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A Comprehensive Review of Technology-Enhanced Teaching and Learning Experiences

Md. Arfan Khan Sohan[1*], Sanjida Alam Orpa[2]
[1,2]Department of English and Humanities, University of Liberal Arts Bangladesh, Bangladesh

***Correspondence Email : arfankhansohan1997@gmail.com**

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Abstract

In higher education practice, technology is transforming how students learn and are taught, improving access, involvement, and personalization. There is still uncertainty about the long-term implications of technology integration and its impact on equity. The review aims to show how technology tools (e.g., AI, mobile, VR, and LMS) enhance teaching effectiveness and student learning. Thematic analysis, as outlined by Braun and Clarke (2006), was used to identify and analyse patterns within the data. To conduct this review transparently, a thematic analysis was applied to 46 articles published between 2003 and 2025. Themes presented include student engagement, AI personalization, immersive experiences, and mobile or blended learning design. The findings summary highlighted technology-enhanced instructional delivery, adaptive learning, and digital literacy, while also fostering critical thinking. While promising, issues of digital inequity, limited teacher training, and the integration of digital tools into curricula were still acknowledged. Ultimately, the study revealed that educational technology can enhance student engagement, foster personalized learning opportunities, and promote greater flexibility and immersion. However, this technology needs an enabling digital infrastructure, responsive teachers, and differentiated or sustained curricula. The study suggested that strategic planning, political support, and professional development are necessary to effectively integrate educational technology and achieve inclusive learning environments that enable future-ready students to maximize their learning.

INTRODUCTION

Technology has transformed education by increasing student engagement, personalizing learning, and allowing for information retention (Abaricia, 2023). Digital tools, including adaptive learning platforms, mobile learning, virtual reality, and artificial intelligence, have enhanced accessibility, engagement, and the quality of education (Haleem et al., 2022; Lopez et al., 2021). The impact of COVID-19 accelerated the transformation of education, requiring educators to utilize technology to support the educational process (Winter et al., 2021). Technology can benefit education and learning through various online learning opportunities and methods (Aad, 2025). However, concerns persist regarding equity and the digital divide, teacher training, and the potential for screen fatigue among learners (Akintayo et al., 2024). As education continues to integrate technology, it is essential to investigate the implications of technological advancement on teaching and learning

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strategies and how to improve learning outcomes. This thematic review integrates research on technological platforms and tools to explore potential implications for teaching and learning (Goh, 2020). Technology has a significant impact on teacher professional development, pupil engagement, and instructional outcomes (Ding et al., 2024; Smith, 2021). Several research gaps exist, including the limited empirical studies that investigate the long-term impacts of digital and AI-supported learning (Ravshanovna, 2025).

Technological advancements have made the learning and teaching experience more effective and efficient across the school landscape. Students are more motivated and engaged and can recall knowledge better due to the enhanced learning experience afforded by gaming, LMS, and AI-driven customized learning (Garcia, 2022; Brown, 2022). In higher education, the use of mobile learning platforms has made learning materials more widely accessible (Harris, 2023). Similarly, in research, VR and AR have been shown to create an engaging and immersive educational experience, leading to higher levels of critical thinking, collaboration, and communication (Martinez, 2023; Patel, 2021). Nevertheless, the educational effectiveness, accessibility, and digital literacy of technology interventions are further points for discussion (Taylor, 2022). The specific role of generative AI in academic course development and faculty development requires more attention (Ravshanovna, 2025). The general effects of the digital learning environment on cognitive development and student motivation have not been well-researched (Shamshul et al., 2024). There is a gap in research on how emerging technologies will play a significant role in future teaching and learning methods. The impact of technology on teaching and learning forms the basis of a thematic review of the applications of LMS, AI-driven personalized learning, mobile learning, and VR in education. (Evans, 2022). The outcome of these findings is meant to assist educators and researchers in selecting technology for educational purposes. These are the research questions,

RQ 1: How does technology enhance teaching effectiveness?
RQ 2: What are the student learning outcomes in educational settings?

