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Perspectives on the Evolution and Future of E-Learning at University Level in Pakistan: A Qualitative Study

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ABSTRACT

This study provides a comprehensive understanding of the evolution and future trajectory of e-learning at the university level in Pakistan, offering valuable insights into future directions. The study adopted an interpretive philosophical approach to understand the evolution and future trajectory of e-learning in Pakistan. The researcher employed a random sampling technique to focus on the lived experiences of faculty and E-learning professionals worldwide. Moreover, the researcher used a qualitative research design by utilizing semi-structured interviews as the primary method of data collection. A total of 55 participants were approached from both public and private universities offering e-education and E-Learning professionals, but only 35 responded. For the analysis of data, the researcher employed thematic analysis, which revealed key themes and patterns, providing a comprehensive understanding of university-level e-learning. The study highlights the rapid evolution of E-Learning and its future path in higher education institutions in Pakistan. Furthermore, the study recommended that future researchers develop a model for integrating immersive technologies (AI, AR, VR, and blockchain) in higher education institutions to promote e-learning in Pakistan.

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INTRODUCTION

The study investigates the evolution and future of e-learning in Pakistan by examining the experiences of e-learning professionals. E-learning's evolution is characterized by its adaptability in meeting the unique needs of each learner. Artificial intelligence (AI) and machine learning (ML) algorithms enhance learning by analyzing learner behaviour, while immersive technologies like virtual reality (VR), augmented reality (AR), and mixed reality (MR) redefine experiential learning by simulating real-world scenarios (Dritsas & Trigka, 2025). Mahmadov (2025) highlighted the evolution of the learning process, with digital learning becoming a cornerstone of modern education, utilizing online courses, e-learning platforms, and mobile applications. According to Bozkurt and Sharma (2020), the 21st-century pandemic has accelerated the adoption of digital learning, despite challenges such as limited access to technology and inadequate teacher training, to enhance learning experiences and foster inclusive environments. In another similar study by Ali (2020), the rapid shift to online and blended learning in higher education, driven by the 21st-century pandemic, was highlighted, posing both potential and structural challenges. Chikwaka et al. (2024) and Abbas et al. (2019) emphasized the importance of 21st-century teachers possessing digital literacy, creativity, innovation, and knowledge, as well as subject content knowledge and technological proficiency. A study by Ahmad and Mohebi (2024) found that e-learning is effective for underprivileged populations due to access to technology, a lack of enthusiasm, and perceived indebtedness, emphasizing the need for fair access. A study on technology adoption in Pakistan by Jabeen et al. (2022) found that universities face challenges in implementing e-learning due to technological issues, including inadequate infrastructure and concerns about data security. This study also found that students' lack of understanding is a significant factor in failure.

The Rationale of the Study

According to Naseer et al. (2025), researchers in Pakistan are exploring the use of E-Learning, AI, and VR in higher education, despite limited implementation compared to developed countries, highlighting their potential in teaching and learning.

The rationale for this study is that the Pakistani education system has traditionally focused on didactic teaching, which does not cater to different learning rates and understanding levels. E-learning offers a unique solution that focuses on student performance, learning capabilities, and progress (Saputra et al., 2023). E-learning enhances accessibility to higher education, addressing the scarcity of university facilities. To prepare students for the Fourth

Industrial Revolution, educational institutions need to integrate innovative teaching techniques as well as new digital technologies. The research examines the future of E-Learning in Pakistan, guiding higher education institutions on how to utilize digital technologies effectively.

Objectives of the study

The study aims to investigate the evolution and future of e-learning in Pakistan by examining the experiences and perspectives of academic leaders and E-Learning professionals. The two-fold objectives of this study are:

1. To examine the current development of e-learning at the university level in light of modern global trends.
2. To explore the future of e-learning for the Z-Generation in Pakistan.

Research Questions

1. How is e-learning currently developing at the university level in Pakistan in light of modern global trends?
   - What is the status of e-learning infrastructure and digital resources within Pakistani universities?
2. What is the future of e-learning for the next generation in Pakistan?
   - What emerging e-learning technologies are most promising for Pakistani universities?

