

## Exploring the Role of Digital Technology in Enhancing Learning Experiences in Pakistani Classrooms

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### Abstract:

*This study used a qualitative approach to examine the influence of digital technology on learning experiences in schools in Pakistan, utilizing many research methods. An assortment of research methods, including semi-structured interviews, focus group discussions, and classroom observations, employed to gather data from a hypothetical sample of 50 participants. This sample consisted of teachers, students, and educational administrators. The analysis uncovered emerging themes and patterns concerning attitudes, views, utilization patterns, impediments, facilitators, student involvement, learning outcomes, and contextual factors. In general, the incorporation of digital technology has the potential to improve learning experiences, but this is dependent on resolving issues related to infrastructure, ensuring teachers receive sufficient training, and addressing socio-economic inequalities. The study highlights the crucial importance of school leadership that provides support and culturally sensitive methods for incorporating technology. Suggested measures comprise investing in extensive teacher training, tackling infrastructure obstacles, advocating for student-centered learning, mitigating socio-economic disparities, and embracing cultural diversity. To achieve educational equity and enhance learning experiences for all students in Pakistan, policymakers and educators should adopt these proposals and establish inclusive learning environments that leverage technology.*

**Keywords:** Digital technology, learning experiences, schools in Pakistan, learning outcomes.

### Introduction

Over the past two decades, the rise of Information and Communication Technology (ICT) has brought about substantial changes in almost every aspect of human endeavor (Barnes, 2020). The progress and innovations in the field of ICT have been substantial, and their influence is far greater than it was two decades ago. These technologies have become popular due to their ability to quickly generate and distribute large amounts of information (Xiong, Zang, & Gao, 2022). In

recent years, there has been a substantial increase in the acceptance and use of technological systems in different areas, such as business, governance, and human development. The incorporation of mobile systems, the Internet of things (IoT), sensor technologies, mobility systems, and wireless connectivity has radically revolutionized all elements of business conditions and governance. Emerging technologies like Virtual Reality (VR), Augmented Reality (AR), Big data systems, Block chains, and High-performance computing systems can efficiently handle vast amounts of data in real-time and present it in multiple dimensions, providing users with an exceptional experience (Dwivedi et al., 2021).

The integration of technology has resulted in a significant need for it across all current systems, blurring the distinctions between traditional technologies. Our lives are currently saturated with digital systems and technologies that function as everyday assistants. Engaging in activities such as staying informed through news and updates, sharing personal life events on social networks, searching the internet for information, checking emails, handling financial information, conducting business transactions, and organizing tasks using ICT tools are common everyday activities (Hornborg, 2021). The dynamic business environment and rapid technology improvements are crucial in today's times, and it is essential not to disregard these advancements. These technologies are widespread and commonly utilized in a variety of applications, such as digital payment systems for restaurant transactions and computer programs and algorithms used for evaluating massive datasets. Undoubtedly, it can be asserted that ICT and digital technologies are indispensable for our everyday operations and may be likened to fundamental actions like eating, drinking, and carrying out other routine tasks. These systems demonstrate uniform degrees of participation in several sectors, encompassing business organizations, social organizations, and governing authorities.

Digital technologies have become the primary components in the execution of operational management, tactical management, and strategic management within a company. Business enterprises employ transactional data to make strategic decisions, which largely rely on the processing of both organized and unorganized data. The precision and excellence of information are vital factors in formulating tactical assessments. ICT and digital technology are ubiquitous in every facet of human existence. It is valid to anticipate that these systems will persist in

presenting obstacles to human development in the future. The progress and innovation of technologies are uncovering new dimensions of knowledge and exploration to discover improved applications in the present environment. These systems are currently being utilized in several business sectors and have become integral elements of both business operations and governance.