METHODOLOGY

This review employs a thematic analysis strategy to investigate the role of technology interventions in enhancing the teaching and learning experience in higher education contexts. The review identified a total of 46 peer-reviewed articles that investigate different aspects of technology use, including artificial intelligence, mobile learning, gamification, digital learning environments, and immersive technology using virtual or augmented reality (Abaricia, 2023). A systematic review of the literature was conducted using reputable sources, including those from Google Scholar, ERIC, ResearchGate, and JSTOR, to gather literature supportive of the review. The search terms of interest included “educational technology,” “digital learning tools,” “AI-ed,” and “technology in teaching”. The review first identified studies published between 2003 and 2025 that explored both more traditional and newer studies on the role of technology in education. Studies were considered for inclusion if they focused on, at minimum, implications for technology in the teaching and learning experience, and were peer-reviewed (Shamshul et al., 2024). Exclusions for studies included those focused on education outside higher education contexts, provided no empirical support, and relied solely on opinion. Ultimately, only high-quality, relevant literature was included (Patel, 2021).

Thematic analysis was utilized to categorize and synthesize themes from the appraised literature. Thematic analysis, as outlined by Braun and Clarke (2006), was used to identify and analyze patterns within the data. The initial step in the analysis was to carefully read, analyze, and extract key findings from each of the articles. After reading the articles, the extracted findings were grouped and organized into identified findings and more general themes (Thompson, 2019). Ultimately, four wider themes were identified: technology and student engagement; artificial intelligence and personalized education; immersive and interactive learning experiences; and mobile and blended learning designs. The literature provided evidence that promoted engagement and

learning (Smith, 2021; Abaricia, 2023); AI technologies (e.g. adaptive learning and automatic feedback) offered engagement and individualization of learning (Garcia, 2022; Ding et al., 2024), immersive learning environments such as virtual and augmented reality facilitated the design for an experience in experience-based learning (Patel, 2021) and mobile and blended learning designs (Evans, 2022) offered flexibility to promote individualization and access (Harris, 2023; O'Connor, 2023). As such, the themes were refined to ensure the development of a clear and cohesive synthesis of the literature for the study.

To preserve the integrity of the work, reference entries were completed according to the APA 7 guidelines, and limited quotes were utilized to uphold the writing process values of originality, ownership, and authorial authority. This review is comprehensive; however, it has limitations. An underlying limitation may stem from the fact that all articles were published in English, which may have resulted in the omission of perspectives or research from non-English studies. The limitations of this review can provide an organized framework for discussion of the role of technology in education, lessons learned from technology in education, and suggestions for future research.

FINDINGS

The emergence of technology has undoubtedly created a substantial change in teaching and learning, as it has become an integral part of educational experiences. Different types of technology, such as technology-mediated blackboards and learning management systems, as well as personalized artificial intelligence training and virtual simulations, present opportunities for learning environments to be fundamentally transformed. Unlocking increased access to learning resources, enhancing student engagement, facilitating differentiation, and helping teachers improve their teaching are all benefits of using technology in the classroom. This review organizes the literature across some key themes that describe how technology can enhance the teaching and learning experience. Technology has emerged as a major force for change in education, reshaping the landscape of teaching and learning. Recent research increasingly supports the idea that technology can be used as a means to enhance student engagement, improve instructional practices, and facilitate personalized learning. It discussed potential barriers to technology use, including equity of access and teacher training, which still exist; however, as digital tools and research continue to evolve, there will inevitably be exciting developments around what this could mean for educators and students in the future. As schools adopt new ideas in education, technology will play a significant role in the foundations of developing more inclusive, equitable, effective, and dynamic learning environments.

Technology enhancing teaching effectiveness

The relevant findings are presented under subheadings.

