

DIGITAL TECHNOLOGY'S EFFECT ON TEACHING AND LEARNING

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ABSTRACT

Digital technology has had a big impact on how teaching and learning are done in different areas of education. It has been demonstrated that incorporating educational technology into teaching and learning procedures improves their efficacy (Qurat-ul-Ain et al., 2019). According to Qurat-ul-Ain et al. (2019), it is essential for raising productivity, efficacy, and pedagogical advancements that are beneficial to education. Interactive learning experiences are made possible by educational technology, which offers new ideas and uses beyond simple digital resource storage and transfer (Tuma et al., 2021). Furthermore, by providing a variety of learning opportunities and encouraging co-creative thinking abilities, digital technologies have been shown to support collaborative creativity in language instruction (Sastre et al., 2022). Even while technology offers many advantages, there are still issues with how to integrate it into the classroom. According to several studies, it's critical that teacher educators act as role models and encourage educators to use technology (Matthew et al., 2002). Furthermore, emphasis has been placed on the role that educational leaders play in helping students acquire digital citizenship and technology use (Baydar, 2022). In order to maintain teaching and learning as the primary focus in the face of technological improvements, schools must establish technology leadership. (In Davies, 2010). Moreover, the integration of technology in education has been linked to favorable consequences, including expedited and effortless learning and the promotion of inclusive, sustainable education (Uygun et al., 2020). Divergent viewpoints exist about the efficaciousness of technology in education. While some contend that technology can augment learning, others maintain that specific domains of knowledge, such as physical education, cannot be satisfactorily imparted through technological means (Aprilo et al., 2023). All things considered, incorporating technology into education necessitates a thorough comprehension of both its possible advantages and disadvantages, highlighting the necessity of ongoing professional development and assistance for teachers (Karakas & Hidiroglu, 2022).

Keywords: Digital Technology, Learning, Teaching, Professional Development, Digital Literacy.

1.0 INTRODUCTION

At all educational levels, the way that teaching and learning are conducted has been significantly impacted by digital technology. Studies have indicated that the implementation of digital instructional technologies enhances student performance at all educational levels, from basic to university. (Kaldirim & Tavşanlı, 2021). Comparing digital learning to traditional teaching techniques, it has been discovered to improve learning motivation and outcomes, highlighting the significance of motivation in enhancing learning effectiveness (Lin et al., 2017). Furthermore, digital technologies are seen as essential instruments in the field of

education, completing the set of conventional teaching strategies and improving the quality of instruction as a whole (Patrício & Moreno, 2021).

Research has indicated that incorporating digital technologies into teaching techniques and facilitating interactive learning might enhance student engagement and improve academic results (الشدناوى & أبو وط بل, 2021). There are obstacles, too, since some educators are not equipped to use digital tools in the classroom (Chrismastianto & Wibawanta, 2023). In the digital age, instructors' collaborative efforts using digital technology have been shown to benefit both educators and students (Castaño-Muñoz et al., 2021).

Digital games are used to teach mathematics to elementary school pupils, demonstrating the favorable effects of digital technology on teaching quality, learning processes, and student engagement in a variety of scenarios (Khairova & Gabdullina, 2020). Academics highlight how important digital learning is to improving educational results and developing teaching technologies (Hsu, 2020). Additionally, it has been established that using interactive digital game-based instructional technology can improve student engagement and learning experiences (Huong & Cuong, 2021). All things considered, the incorporation of digital technologies into the teaching and learning process has the power to revolutionize the field of education by enhancing learning outcomes, motivation, and student involvement. Still, it is critical to address issues with educators' digital literacy and make sure that educators have the abilities needed to use digital tools in the classroom (Hidayat, 2019).

2.0 USING DIGITAL TECHNOLOGY AS AN INFORMATION-ACCESSING TOOL

Digital technology is being used more and more to access information in a variety of disciplines, including research, education, and everyday life. Digital technologies make it easy and quick to access a large amount of information, allowing users to effectively search for, retrieve, and analyze data. Undergraduate students need to be proficient in digital literacy since it affects both their academic and personal lives (Huong & Cuong, 2021). Evaluating students' digital abilities is essential to creating instructional strategies that work. In order to enhance learning experiences, emphasize how critical it is to assess digital game-based instructional technology.

According, Jones and Czerniewicz (2010) draw attention to the different viewpoints of second- and third-year students, highlighting the dynamic nature of digital literacy abilities and the need for interventions that are customized to the academic levels of the students. These results can be used by educational institutions and instructors to develop focused interventions that address the unique digital literacy requirements of undergraduate students. Establishing a supportive learning environment that fosters understanding of the dynamic nature of digital technology and students' viewpoints at different academic stages is essential.