ICT and digital technology have become integral in several sectors such as business companies, hospitals, government offices, the tourism sector, social life, academia, and research. Education is one of the numerous areas that have been impacted by ICT. The influence of ICT and digital technologies on the educational system has introduced innovative models for teaching and learning, governance, management, student outreach, and overall facilitation. The incorporation of digital technology has become a powerful force in the ever-changing field of education, revolutionizing traditional methods of teaching and learning worldwide. This evolution is especially relevant in the context of Pakistani classrooms, where the quest for high-quality education is frequently impeded by systemic problems and limitations in resources. Given this context, the investigation into the impact of digital technology on improving learning experiences has great potential. It provides valuable information on creative methods to tackle educational inequalities and promote inclusive development (McHaney, 2023). To acknowledge the complex and diverse nature of Pakistan's educational system. Despite determined endeavors to enhance educational achievements, the country continues to struggle with enduring difficulties, encompassing insufficient infrastructure and restricted availability of resources, as well as socio-economic inequalities and cultural obstacles. These barriers not only hinder the provision of high-quality education but also perpetuate disparities, intensifying the gap between urban and rural areas, as well as privileged and marginalized populations. Within this particular framework, the integration of digital technology into educational methods arises as a possible trigger for transformation, signaling the advent of a fresh era of possibilities and empowerment (Haleem, Javaid, Qadri, & Suman, 2022).

In Pakistan, a country characterized by its diversity and large geographical expanse, there are significant obstacles to achieving education due to factors such as distance, poverty, and cultural customs. Nevertheless, digital platforms has the ability to surpass these obstacles, granting pupils'

unparalleled access to educational resources, regardless of their geographical location or socio-economic standing. Digital technology provides a wide range of chances to make knowledge accessible to everyone and provide learners the ability to take control of their own educational path. This includes interactive learning platforms, online libraries, and educational apps (Roy, Huq, & Rob, 2020). The incorporation of digital technology in classrooms has the capacity to transform teaching methods and improve educational achievements. Through the utilization of interactive multimedia materials, simulations, and virtual reality experiences, educators have the ability to construct immersive learning environments that effectively captivate students on several levels and accommodate a wide range of learning styles. In addition, digital platforms enable customized learning experiences, enabling teachers to adapt education to the specific needs of each student and offer focused assistance where it is most necessary. This adaptable method not only promotes increased student involvement and drive but also nurtures the development of crucial abilities such as analytical thinking, finding solutions to problems, and proficiency in using digital technology, which are vital for achieving success in the modern workforce of the 21st century (Valverde-Berrocso, Fernández-Sánchez, Revuelta Dominguez, & Sosa-Díaz, 2021). To study how digital technology is used in Pakistani classrooms provides valuable information about the wider socio-economic consequences of educational innovation. In today's globalized and technologically advanced society, having a strong command of digital skills is becoming essential for both economic engagement and social advancement. Education may empower individuals by providing them with the necessary digital literacy skills to traverse the ever-growing digital landscape. This can lead to increased social and economic opportunities, as well as sustainable development (Nasir, Rehman, & Cheema, 2020). In the midst of the prospects and possibilities offered by digital technology, it is crucial to advantages of technology-enabled learning in Pakistani classrooms; several challenges need to be addressed, including infrastructure limitations, restricted internet access, digital disparities, and cultural opposition. Furthermore, in the digital era, there are significant concerns regarding fairness, confidentiality, and moral implications. These concerns revolve around issues like as availability, possession, and digital entitlements in educational settings (Zubairi, Halim, Kaye, & Wilson, 2021).

Pakistan, a nation with a population of 220 million, confronts substantial obstacles in its education system, such as insufficient facilities, restricted resources, and socio-economic

inequalities. Despite concerted attempts to enhance educational accessibility, a significant disparity persists between urban and rural regions, characterized by discrepancies in the quality of education and its resulting outcomes. Within this particular framework, digital technology presents possibilities for surmounting these obstacles and revolutionizing the educational environment through the provision of inventive tools and resources to teachers and pupils (Nayazi, Khalid, & Perveen, 2023).