Digital tools and instructional strategies

Various digital tools have been integrated into the field of education. Learning Management Systems (LMS), interactive whiteboards, and flipped classroom methods are technologies that have been integrated into education, bringing about a revolution in educational practices (Abaricia, 2023). The article by Foster (2020) focused on flipped classrooms being advantageous to education (Ding et al., 2024; Babo et al., 2021), because it means that students will engage in a lower percentage of fading (Haleem et al., 2022; Lopez et al., 2021), as lectures were the primary delivery method, and manipulable technologies allow for collaborative learning (Barana, 2020; Harris, 2023). Roberts (2020) also emphasized that interactive whiteboards are manipulable technologies that offer visual and kinesthetic learning and engagement (Taylor, 2022; Hughes et al., 2019), resulting in improved classroom engagement (Khosravi et al., 2021). These technologies have also allowed teachers to differentiate instruction more effectively, gain more control over content distribution (Hasan et al., 2025), respond to students on time (Ding et al., 2024), and a lot of other attributes that have had a positive overall influence on the quality of education provided (Harris, 2023).

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Professional development and teacher readiness

To achieve success, technology integration largely depends on the degree of preparation and digital literacy achieved by teachers, as noted by Abaricia (2023). Ding et al. (2024) revealed that the vast majority of teachers still chose to apply their experiences rather than the information provided by AI. The reasoning behind this was that, in general, there is limited information available about artificial intelligence. Accordingly, Braun (2006) suggested developing training models to ease the transition to using artificial intelligence (AI) tools by forming a connection between AI tools and the identity of the teacher personas. The training models included Navigator, Collaborator, and Inventor (Haleem et al., 2022; Lopez et al., 2021). The pandemic highlighted the existence of inequities in teachers' digital literacy, revealing systemic deficiencies in training and resource provision, according to Ravshanovna (2025). Winter et al. (2021) addressed the issue in a public forum. Islam et al. (2024), in their study titled "EFL teachers' perceptions of artificial intelligence (AI) and implications for academic integrity and academic practice in Bangladeshi universities," outline the convergence of AI tools and classroom practice, addressing AI's role in terms of academic integrity.

AI and automation in teaching processes

Artificial intelligence (AI) has emerged as a tool in recent years, enabling advanced technology to enhance the learning process. Examples of this interest include providing immediate feedback, enabling adaptive testing, and enhancing predictive data analytics. Everything Garcia (2022) described about the potential of AI-based platforms and improving education through pathways created by real-time performance data fits this narrative. Another use Lopez et al. (2021) provide evidence that artificial intelligence hinders the development of personalized learning programs, as well as increased purpose (therefore engagement by students), while arguably providing instructors with added features to save time (Taylor, 2022). After the study, this was also one of the conclusions (Ding et al., 2024; Babo et al., 2021). A reminder to discuss their contributions in their area. Uddin et al. (2024) conduct a phenomenological study on the perception of university EFL teachers toward AI-enhanced e-assessments in Bangladesh (Taylor, 2022; Hughes et al., 2019). The study, published in Bulletin of Advanced English Studies, details the teacher's lived experience regarding the integration of AI in evaluation. Although AI tools were celebrated for enhancing the efficiency of assessment and providing comprehensive feedback, the study described some of the teachers' trepidation regarding bias and dehumanisation in the assessment of students (Haleem et al., 2022; Lopez et al., 2021).

Immersive and interactive learning environments

Learners today have access to methods that enable them to experience learning in ways that develop their conceptual understanding (Hughes et al., 2019). Goh (2020) stated that numerous opportunities exist due to various factors in technology, particularly following the development of virtual reality (VR) and augmented reality (AR) capabilities (Haleem et al., 2022; Lopez et al., 2021). For example, science teachers can take their VR devices and create virtual representations of experiments it just conducted (Ravshanovna, 2025). VR can also afford opportunities for students to explore biological systems using 3D models (Aad, 2025). It can represent either of the two. Patel (2021) and Martinez (2023) argue that it had no current opportunity to offer either method in traditional classrooms (Alam & Hasan, 2025; Smith, 2021; Abaricia, 2023). These tools not only provide meaningful learning opportunities (Garcia, 2022; Ding et al., 2024) but also support students in their learning by leveraging their personal experiences (Winter et al., 2021).