Significance of the Research

This study holds significant importance, as it directly addresses the urgent need for digital transformation within Pakistan's higher education system. As technology continues to shape global society, Pakistani educational institutions must rapidly adapt to remain competitive on the international stage. This research offers critical insights for stakeholders, clarifying the effectiveness of personalized learning AI, virtual reality classrooms, and various e-learning platforms. Consequently, its findings will be instrumental in guiding future policy decisions, curriculum reforms, and the strategic integration of Information and Communication Technologies (ICTs) to meet the evolving demands of Pakistan's education sector, thereby aligning with international standards.

LITERATURE REVIEW

E-learning

E-Learning is the use of technologies to create learning experiences. The primary aim of a distance education program is to facilitate learning for learners who are otherwise unable to attend traditional classroom settings (Miller et al., 2013). Learning is the process of gaining information. It is done either in person or online. Teaching has historically taken place in a classroom, a convention that has been followed for decades. E-learning, or electronic learning, is the use of technology and the internet to teach outside of the traditional classroom setting. According to a study by Baba et al. (2021), E-learning can be categorized into Asynchronous and Synchronous methods. Asynchronous methods involve recorded videos, lectures, and educational games without a direct instructor, while Synchronous methods involve direct participation between learners and teachers. Both methods are utilized by institutions such as Allama Iqbal Open University in Islamabad and the Virtual University of Pakistan, which provide digital learning resources, online call services, SMS, podcasting, and Moodle. Asia e University Malaysia also operates on a similar pattern for large-scale learning.

In conclusion, E-Learning enables remote learning and teaching, promoting knowledge retention, teamwork, and critical thinking. It revolutionizes the education sector by providing virtual classrooms and interactive materials. E-learning has become the new norm, allowing students to learn at their own pace and in their way, thereby enhancing efficiency and effectiveness.

Evolution of online learning

According to Ahsan (2022), Pakistan's education sector has undergone significant transformations, particularly in online learning, with the 21st-century pandemic accelerating these changes. Students now prefer online teaching during unfavorable conditions or when they are away from campus.

According to Gallagher & Palmer (2020), online education in the U.S. has evolved through the following phases, illustrated in Figure 1:

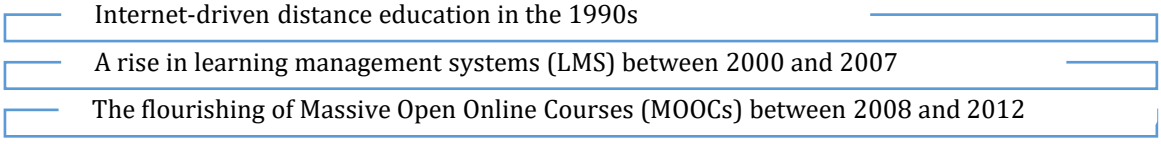

Figure 1: Phases of Online Education

MOOC platforms, such as Udemy, are aggregating courses from different universities into a single platform, offering new business-to-business channels through direct partnerships with employers. Through these platforms, various universities provide specific courses for learners, especially for U.S. students, to earn transferable certificates. According to a study by García-Peñalvo (2021), Quality online courses require competent teams of specialists, designers, technologists, academics, and subject matter experts. Additionally, Change leaders need to redefine, align, and integrate online education services for sustainable offerings.

In brief, online education is evolving in response to the changing needs of learners. The focus is shifting from content delivery to community building, with an emphasis on dynamic, interactive experiences in real time. This evolution is making education more personalized, inclusive, and vibrant.

Future of E-Learning in Education

E-learning is a growing trend in education, including online courses, webinars, and digital resources. Mishra et al. (2020) highlighted the influence of e-learning on education and its various forms, such that the realm of education is increasingly shaped by e-learning. This growing trend includes online courses, webinars, and multiple digital resources.

Globally, e-learning offers benefits such as flexibility, accessibility, and personalized learning, driving increased adoption in higher education institutions (Means et al., 2010). According to Bozkurt & Sharma (2020), the 2019 pandemic catalyzed this shift, making remote learning indispensable. E-learning is transforming the way we teach and learn in an ever-evolving educational landscape. The future of e-learning in education is predicted to be influenced by several major trends mentioned below.

Blended learning, as explained by Platonova et al. (2022), also known as hybrid or mixed-mode education, is an instructional approach that integrates various learning methodologies in a classroom setting. It focuses on enhancing data analysis and computational skills, combining face-to-face and online experiences, and promoting collaborative activities that utilize both online and offline resources. Moreover, Murtaza et al. (2022) presented a comprehensive description of personalized learning, stating that for effective learning, personalization is vital, taking into account individual demands, requirements, objectives, and skill levels. Video-based learning, another interactive online education method, offers benefits such as the ability to pause and rewind, easier information absorption, and collaboration, allowing students to watch lectures, tutorials, and demonstrations tailored to their specific needs (Yoon et al., 2021).