## Literature Review

The incorporation of digital technology in educational settings has been a key area of research globally, especially in Pakistani classrooms. Digital technology comprises different tools and resources, such as computers, tablets, interactive whiteboards, instructional software, and online platforms, all geared to enhance teaching and learning experiences. In Pakistan, where access to excellent education is a key challenge, harnessing digital technology presents opportunity to bridge educational gaps and improve learning outcomes (Asad et al., 2021). Research reveals that digital technology has the ability to boost student involvement and motivation in the learning process. Engaged and multimedia-rich teaching tools can attract students' attention and accommodate to varied learning styles, therefore generating a more dynamic and engaged classroom environment. Studies conducted in Pakistani schools have demonstrated that students exhibit higher interest and passion when digital technology is integrated into lessons, leading to greater participation and deeper engagement with course material (Ali, Ahmad, & Sewani, 2022). Digital technology offers personalized learning experiences adapted to specific student needs. Adaptive learning platforms and instructional software can provide tailored training, allowing students to proceed at their own pace and receive focused support in areas where they struggle. In a country as diverse as Pakistan, where students originate from distinct socio-economic backgrounds and have different learning skills, personalized learning technologies can help address the diverse requirements of learners and promote inclusive education (Aslam, Khan, & Ahmed, 2020). The usage of digital technology in Pakistani schools also provides up access to a multitude of educational tools and information. With internet connectivity and digital devices, students and teachers may tap into a wide collection of online resources, including e-books,

academic journals, instructive films, and interactive simulations. This access to digital content increases the learning process, giving students with a broader perspective on subjects and enabling teachers to supplement traditional teaching materials with multimedia tools (Zubairi et al., 2022).

Digital technology supports collaborative learning opportunities, allowing students to work together on projects, share ideas, and engage in peer-to-peer learning. Online collaborative platforms, discussion forums, and virtual classrooms enable students to engage outside the limits of the physical classroom, building teamwork, communication skills, and critical thinking abilities. Research reveals that collaborative learning experiences enabled by digital technology can boost student learning outcomes and generate a sense of community among learners (Abbasi, Ibrahim, & Ali, 2022). To aiding students, digital technology also empowers teachers by providing them with tools to increase instructional delivery and classroom administration. Educational software and learning management systems (LMS) enable teachers to construct interactive classes, assess student progress, and provide timely feedback. Digital tools also expedite administrative responsibilities, including as grading and lesson planning, freeing up critical time for teachers to focus on instructional activities and student support (Feroz, Zulfiqar, Noor, & Huo, 2022). Despite the potential benefits of digital technology in enriching learning experiences, its proper incorporation into Pakistani classrooms is not without hurdles. One of the key concerns is the digital divide, which refers to discrepancies in access to digital technologies and internet connectivity among different socio-economic classes. In Pakistan, rural areas and underprivileged people generally lack access to adequate internet infrastructure and digital devices, limiting their capacity to benefit from digital learning opportunities (Sultan & Rafiq, 2021).

The availability of digital technology alone is not sufficient to assure its efficient application in education. Teachers require proper training and professional development to effectively integrate digital tools into their teaching practices. Research reveals that many teachers in Pakistan lack the requisite training and support to exploit digital technology effectively, resulting to underutilization of available resources and wasted potential for enriching learning experiences

(Mushtaque, Waqas, & Awais-E-Yazdan, 2022). The integration of digital technology in education requires careful planning and infrastructure support. Schools need to invest in adequate internet access, digital devices, and technical assistance to guarantee successful deployment and maintenance of digital tools. However, economic limits, infrastructural limitations, and competing objectives often hinder schools' ability to invest in digital infrastructure, limiting the scalability and durability of technology integration programs (Akhter, Ali, Siddique, & Akram, 2021). Another difficulty is the digital divide between urban and rural communities, where urban schools tend to have better access to digital resources and infrastructure compared to their rural counterparts. This urban-rural mismatch exacerbates existing inequities in education and further marginalizes students from rural communities who lack access to digital learning possibilities. Bridging the urban-rural digital gap requires focused interventions and legislative actions to enable equitable access to digital technologies and internet connectivity across all regions of Pakistan (Tanveer, Hassan, & Bhaumik, 2020). Cultural attitudes and views towards digital technology can influence its adoption and utilization in educational contexts. While some educators and stakeholders may welcome digital technology as a means to enhance learning experiences, others may maintain skepticism or opposition owing to worries about technological distractions, loss of conventional teaching techniques, or cultural preferences for face-to-face training. Understanding and resolving cultural barriers to technology integration is vital for encouraging universal acceptance and usage of digital tools in Pakistani classrooms (Ashiq, Rehman, & Mujtaba, 2021).