Mobile and blended learning designs

Mobile and blended learning have emerged as new options for learning due to advancements in technology (Ding et al., 2024; Babo et al., 2021). Mobile learning allows for greater flexibility in

the classroom (Harris, 2023). Advances in technology allow some teachers to deliver some distance courses, (Ding et al., 2024; Babo et al., 2021) now available to students around the world (Aad, 2025), as long as there is a mobile app or Learning Management System (LMS) available for a teacher to use (Abaricia, 2023). These hybrid classrooms incorporate formal learning activities, including lectures, readings, and exams (Taylor, 2022; Hughes et al., 2019). The technology has provided flexibility and independence (Garcia, 2022; Ding et al., 2024) in learning, both within and outside the regulated classroom environment (O'Connor, 2023). In part, this is due to the tremendous flexibility (Haleem et al., 2022; Lopez et al., 2021), which increases access to education and enables personalized learning terms (Evans, 2022). This is another advantage of flexibility (O'Connor, 2023). The summary of the thematic findings is presented here.

Table 1
Summary of the Thematic Findings

Author and Year	Theme	Findings
Abaricia, 2023	Digital tools and instructional strategies	LMS, whiteboards, flipped classrooms improve engagement and differentiation.
Foster, 2020	Digital tools and instructional strategies	Flipped classrooms reduce fading and support collaboration.
Ding et al., 2024	Digital tools and instructional strategies	Teachers prefer experience over AI; training gaps exist.
Babo et al., 2021	Digital tools and instructional strategies	Flipped and blended learning increase flexibility and engagement.
Haleem et al., 2022	Digital tools and instructional strategies	Interactive whiteboards boost engagement; AI adoption faces barriers.
Lopez et al., 2021	Digital tools and instructional strategies	AI aids personalization but raises bias concerns.
Roberts, 2020	Digital tools and instructional strategies	Whiteboards enhance visual and kinaesthetic learning.
Harris, 2023	Digital tools and instructional strategies	Technology supports differentiation and timely responses.
Hasan et al., 2025	Digital tools and instructional strategies	Teacher digital literacy affects tech integration success.
Ravshanovna, 2025	Professional development and teacher readiness	The pandemic revealed gaps in teacher digital literacy.
Winter et al., 2021	Professional development and teacher readiness	Systemic training deficiencies identified.
Islam et al., 2024	Professional development and teacher readiness	AI impacts practice and academic integrity.
Lopez et al., 2021	AI and automation in teaching processes	AI supports personalized learning, but concerns about bias remain.

Author and Year	Theme	Findings
Hughes et al., 2019	Immersive and interactive learning environments	VR/AR creates experiential learning opportunities.
Alam & Hasan, 2025	Immersive and interactive learning environments	Limited immersive experiences in traditional classrooms.
Garcia, 2022	Mobile and blended learning	Mobile/blended learning enhances flexibility and access.
Ding et al., 2024	Mobile and blended learning	Technology enables distance and flexible learning.

Student learning outcomes in educational settings

The relevant findings are presented under subheadings.

Personalized and adaptive learning outcomes

The learning process students experience with their instructors has changed significantly with the introduction of adaptive learning technology in the classroom (Abaricia, 2023). One of the benefits of this technology is that it allows educators to individualize data for each student's specific needs. Garcia (2022) and Hughes et al. (2019) found that when adaptive learning technologies in their educational platform included some form of artificial intelligence, it could effectively improve students' academic skills and recall skills of previous learning. Harris (2023) presented the process of consistently adjusting lesson plans based on the feedback and recommendations of students (Ding et al., 2024; Babo et al., 2021). However, achieving this goal requires persistent revisions and improvements to the instructional materials, as well as adapting to change in response to the students' evolving cognitive needs. The implementation of customized learning pathways enables the various cognitive needs and learning styles of the students (Taylor, 2022). It may also create a culturally responsive learning environment for all students engaging in the course (O'Connor, 2023).