Additionally, the transformative role of Augmented Reality (AR) and Virtual Reality (VR) in e-learning has been highlighted, enhancing immersive experiences and creating risk-free simulations (Jang et al., 2021). As virtual and augmented reality technologies transform the educational landscape, the global education market is projected to reach over USD 1.3 billion by 2026. This technological shift also brings substantial economic benefits, with VR training demonstrating a 52% greater cost-effectiveness. Moreover, the concepts of micro learning and Nano learning are increasingly being adopted. Micro learning aims to teach a single objective per session by segmenting key material and presenting it through various engaging forms, including quizzes, videos, and gamification features (Leong et al., 2021). Meanwhile, Nano learning, a shorter lesson format of just 3-5 minutes, is proving invaluable for time-constrained students. It effectively caters to their demand for quick and timely task completion, highlighting the importance of embracing this educational trend (Huang et al., 2020). Queiro-Ameijeiras et al. (2025) suggested that gamification is an effective way to enhance student engagement and motivation in online learning environments significantly. A critical aspect they highlight is ensuring gamified elements reinforce learning objectives and do not divert attention from the core material, a preference shared by 95% of learners who favor gamified work experiences. Lastly, artificial Intelligence (AI) is transforming e-learning by offering personalized experiences, real-time feedback, and automated administrative duties. Utilizing machine learning and algorithms, AI analyzes user interactions to identify individual strengths and weaknesses while tracking progress. These AI-powered solutions increase learning with customized content and immediate feedback. They also pinpoint patterns in student data, delivering automated feedback to help students' better grasp their performance needs (Lechhab et al., 2024).

Status of E-Learning in Pakistan

There are certain benefits of E-Learning, like increased accessibility, flexibility, and cost-effectiveness. This is why e-learning in Pakistan is gaining significant attention on a large scale in both academic and professional training. The Higher Education Commission (HEC) of Pakistan has been instrumental in promoting e-learning through various initiatives, including the development of online learning platforms and the facilitation of access to digital resources. Universities like Virtual University of Pakistan have been pioneers in offering online degree programs, and

the incorporation of e-learning components into their existing curricula by other universities is a promising sign for the future of education in Pakistan.

According to UNESCO, at least 1.6 billion learners were affected by COVID-19-related disruptions at some point, prompting them to use online learning systems more frequently. Several Universities in Pakistan, including COMSATS University, Allama Iqbal Open University (AIOU), and Virtual University, have attempted to implement the new method of learning (Akram et al., 2021).

METHODOLOGY

The study employed a qualitative approach to investigate the current developments in E-Learning and the future of E-Learning in higher education in Pakistan. Qualitative research examines individuals' experiences and behaviors within their contextual circumstances, including social, economic, cultural, or physical contexts, which shape their lives (Mojarad et al., 2023).

The study analyzed existing literature, case studies, and research findings to evaluate the future of E-Learning in higher education institutions and offer guidance for future direction.

Participants and Sampling

Fifty-five participants were randomly approached from both public and private universities offering e-education across Pakistan, as well as E-Learning professionals worldwide. However, only 35 participants responded. The group included 18 faculty members, eight administrators, and nine E-Learning professionals representing various academic disciplines and regions to ensure diversity.

Data Collection

Data for this study were collected through a combination of semi-structured interviews conducted in person, by telephone, via Gmail, and using Google Forms.

Data Analysis

To analyze e-learning and its potential to improve equity and quality through its evolution and future perspective, thematic analysis was employed. Furthermore, this qualitative research method is frequently chosen for its ability to generate strong and accurate findings through systematic and thorough analysis, a point emphasized by Nowell et al. (2017). The findings provide an overview of the current state of E-Learning and its future implications.

RESULTS

The analytical process began with an in-depth evaluation, followed by the organization and refinement of the datasheets. This critical step served to focus the essential information, allowing for the emergence of themes and sub-themes. Categories were specifically designed from the raw codes, ensuring direct relevance to the research questions, which collectively formed the basis for two primary themes: (i) Comprehensive Digital Education; (ii) Pakistan's Journey with Reimagined E-Learning.