In the study by Wang and Baker (2018), the focus is on understanding the factors that drive students to complete Massive Open Online Courses (MOOCs). The research delves into whether students are motivated by the content of the courses or the platform itself. This study provides insights into the motivations behind student engagement in online learning environments. Selwyn (2016) examines the difficulties associated with integrating technology in educational settings while examining the topic of whether technology is good for education. A thorough analysis of the possible advantages and disadvantages of technology in education helps to clarify the complex nature of this problem.

Furthermore, digital literacy studies have made significant progress and offer promising prospects for the future, as highlighted by Warschauer in 2010. One avenue that has been explored in enhancing digital literacy is through digital game-based instructional technology. Huong & Cuong (2021) discuss the feasibility and effectiveness of utilizing digital games for instructional purposes. They emphasize that digital games can positively influence users' comprehension of real-world scenarios and provide immediate feedback, facilitating a deeper engagement with the content embedded within the games.

3.0 MODERN TECHNOLOGY MAKES TEACHERS MORE PROFESSIONAL IN LEARNING

Experience around the world in developing, industrialized, and information-based countries has shown that teacher training in the use and application of technology is the key determining factor for improved student performance (in terms of both knowledge acquisition and skills development enabled by technology). Educational technology is not, and never will be, transformative on its own—it requires teachers who can integrate technology into the curriculum and use it to improve student learning. In other words, computers cannot replace teachers—teachers are the key to whether technology is used appropriately and effectively. The importance of continual learning opportunities for teachers to stay up to date on pedagogical approaches, research, and educational trends is emphasized by Darling-Hammond and Richardson (2009). They contend that collaborative learning, introspection, and exposure to novel concepts are all ongoing components of good teacher learning rather than a one-time occurrence. The writers emphasize the necessity of individualized professional development that is customized to meet the needs of specific teachers and concentrates on useful tactics that may be used in the classroom.

Furthermore, the integration of technology in education has been a focal point for researchers and educators alike. Puentedura's SAMR model (Substitution, Augmentation, Modification, and Redefinition) has been widely used to analyze the process of educational technology integration (Drugova et al., 2021). This model provides a framework for understanding how technology can be utilized at different levels to enhance learning experiences. By applying models like TPACK (Technological Pedagogical Content Knowledge) and SAMR, educators can effectively incorporate digital tools into teaching practices (Mabuan, 2018). The SAMR model offers a structured way to evaluate the impact of technology on teaching and learning, guiding educators to move beyond simply substituting digital tools for traditional ones towards redefining the learning experience (Weiger, 2020).

For this transition to be successful, a mix of leadership, vision, technique, and cultural shift is needed (Quendler, 2019). Furthermore, Volkov and Chikarova (2021) assert that using of information and communication technology is a pivotal factor in molding the professional identities of educators and pupils.

Digital technology can support the growth of 21st century skills and digital literacy

Digital technology considerably facilitates the development of 21st-century skills and digital literacy. People today need to be proficient in navigating and using digital tools since technology plays a fundamental role in many parts of our lives. Digital technology enhances teamwork and communication, which helps develop 21st-century skills. Platforms such as messaging apps, video conferencing, and collaboration tools allow people to work together and

communicate over distances. This fosters the development of skills like teamwork, communication, and adaptation—all very important in today's interconnected world. These ideas are contested by Kirschner and De Bruyckere (2017), who offer data that refutes the presumptions of the multitasker and digital native theories. They contend that being a child of the digital age does not. They stress that trying to multitask causes people to become less productive and make more mistakes since the human brain is not built to manage several things at once.

Furthermore, Voogt and Roblin (2012) did a study in which they compared worldwide frameworks pertaining to 21st-century competencies and talked about how these frameworks affected national curriculum policies. The study examined many current frameworks that delineate the competencies considered necessary for individuals to prosper in the twenty-first century. In order to better prepare students for the challenges of the modern world, the study sought to shed light on how these international frameworks might influence national curricular policies. In addition, the Fraillon et al. (2014) ICILS international report clarifies the differences in CIL proficiency between pupils from various socioeconomic backgrounds. The study emphasizes how important it is to eliminate digital disparities in order to guarantee that everyone has fair access to technology and CIL education. Examining the correlation between students' socioeconomic position and CIL skills, the paper provides valuable perspectives on the obstacles and possibilities associated with advancing digital inclusion in education. In order to sum up, digital technology is an effective instrument for promoting the development of digital literacy and 21st-century skills. People can improve their critical thinking, creativity, problem-solving, communication, and teamwork skills by using digital tools and resources. To prosper in the twenty-first century, people must embrace digital skills and adjust to the changing digital landscape as technology advances.