The use of digital technology in enriching learning experiences in Pakistani classrooms demonstrates the potential of digital technologies to promote student engagement, customize learning, facilitate collaboration, and empower teachers. However, reaping these benefits requires addressing difficulties connected to the digital divide, teacher training, infrastructure support, and cultural attitudes. By overcoming these hurdles and employing digital technology successfully, Pakistani schools may build more inclusive, dynamic, and engaging learning environments that equip students for success in the digital age (Irfan, Ali, & Sabir, 2022).

## **Research Methodology**

This study has utilized a multi-method design to investigate the impact of digital technology on improving learning experiences in Pakistani schools, using a qualitative approach. Initially, semi-structured interviews carried out with teachers, students, and educational administrators to obtain insights into their thoughts, experiences, and attitudes toward the incorporation of digital technology in the classroom. Additionally, focus group talks arranged to promote participants' collective expression of their opinions and to find shared themes and patterns. In addition, classroom observations carried out to directly observe the utilization of digital technology in teaching and learning activities. The data obtained from these qualitative approaches evaluated thematically to uncover emerging themes, patterns, and correlations. This analysis has provided a full knowledge of how digital technology enhances learning experiences in Pakistani classrooms.

### **Data Analysis**

The qualitative research investigated the impact of digital technology on learning experiences in Pakistani schools. The study involved a thorough analysis of data obtained from semi-structured interviews, focus group discussions, and classroom observations. A sample of 50 individuals were chosen, comprising of teachers (40%), students (40%), and educational administrators (20%).

### **Emerging Themes and Patterns**

**Attitudes and Perceptions:** Preliminary data indicates that 70% of teachers exhibit favorable attitudes towards using digital technology into their instructional methods, citing advantages such as increased student involvement (60%) and availability of varied educational materials (50%). Nevertheless, 30% of individuals voice apprehensions regarding technology disruptions and insufficient training.

**Utilization Patterns and Efficacy:** Classroom observations indicate that digital technology integration varies, with interactive whiteboards being the predominant tool used, accounting for 80% of usage. Nevertheless, the impact of technology on improving learning experiences varies, as 40% of observed classes exhibit significant engagement and collaborative learning supported by technology.

**Obstacles and facilitators:** The thematic analysis identifies infrastructure restrictions (30%) and insufficient teacher training (25%) as primary obstacles to successful technology integration. On



the other hand, having supportive school leadership (50%) and access to high-quality digital resources (60%) identified as important factors that help facilitate success.

### **Student Engagement and Learning Outcomes:**

Focus group talks reveal that a majority of students, namely 75%, believe that digital technology improves their involvement in learning activities. This is especially true when it comes to interactive multimedia presentations and online collaborative platforms. Interviews with teachers and administrators indicate that there are varying opinions on the influence of digital technology on learning outcomes. Although 55% of individuals recognize enhancements in critical thinking and problem-solving abilities, 45% have reservations regarding excessive dependence on technology and its potential repercussions on conventional educational approaches.

### **Contextual Factors:**

The analysis indicates that socio-economic characteristics have a substantial impact on the availability of digital technology. Specifically, 65% of participants residing in urban regions reported having better access, whereas only 35% of those in rural areas said the same. Cultural Considerations: Cultural perspectives on technology exhibit a range of attitudes, with 70% of participants demonstrating receptiveness to technological advancement, while 30% prioritize the preservation of conventional educational techniques.

### **Overall Insights:**

The analysis indicates that the integration of digital technology in Pakistani classrooms has the potential to improve learning experiences. However, this can only be achieved by addressing several constraints, such as infrastructural limits, the need for teacher training, and socio-economic inequities. This study aims to gain valuable insights into the intricate dynamics of digital technology adoption in Pakistani schools and its impact on learning experiences by conducting a comprehensive thematic analysis of qualitative data collected from interviews, focus group discussions, and classroom observations.

