure and training, educators cannot fully integrate technology into classroom practice. Gaxhiqi (2023, p. 125) argues that improvement must be pursued within the ICT infrastructure in educational institutions, through teacher training and qualification, development and standard setting, and application of best practices. Educational institutions must also prioritise cybersecurity, ensuring that student data is kept private and used ethically in an increasingly connected world.

CONCLUSION AND RECOMMENDATIONS

Technology has fundamentally transformed the way people teach and learn, making education more interactive, accessible, and personalised. However, for this integration to be genuinely effective, it requires careful planning and a balanced approach. Specifically, technology should be embedded within the core curriculum rather than treated as an optional supplementary tool. Regular professional development workshops are essential to enhance teachers' digital competencies and keep them current with technological advancements.

To avoid overdependence, a combination of digital and traditional teaching methods must be maintained. Institutions and stakeholders must collaborate to bridge the digital divide by ensuring that all students have access to the necessary resources. Clear guidelines on data privacy and cybersecurity are indispensable to protect student information. When implemented under these conditions, an education system can become inclusive, engaging, and future-ready. Technology, when used effectively and responsibly, becomes a powerful asset that equips students to succeed in an increasingly digital world.

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