Immersive learning with virtual and augmented reality

Virtual reality (VR) and augmented reality (AR) are both immersive technologies that offer opportunities for experiential learning (Ravshanovna, 2025). In evaluating collectible VR/AR, Harris (2023) is concerned with the potential of using AR and VR technologies to promote critical thinking and cognitive engagement among learners (Ding et al., 2024; Babo et al., 2021). Patel (2021) stated that virtual reality (VR) "has the potential to provide students with meaningful learning, which not only attracts them but also facilitates the students' learning acquisition." In a similar vein, Martinez (2023) provided a discussion on augmented reality (AR) as a means to promote higher-level thinking skills, as well as collaborative learning (Ravshanovna, 2025). Hasan et al. (2024) explore the hybrid supervision practice in their article for this thesis in Crossings: A Journal of English Studies. The article reflects on lessons from the transition to online supervision due to the pandemic as well as the ongoing ramifications that shape the academic landscape (Smith, 2021; Abaricia, 2023). The authors argue that hybrid supervision, which combines face-to-face and online mentoring, provides graduate students with a more supportive and flexible experience (Ding et al., 2024).

Flexibility and accessibility through mobile and blended learning

Mobile and blended learning models, when used together, can lead to more flexible and student-focused learning experiences (Hasan et al., 2024; Abaricia, 2023). Harris (2023) and Thompson (2019) published reviews of the literature on mobile learning, finding that it provides

benefits in terms of flexibility and access for higher education students. O'Connor (2023) also drew similar conclusions based on her incidental observations, which found that mixed-mode learning increased contact between instructors and students, as well as student satisfaction (Thompson, 2019). Increasing positivity associated with self-directed learning, associated with the online world, revealing that the flexibility and resources available via online platforms have a major impact on students, noting the need for some guided help, and included the ever challenges associated with motivation and self-regulated distance-learning challenges, etc (Ding et al., 2024; Babo et al., 2021).

Enhanced critical thinking and problem-solving skills

Virtual reality (VR) and augmented reality (AR) are examples of immersive technologies that can promote deeper cognitive functions (Hughes et al., 2019). These technologies are often used in conjunction (Abaricia, 2023). VR is an important part of both technologies. By using VR, students will engage in simulations and gain authentic experiences that allow them to practice higher-order thinking skills such as analyzing, evaluating, and creating (Patel, 2021; Harris, 2023). The students do learn the higher-order thinking skills mentioned above (Patel, 2021). In addition, VR and AR support the idea of students thinking critically and working collaboratively, which builds on the benefits of experiential learning (Haleem et al., 2022; Lopez et al., 2021). Martinez (2023) added that students would have the opportunity to be part of collaborative groups (O'Connor, 2023). Silfani et al. (2025) explore the strategies that teachers use to develop learners' higher-order thinking skills. Their paper, published in the European Journal of Language Studies and Communication Science, aims to describe practical strategies used in the classroom to enhance essential skills of analysis, evaluation, and creation in their learners. This also argues for a shift away from rote learning, allowing students to think deeply about course content.

Development of digital literacy and self-directed learning

Online learning has provided students with increased experience in managing their learning schedules, utilizing online resources effectively, and navigating technology in their learning experiences, due to the shift to digital learning environments (Taylor, 2022; Hughes et al., 2019). This change occurred due to the transformation described by Hughes et al. (2019). As a result of this work, there is more freedom to learn. Evans (2022) and Taylor (2022) involve considerable skill development, as they adapt to success in both academic and professional contexts, where numerous possibilities exist (Ding et al., 2024; Babo et al., 2021). Both Evans (2022) and Taylor (2022) suggest that developing the skill to take advantage of opportunities opportunistically is important. Different individual situations will influence this possibility (Foster, 2020; Deelay, 2018; Patel, 2021). There is an element of possibility in everything. One agreed-upon outcome of modern education is learning to study independently; this has been identified as a key learning accomplishment. The summary of the thematic findings is presented here.

Table 2

Summary of the Thematic Findings

Author and Year	Theme	Key Findings
Abaricia, 2023	Adaptive learning	Personalizes learning; needs ongoing updates.
Garcia, 2022	Adaptive tech	AI improves skills and recall.
Harris, 2023	Feedback-driven lessons	Continuous adjustments enhance learning.