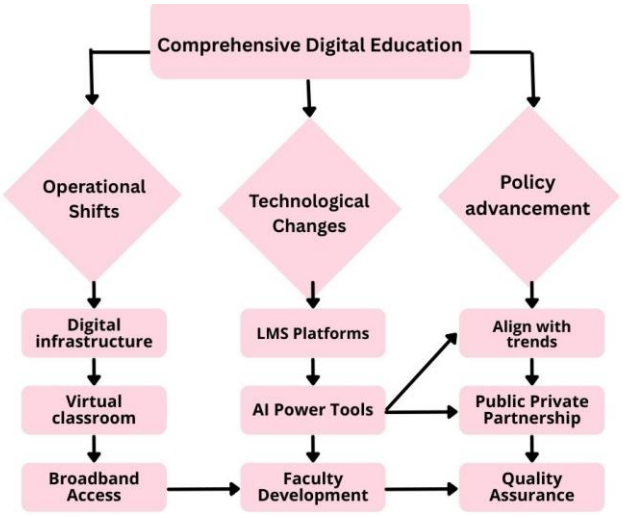

Figure 2: Thematic Mapping of Theme Comprehensive Digital Education

Theme 1: Comprehensive Digital Education

The qualitative analysis of 25 responses reveals the current state and potential improvements for e-learning in Pakistan's higher education, to align with global trends. This central theme is broken down into three sub-themes: Operational Shifts, Technological Changes, and Policy Advancements, as shown in Figure 2's thematic map.

Operational Shifts

The respondents of the study highlighted that Pakistan's higher education system urgently needs major operational shifts in its e-learning infrastructure and digital resources. This is determining for truly aligning with global standards in digital education. Although institutions like the Virtual University and Allama Iqbal Open University have advanced distance learning, a widespread and equitable digital foundation across the country is still largely lacking. Making significant changes to how higher education works in Pakistan requires a focus on two key areas: having robust internet and digital tools, as well as effective school systems and support. First, we absolutely must completely rebuild our digital setup. This means getting better, faster, and more reliable internet everywhere, especially in remote villages and areas that lack access. It is also vital to address ongoing issues such as unstable electricity and power outages, so that digital learning can occur without interruption. Additionally, schools need to invest in modern computer labs, well-equipped e-learning centers, and establish smart and virtual classrooms. These steps will create the necessary physical and online spaces to ensure that learning is fair and accessible to everyone.

R.17, R.21, R.22 described operational shifts are needed, such as: Strong Digital Infrastructure Prioritize expanding reliable and affordable internet connectivity, especially in rural and underserved regions.

Technological Changes

Respondents' views indicate that Pakistan's higher education system presents a mixed picture regarding its e-learning technology and digital resources, despite its aspirations for a comprehensive digital education. For e-learning in Pakistan to truly advance, we need to update our technology completely. This means getting user-friendly, modern online learning systems that are strong and interactive. We also need to move towards internet-based (cloud) platforms and make sure schools have up-to-date computer equipment. Adding innovative tools powered by AI, mobile learning apps, and virtual labs will make learning more engaging and accessible. Using games (gamified elements) and virtual reality can also make learning much more engaging. Beyond that, everyone needs access to standard digital tools, such as Zoom and Google Classroom, along with various types of learning materials, including interactive videos. Utilizing free, open-source software and ensuring devices work seamlessly together, along with having ample cloud storage, will help this digital shift succeed. However, none of these technological changes will be effective without strong training for teachers and staff. There is a clear need for continuous and ongoing development to help educators learn about educational technology.

R.9, R.17, R.23 describe that encourage and support the development of diverse multimedia learning materials, including interactive videos, simulations, virtual labs, gamified elements, and augmented/virtual reality (AR/VR) experiences where feasible.

Policy Advancement

Participants in this qualitative study, as highlighted by a thematic analysis of the data, emphasized that a crucial aspect of Pakistan's current e-learning scene in higher education, under the broader concept of "Comprehensive digital education," is its Policy-Led Framework. For Pakistan to establish a lasting and innovative e-learning system in higher education, effective policy development is crucial. This means focusing on Quality Assurance & Standards, strong Support & Incentives, and ensuring Inclusivity & Data Management. To ensure that digital education is of high quality and trustworthy, we need solid quality standards. This includes continuously checking quality, setting clear national e-learning standards, and ensuring our standards align with global best practices, particularly for online programs. The goal is for online learning to be as good as, or even better than, traditional education, with regular checks and policy reviews. At the same time, policies must actively encourage and support digital learning by increasing innovation. This calls for clear rules and comprehensive policies that promote online education, as well as a national e-learning plan that incorporates global best practices, thereby enhancing Pakistan's digital education and increasing its recognition.

