Journal of Social Sciences Research & Policy (JSSRP)

Exploring Opportunities and Challenges in E-Learning Adoption in Pakistan: A Quantitative study

Habib Ullah[1], Dr. Muhammad Obaid Aslam[2]
1. PhD Scholar, Department of Education, The University of Faisalabad, Pakistan.
2. Assistant Professor, Department of Education, The University of Faisalabad, Pakistan.

How to Cite This Article: Ullah, H. & Aslam, D. M. O. (2025). Exploring Opportunities and Challenges in E-Learning Adoption in Pakistan: A Quantitative study. *Journal of Social Sciences Research & Policy. 3 (04), 666-676.*
DOI: https://doi.org/10.71327/jssrp.34.666.676

ISSN: 3006-6557 (Online)
ISSN: 3006-6549 (Print)

Vol. 3, **No.** 4 (2025)
Pages: 666-676

Key Words:
E-learning adoption, Digital Transformation, Digital literacy, Infrastructure challenges

Corresponding Author:
Habib Ullah
Email: habibapsok@gmail.com

Abstract: *E-learning has rapidly gained prominence among scholars, learners, and educators globally. This study critically examines the opportunities and challenges of e-learning adoption in the first established Virtual University in Pakistan; despite its potential to democratize education and overcome geographical and socio-economic barriers, Pakistan faces significant obstacles, such as limited internet connectivity, inadequate digital infrastructure, and low digital literacy among learners and educators. Survey questionnaires were conducted with students, teachers, and administrative staff to understand their real-world challenges in implementing e-learning. Key factors include accessibility, familiarity with technology, instructional quality, and institutional support systems. The study uses theoretical frameworks like the Technology Acceptance Model (TAM), constructivist learning theory, and connectivism to understand cognitive, behavioral, and social dynamics. The insights provide evidence-based recommendations for policy, pedagogy, and technology deployment in Pakistan's unique socio-cultural and economic landscape. The study emphasizes the need to adapt international e-learning models to address the challenges in developing countries, advocating for context-sensitive approaches prioritizing inclusivity, infrastructure development, capacity building, and localized content for equitable and sustainable e-learning adoption.*

Introduction

E-learning has recently garnered considerable interest from scholars worldwide ((Holmes and Gardner, 2006)). Online learning has revolutionized education, offering flexible, accessible, and cost-effective options. Pakistan's high entrepreneurial potential is hindered by inadequate internet facilities, infrastructure, and ineffective online policies. To enhance, government and organizations should address these issue on priority. Communication technologies have revolutionized teaching through the fast advancement of electronic learning, enabling virtual and distant learning programs. These technologies integrate innovation and creativity, enhancing the quality of education and training in both individuals and organizations (Maatuk et al., 2022).

Online learning reduces the need for classroom facilitators, offers inexpensive learning, reduces geographical gaps, and provides course content through learning management systems. Tools like Zoom, Microsoft Teams, Google Meet, and Google Classroom are widely used among college students for online conferencing and classroom management (Saikat et al., 2021).

Bottino (2004) highlighted the significant impact of technology on learning, emphasizing the need for e-learning to meet challenges and provide greater access to knowledge. He suggested using various tools to create active, customized learning environments, motivating learners and encouraging continuous learning. The development of technology continues to explore new approaches to enhance learning experiences.

Literature Review

The concept of E-Learning, abbreviated from "electronic learning," is a significant component of contemporary education. As defined by Wijaya (2021), E-Learning confines online study facilitated by internet and intranet technologies. Its core functionality relies on internet connectivity to serve as a medium for content delivery, such as course materials and quizzes, and to enable vital communication tools between educators and learners.

M-learning, a specialized form of e-learning, provides a platform for students to engage with educational resources using their mobile devices. Its increasing favor stems from its extensive availability and broad accessibility across the community, particularly benefiting students and teachers (Kearney et al., 2012). Fundamentally, m-learning underscores mobility, in contrast to e-learning's primary emphasis on functionality (Georgiev, Georgieva, and Smrikarov, 2004).

D-learning is another term closely linked to e-learning, but it has a broader definition that encompasses E-learning and the learning domains associated with it (Georgiev et al., 2004). Although these concepts of E-Learning are closely connected, they shouldn't be used interchangeably because each term has its distinct meaning.

History of E-Learning

The origin of E-learning can be traced back to Sir Isaac Pitman's 1840 introduction of mail-learning courses, which used shorthand techniques and were considered the first distance learning courses (Verduin & Clark, 1991). Over the past 40 years, E-learning has evolved in various sectors, including school, business, higher education, military, and training. In school, it involves software-based and online learning, while in business; it primarily involves internet-based flexible content delivery for specific communities of practice (Campbell, 2004).

In the early 1960s, Don Bitzer at the University of Illinois created a timeshared computer system called Programmed Logic for Automatic Teaching Operations (PLATO) that was concerned with literacy programs. PLATO allowed students and teachers to use graphics terminals and TUTOR, an educational programming language, to communicate and interact with other users by means of electronic notes, which is the fore runner of today’s conferencing systems (Bitzer et al., 1962). Woolley (1994) argued that PLATO’ scommunication features were innovative and were the base of today’s conference and messaging systems. Although Suppes and Bitzer created technology mainly as a tool, their vision allowed them to use it in other directions and today’s e-learning systems such as Blackboard and ANGEL are the successors of PLATO.