Author and Year	Theme	Key Findings
Babo, 2021	Customized pathways	Support diverse cognitive and cultural needs.
Patel, 2021	VR/AR for critical thinking	Promotes analysis, evaluation, collaboration.
Martinez, 2023	VR/AR for higher-level skills	Fosters thinking and teamwork.
Thompson, 2019	Mobile learning	Offers flexibility and reach.
O'Connor, 2023	Blended approach	Boosts contact and motivation.
Hughes, 2019	Critical thinking with VR/AR	Enhances higher-order skills and experiential learning.
Silfani, 2025	Teaching strategies	Supports analysis, evaluation, creation skills.
Taylor, 2022	Digital literacy and self-learning	Builds independence and management skills.

DISCUSSION

The findings of this thematic review suggest that educational technology holds transformative potential for improving the teaching and learning experience. As Abaricia (2023) points out, digital tools can revolutionize classrooms by facilitating personalized, efficient, and engaging learning environments. However, while the literature primarily supports the integration of technology into educational practices, it also reveals critical limitations related to teacher preparedness, curricular alignment, and equitable access (Haleem et al., 2022; Lopez et al., 2021). A central theme emerging from the literature is the significant impact of personalized learning. With the support of artificial intelligence (AI) and adaptive learning systems, educational content can now be tailored to meet the individual needs of students, leading to increased engagement and retention (Khan et al., 2024; Islam et al., 2024; Poth, 2018; Hughes et al., 2019). This customization is suited for various learning contexts in which students have different backgrounds, learning styles, and readiness levels. In support of the concept that flipped classrooms and interactive whiteboards are not only tools for personalized learning, but also free up time for teachers to spend with students and enhance learning even further (Foster, 2020; Roberts, 2020).

However, teacher readiness acts as a significant barrier. While Ding et al. (2024) note that teachers often express an unwillingness to engage with AI-based strategies, it is not an argument against AI's effectiveness; instead, teachers base their pedagogies on their conventional experiences. This reflects a more significant challenge: without sufficient training and development, teachers will not effectively utilize even the most advanced technology. Akintayo et al. (2024) explain that teacher identity and digital competence must be aligned in meaningful and sustainable ways. Even more importantly, it is clear from the literature that professional development for teachers should extend beyond technical expertise and help teachers re-conceptualize their pedagogical beliefs. Another significant finding was the immersion provided in augmented and virtual reality, which engages students in experiential learning opportunities that traditional mediums cannot. Embodied learning facilitated through technology (Babo et al., 2021; Martinez, 2023) can de-situate conventional instructional experiences, offering students the opportunity to engage deeply with the content. The same can be said about the gamified environment, providing students with interactive learning scenarios to help develop motivation and skills (Lajane et al., 2020). The innovations discussed demonstrate how educational technology can enhance content delivery by engaging students' sensory and emotional domains.

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Nevertheless, these developments highlight a contradiction present in the existing literature regarding technology. Expressions of technology's effectiveness abound in the literature; however, access is not equitable. Taylor (2022) and Bahati et al. (2019) demonstrate that many students are unable to take advantage of digital learning opportunities due to socioeconomic constraints. Conditions which Balaji and Roy (2017) and Hughes et al. (2019) frame as a socio-ecological factor contributing to a "digital divide" for learners, which can be compounded by poor infrastructure or institutional support. Eliminating the dangers presented by a digital divide to allow equitable access requires policy direction (Hughes et al., 2019). Unless equitable access is achieved, the full educational potential of technology cannot be fully realized. Another significant gap in the literature exists concerning how digital tools have been, or are going to be, integrated into institutional practices. Many technologies are effective, but Bahati et al. (2019) and Guerrero-Roldán (2019) argue that these technologies and innovations are not integrated into sustainable approaches to curricular systems. When sustainable practices fail to uphold the original promise of digital innovations, it implies that they are ineffective in supporting student learning and learning opportunities. However, a problem with recognizing the fundamental reality is that integrating educational technology into institutions requires schools and universities to rethink and reimagine how their curricula are designed. When new technologies are integrated, it does not mean that schools and universities are simply inserting new tools into already existing structures. Incorporating new technologies means rethinking how learning is conceptualized and how it is delivered.