R.1, R.2, R.3, R.9, R.11, R.16, R.23 describe quality assurance frameworks for online and blended learning programs, ensuring that the quality of e-learning matches or exceeds that of traditional in-person education. This includes accreditation standards specifically for online programs.

Theme 2: Pakistan's Journey with Reimagined E-Learning

Participants' perceptions regarding the transformative impact of emerging technologies on Pakistan's e-learning environment are highlighted in this section, directly contributing to the formation of the sub-themes: (i) Personalized

Digital Learning; (ii) Secure & Inclusive Digital Engagement; (iii) Innovative E-Learning Pathways; (iv) Key Enablers for Effective implementation. This theme addresses the RQ, "What emerging e-learning technologies are most promising for Pakistani universities?" The thematic mapping of this analysis is presented in Figure 3 below.

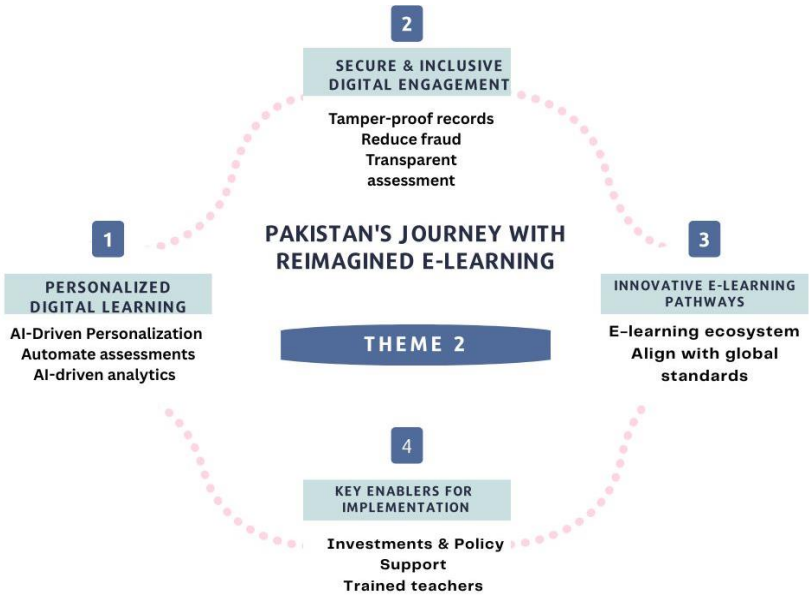

Figure 3: Thematic Mapping of Theme Pakistan's Journey with Reimagined Learning

Personalized Digital Learning

Thematic analysis suggests a future where emerging technologies, such as AI and VR, will profoundly reshape e-learning in Pakistan. It has been consistently found that AI offers unparalleled potential for personalized instruction, analyzing student data to craft adaptive learning paths, providing targeted support where needed, and accelerating progress for students who excel. Likewise, VR stands out for its ability to foster deeply engaging and practical learning experiences, creating virtual classrooms and simulations that make even the most complex subjects, from science to medicine, readily comprehensible. These innovations present immense promise for addressing current educational gaps and fostering new avenues for learning; their effective integration demands strategic foresight, considerable investment, and a focus on both technological and pedagogical evolution.

R.4, R.7, R.17, R.20, R.22, and R.25 describe how AI can personalize learning by understanding each student's needs and providing intelligent tutors and instant feedback. VR can create virtual classrooms and realistic simulations, making learning more engaging and practical, especially for subjects such as science, medicine, and technology.

Secure & Inclusive Digital Engagement

Making digital learning secure and accessible to everyone is a crucial aspect of transforming e-learning. This involves two main categories: securing and clarifying credentials, and enhancing access and inclusion. The responses reveal the true significance of trust and security in digital education, highlighting the importance of having secure and transparent ways to demonstrate qualifications. This means using systems that protect universities' records, certificates, and proof of achievement so they cannot be faked. By making assessments transparent and clear, these new technologies can significantly reduce fraud and foster greater trust in educational qualifications. Utilizing decentralized online learning platforms that permanently record information, such as blockchain, is a significant step towards achieving security and transparency. Participants agreed that it is crucial to ensure digital learning is easily accessible and inclusive of everyone. The main goal is to improve access to online education for all students. This directly helps close the gap between cities and rural areas, allowing universities to offer quality learning materials nationwide. The scenario demonstrates that these efforts are centered on supporting inclusion, ensuring every student has a fair chance in the digital learning environment.