4.0 THE CAPACITY TO ACCESS A VAST AMOUNT OF KNOWLEDGE USING DIGITAL TECHNOLOGY

New innovations and improved organization have been made possible by information. Our ability to arrange ourselves properly to provide the best results increases with the amount of knowledge we have. For this reason, gathering data is an essential part of any company. This data can also be used to forecast future events and present trends of particular parameters. As we become aware of this, we have introduced technological advancements in this area and have proceeded to produce and collect more data about nearly everything. We currently live in a world where a mountain of data is available to us regarding various aspects of our lives, including social interactions, science, employment, health, and others. The research conducted by Hargittai (2010) dispels the myth that youths have the same aptitude for and understanding of digital media. The study highlights the need to avoid generalizing about a whole generation and instead take into account individual variations in Internet abilities and usage patterns. The author recognizes that young people have varying levels of digital competency, which emphasizes the necessity for specialized interventions and educational initiatives to effectively close the digital divide. Moreover, Jenkins et al. (2006) underscore the need for media education to equip individuals with the skills and literacies necessary to engage meaningfully in participatory culture. They advocate for a shift from traditional media literacy focused on consumption to a more comprehensive approach that encompasses production, distribution, and collaboration. This expanded view of media education is essential for empowering individuals to critically analyze media messages, create their own content, and participate in

online communities. In addition, Livingstone and Helsper's (2007) study underscores the importance of considering not only access to digital devices but also the quality of that access, including the availability of high-speed internet, digital literacy skills, and the ability to leverage digital tools for educational and social purposes. By recognizing the multifaceted nature of digital inclusion, the authors provide a more comprehensive understanding of how disparities in digital access and usage manifest among children and young people. Warschauer explores the idea of the digital divide and its consequences for social inclusion in his influential essay "Technology and Social Inclusion: Rethinking the Digital Divide," which was published in 2003. The difference between people who have access to and are proficient with information and communication technologies (ICTs) and those who do not is known as the "digital divide." Numerous factors, including age, geography, education level, and socioeconomic class, might have an impact on this disparity. All things considered, Warschauer's research clarifies the complexity of the digital divide and the significance of reconsidering conventional methods for closing it. Policymakers and other interested parties can create more successful plans for fostering social inclusion and guaranteeing that everyone in society can take use of the benefits presented by technology by taking into account the larger social and economic framework in which the digital divestment operates.

5.0 CONCLUSION

Teaching and learning have been greatly impacted by digital technology in a number of ways. The use of digital resources in the classroom has affected teachers' methods of instruction as well as students' academic achievement in both positive and bad ways. Digital technology can improve student motivation, engagement, and teamwork during the learning process, according to research studies. For instance, options for personalized learning experiences customized to the interests and preferences of each individual student are made possible via interactive educational software and internet platforms. E-learning also includes learner-learner interactions, such as those that may occur in the online learning society (Al-Hariri and Al-Hattami, 2017). Furthermore, digital technology has also made educational materials and information more widely accessible, removing geographical constraints and allowing students to learn from anywhere, at any time. Students who live in rural areas or have limited access to traditional educational institutions have benefited most from this. Furthermore, digital tools like simulations and virtual reality have completely changed experiential learning by enabling students to participate in practical exercises and realistic settings that improve their comprehension of difficult subjects. Additionally, the use of digital twins can optimize the remote teaching process and provide a high-quality learning experience for students (Wang, 2021) On the other side, worries regarding digital technology's potential disadvantages have been voiced due to its overuse in education. In excess of screens and passive information consumption through digital devices have been connected to shorter attention spans, a decline in critical thinking abilities, and a rise in distractions during class. Furthermore, the gap in technological access between kids and those without it has expanded educational gaps, making it more difficult for teachers to provide all students with fair learning opportunities. Technology-assisted language learning in the digital age has opened up opportunities for various learning styles and modes of communication (Melkonyan & Matevosyan, 2020)

In summary, there are a number of benefits and drawbacks to digital technology's influence on teaching and learning. To improve student learning outcomes, educators must find a balance between utilizing the advantages of digital tools and addressing the drawbacks of using them.

Teachers can take advantage of digital technology's potential to improve teaching and learning processes by carefully and consciously incorporating it into their practices. However, challenges exist, such as the digital divide affecting access to technology (Fataar & Norodien-Fataar, 2021)

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