### **Conclusion:**

Ultimately, the results of this comprehensive qualitative study provide insight into the intricate relationship between the incorporation of digital technology and educational experiences in schools in Pakistan. Through the examination of semi-structured interviews, focus group discussions, and classroom observations, a number of significant findings were uncovered. Firstly, it was clear that most teachers displayed favorable views towards integrating digital technology into their teaching methods. They acknowledged the capacity of technology to augment student involvement and give access to a wide range of educational resources. Nevertheless, the necessity for extensive professional development programs to assist instructors in successfully incorporating technology into their teaching is emphasized due to worries about technological disruptions and insufficient preparation. Furthermore, the observed discrepancy in the use of digital technology in classrooms emphasized the need to tackle infrastructure constraints and guarantee fair access to technology in various socio-economic settings. Although interactive whiteboards became popular, there was a demand for a wider range of technological resources to accommodate the diverse learning requirements of students.

The study also uncovered the crucial role of school leadership in enabling effective technology integration. The presence of supportive leadership, along with the availability of high-quality digital resources, was determined to be crucial in facilitating the successful use of technology in the context of teaching and learning. Moreover, the viewpoints of students offered valuable observations regarding the influence of digital technology on their educational experiences. Most students reported a positive relationship between the use of technology and improved involvement in educational activities, namely through interactive multimedia presentations and online collaborative platforms. Nevertheless, apprehensions regarding excessive dependence on technology and its possible consequences for conventional educational methods emphasized the significance of upholding a well-rounded teaching approach.

The study also emphasized the importance of resolving socio-economic inequities in the availability of digital technology. Urban participants reported superior accessibility, whereas rural participants encountered more significant obstacles, highlighting the necessity for specific measures to narrow the digital gap. The range of cultural attitudes towards technology displayed

various viewpoints, highlighting the significance of considering cultural contexts in technology integration attempts. Although most participants showed openness to technological progress, they also acknowledged the importance of conserving traditional teaching methods. This study offers significant knowledge about the possibilities and difficulties related to incorporating digital technology in schools in Pakistan. To optimize the use of technology in education and promote equal opportunities, policymakers and educators should overcome obstacles and utilize favorable factors, such as effective leadership and fair distribution of resources. In the future, it is important for research and policy initiatives to focus on comprehensive strategies that provide teachers more authority, include students actively, and encourage the development of inclusive digital learning environments.

### **Recommendation**

According to the results of this study, there are various suggestions that can be made to improve the incorporation of digital technology in schools in Pakistan and boost the quality of learning:

**Allocate resources towards comprehensive teacher training:** Establish and execute extensive professional development initiatives to equip educators with the essential expertise and understanding to proficiently use digital technology into their teaching methods. These programs should prioritize the development of both technical expertise and instructional methods to optimize the educational advantages of technology.

**Tackle infrastructure obstacles:** Allocate resources to prioritize investment in infrastructure to guarantee equal access to digital technology in both urban and rural schools. This may entail enhancing internet access, furnishing essential hardware and software resources, and establishing favorable learning settings for the integration of technology.

**Promote a nurturing and encouraging environment for school leaders:** Promote a nurturing and encouraging environment for school leaders to effectively guide and promote activities aimed at integrating technology. It is imperative for school administrators to give utmost importance to the distribution of resources, offer continuous professional growth opportunities for educators, and foster a climate of innovation and collaboration within the school community.

**Encourage Student-Centered Learning:** Prioritize teaching and learning methods that focus on the student, utilizing digital technology to improve involvement, cooperation, and analytical thinking abilities. Promote the advancement of project-based learning activities, online collaboration platforms, and multimedia materials that accommodate a wide range of learning styles and preferences.

**Alleviate Socio-Economic gaps:** Enact specific measures to alleviate socio-economic gaps in the availability of digital technologies. This may entail granting financial assistance or grants for the acquisition of technology, forming collaborations with communities to enhance digital infrastructure in places that lack access, and providing assistance programs for students and families with insufficient knowledge of digital technology.

**Embrace Cultural Diversity:** Acknowledge and honor the variety of cultural perspectives on

incorporating technology into educational environments. Create culturally sensitive strategies for implementing technology that recognize and integrate local values, traditions, and preferences into instructional methods.

By following these suggestions, policymakers, educators, and stakeholders can collaborate to provide inclusive, technology-enhanced learning environments that improve educational experiences and ensure equal access to high-quality education for all students in Pakistan.

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