Another significant and sometimes overlooked theme is digital literacy. Digital literacy has been identified as both an outcome and as a prerequisite for using educational technologies, and is defined as the ability to evaluate, create, and use digital content (Hague & Payton, 2010). Without these skills, students and teachers are unable to utilize educational technologies effectively in their learning and teaching. For learning or teaching to occur, educational institutions need to develop the necessary knowledge that enables participants to engage with these learning opportunities, simply by providing devices or software. As Mahmood et al. (2020) explain, automated feedback and intelligent tutoring systems are only helpful when learners can understand how to identify and act on the feedback made available to them. This research has implications for educators, policymakers, and researchers. Firstly, educators need to be both provided with and develop ongoing content sensitivity, which is much broader than training on technology. Educators should feel supported in adopting pedagogies they believe are suitable and encouraged to develop professional judgments on how specific digital tools can facilitate learning (Hasan & Rahman, 2017). Policymakers need to review what equity means in the context of digital learning. Moving forward with efforts, inequity needs to be addressed, particularly among low-income learners. This could be achieved through investment in infrastructure and subsidies for connections (Taylor, 2022; Hughes et al., 2019), as a means to address the significant digital divide.

Finally, educational institutions must also rethink their curricular frameworks to integrate technology more effectively. This means moving away from a one-size-fits-all curriculum or approach and adopting a more open mind when developing curricula that promote new and emerging technologies, catering to the diverse learner. While there is a significant potential for educational technology to change the landscape of traditional learning environments, the actual integration of these technologies, and likely new technologies to come in the future, will be contingent upon multiple chaining and interlocked variables: teacher training, access to technology, curriculum, and digital skills (Hasan & Ibrahim, 2017). Literature suggests the potential of technology to transform teaching and learning; however, it also cautions against adopting technology and educational technology superficially or cheaply. Suppose it will have a positive impact on the educational landscape. In that case, various stakeholders in education will need to collaborate, work together, and build upon each other to create a new system of educational values that utilizes technology, is creative, innovative, and open to the future.

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CONCLUSION

Educational technology has been presented in this thematic review as a valuable tool for enhancing teaching effectiveness and improving learning outcomes for students in various ways. Several digital technologies, such as learning management system platforms (LMS), artificial intelligence feedback systems, and flipped classrooms, are examples of technologies that teachers have utilized to improve instructional delivery. Other technologies, like adaptive learning systems and immersive learning environments, have enabled students to maximize their learning and performance. Together, new educational technologies have contributed to improved levels of engagement, motivation, and academic achievement, as referenced in studies on many of these technologies. The technologies have facilitated personalized instructional options for pupils, reduced teachers' administrative burden, and provided opportunities for immediate feedback to students regarding instruction, thereby addressing the first research question.

Technology itself is contingent upon a teacher's willingness and ability to use it, and the teacher's access to professional development opportunities and digital resources can serve as a contextual linking factor. The second research question examines the impacts of educational technology on student learning outcomes. The consensus is that personalized learning pathways and immersive learning experiences are areas of educational technology that have contributed equally to enhanced levels of engagement, knowledge retention, and academic achievement. By providing a flexible and accessible way of learning, mobile and blended learning models support student success.

However, there are still challenges. The digital divide continues to limit access for some students; in general, many teachers lack training on how to use technology. Additionally, if technology is not embedded purposefully within curricula, its impact remains limited. These results warrant urgent policy attention, additional investment in teacher training, and further longitudinal research on the effects of technology on cognition. Future research might focus on the longitudinal effects of technology on learning outcomes and contexts across populations. There is also an urgent need to devise frameworks for evaluating the ethical and practical implications of AI and immersive technologies in classrooms. Closing these gaps will help to facilitate the impact of technology for more equality and efficacy in education globally.

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