R.2, R.10, R.16, R.18, R.22, R.25 presented that blockchain technologies will revolutionize e-learning in Pakistan by enabling personalized instruction, immersive training scenarios, and tamper-proof academic certification, thus increasing online education's quality and credibility.

R.9, R.22, and R.23 expressed that these technologies can also make quality education more accessible across Pakistan, bridging the gaps between urban and rural areas. However, challenges such as limited internet access, high costs, and inadequate teacher training must be addressed to reap the benefits of these advancements fully.

Innovative E-Learning Pathways

This qualitative section presents that central to "Pakistan's Journey with Reimagined E-Learning" are innovative e-learning pathways, which consistently emerge in discussions about future technologies for Pakistani universities. Educators and policymakers view these technologies not just as simple upgrades but as transformative tools set to revolutionize and modernize the entire e-learning system. This thematic analysis underscores the importance of integrating digital resources, as innovative E-Learning Pathways are essential for transforming and modernizing Pakistan's higher education, thereby ensuring it meets future demands. To achieve this transformation, we must primarily redevelop and modernize e-learning, as this will significantly update the broader education and e-learning environment. The goal is to drive Pakistan's e-learning system toward greater innovation and effectiveness, aligning it with global digital education standards. The discussion concludes that these pathways aim to significantly enhance the engagement, flexibility, and reliability of e-learning for all learners. These advancements are also vital for preparing for future demands. Through the integration of innovative e-learning pathways, educational institutions can effectively future-proof students, preparing them for the evolving challenges, diverse demands, and specific needs of tomorrow's workforce. This strategic shift is designed to both overcome existing challenges and set new goals, thereby transforming the e-learning environment for the future.

R.1, R.5, R.9, R.10, R.12, R.16, R.17, R.20, R.21, R.22, R.23 described that together, these technologies can revolutionize e-learning by making it more flexible, engaging, and trustworthy, helping Pakistan’s education system adapt to future demands.

Key Enablers for Effective Implementation

Under the Key Enablers for Effective Implementation sub-theme of Pakistan's 'Reimagined E-Learning' framework, this research delves into respondents’ perceptions to understand the practicalities and rationale behind Pakistani universities' adoption of innovative technologies. It specifically investigates how and why advanced tools such as Artificial Intelligence (AI), Virtual/Augmented Reality (VR/AR), and adaptive learning systems can be effectively integrated into the nation's educational environment. For e-learning to truly work well in Pakistan, several key factors are necessary, based on the feedback received. This includes investing in digital skills, so people learn how to use computers and the internet effectively. There is also a need for improved internet and facilities everywhere, which will help address the problems of high costs and limited internet access. Furthermore, training for teachers holds a prime position; they need to be taught how to utilize new technology in their teaching. This thematic analysis concludes that strong government support is essential, meaning the government must provide robust backing for digital education, combined with strategic planning and sufficient funding to implement significant changes in how technology is utilized for learning and teaching.

R.16, R.20, R.24 described that for successful implementation, Pakistan must invest in digital literacy, infrastructure, and educator training to harness the full potential of these technologies in reshaping the e-learning landscape.

CONCLUSION

To summarize, this qualitative study sheds light on the multifaceted development of e-learning at the university level in Pakistan, highlighting both the advancements and the challenges, like quality of content, instructor training, and infrastructure, that still require attention. The future of E-Learning in higher education in Pakistan is set for substantial transformation through emerging technologies. These emerging technologies, such as Artificial Intelligence (AI), Virtual Reality (VR), and Augmented Reality (AR), are likely to improve education significantly by offering immersive and personalized learning experiences in the future. Therefore, it is recommended that future researchers develop a model for integrating immersive technologies (AI, AR, VR, and blockchain) in higher education institutions to enhance and facilitate e-learning in Pakistan. Such a model would provide a comprehensive roadmap for policymakers and educators, ensuring that Pakistan's higher education system can fully integrate technological advancements to create a more effective, accessible, and engaging learning environment for all students. This proactive approach is essential for bridging existing educational gaps and positioning Pakistan as a leader in digital higher education.

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