However, the emergence of E-learning in education and business, and its marketing has led to concerns about the influence of quality assurance driven models on structure and quality of these programs (McGorry, 2003). Other concerns target the ability to deliver pedagogically structured learning experiences, or to have a clear learning paradigm have also been raised (Gillham, 2002).

In spite of these concerns, over the past several years, online enrolments have been growing substantially fast (Allen and Seaman, 2011).

Adoption of E-learning in developing countries

E-learning adoption and continuance are crucial issues in developing countries, posing significant challenges to educators and policymakers (Bhuasiri, et al., 2012). The integration of Information and Communication Technology (ICT) into traditional learning environments is challenging due to evolving thinking and attitudes, and it is necessary to consider contextual factors in developing countries for successful integration (Andersson & Grönlund, 2009). The success of E-learning systems in developing countries depends on their true perspective, considering user factors and technological aspects. Prioritizing social and cultural issues is determining for the system's success. Issues when systems arise are not designed from learners' perspectives, as they may differ in moderating variables like age, gender, and experience (Nawaz, 2013). The study emphasizes the need to analyze the challenges and obstacles in promoting and sustaining E-learning adoption in developing nations.

E-learning Status in Pakistan

Since 2000, the Pakistani government has prioritized integrating new technologies into the education system to improve learning outcomes. To modernize the educational system, the government established the Virtual University of Pakistan in 2002. This university aims to provide quality education through online and distance learning platforms (Qureshi, et al., 2010). Demographic and contextual factors influence E-learning usage in developing countries like Pakistan, necessitating the creation of customized E-learning for diverse user groups to promote higher education flourishing (Nawaz & Kundi, 2010). Developing countries exhibit distinct cultural, social, contextual, demographic, government, and organizational policies compared to developed nations (Nawaz, 2012). The quality of models in developed and developing countries can be impacted by numerous contextual differences, unless these factors are locally considered (Basar, et al., 2013). The lack of support for software, hardware, and technology in developing countries like Pakistan can hinder the adoption of new technologies, leading to a knowledge and communication gap, and potential delays (Nawaz & Khan, 2012). The successful implementation of E-Learning requires a clear understanding of its social context, as the UK model may not be as successful in Pakistan as in the UK (Khan, et al., 2013).

Basar, et al., (2013) found that local research is critical for understanding users' views and requirements in the local context, as it helps initiate new ICTs. Local opinion is essential for integrating technology into existing social practices and policies. Efficient E-learning implementation in traditional educational systems is essential to boost learning and understand factors influencing students' intention to use e-learning, ultimately enhancing motivation. Therefore, it is required to conduct research to address the gap in the literature by developing a conceptual model to identify critical factors influencing students' intention to participate in E-learning systems and suggesting recommendations to enhance participation for better learning outcomes.

Theoretical Frameworks for E-Learning Adoption

- **Technology Acceptance Model (TAM):** Developed by Davis (1989), TAM theorizes that professed practicality and comfort of use are key to technology adoption. In e-learning, these perceptions determine willingness to engage with online platforms.
- **Constructivism:** Rooted in Piaget and Vygotsky's work, constructivism emphasizes learner-centered active knowledge construction, aligning with e-learning's interactive nature.
- **Connectivism:** Siemens (2005) highlights learning as network-based, involving connections with people, information, and technology—central to e-learning's distributed learning environments.

E-learning adoption in Pakistan is a growing concern due to the increasing popularity of ICT in education and business organizations. A conceptual model based on the Theory of Adoption and Motivation (TAM) is proposed to understand the critical adoption drivers of e-learning in Pakistan. The model considers students as focal users, emphasizing their individual, organizational, social, and system-level characteristics. Factors such as internet experience, enjoyment, self-efficacy, and computer anxiety significantly influence e-learning adoption. Organizational drivers, such as system accessibility and functionality, also influence successful adoption. The model requires empirical validation to ensure its effectiveness in Pakistan's educational landscape (Kanwal & Rehman, 2014). Al-Handhali, Al-Rasbi, & Sherimon (2020) highlighted the benefits of LMS, including user-friendliness, time management, course management, report generation, and environmental impact reduction, thereby reducing costs and time.

Key Findings from Literature

E-learning adoption hinges on technology readiness (infrastructure, devices), human readiness (digital literacy), and institutional readiness (policies, support) (Rodrigues et al., 2019).

Problem Statement

Despite the growing momentum of e-learning adoption in Pakistan, learners are not fully benefiting from its potential due to significant implementation challenges. This study seeks to bridge this knowledge gap by identifying the main obstacles to e-learning adoption and subsequently proposing practical recommendations to optimize its integration across the country, drawing insights from the contexts of Virtual University of Pakistan. The findings are intended to inform policy-makers and educational institutions, contributing to the development of strong and high-quality e-learning frameworks nationwide.

Research Objectives

RO1: To determine the key challenges perceived by both students and faculty in the process of e-learning adoption at Virtual Universities of Pakistan.

RO 2: To suggest practical recommendations to minimize e-learning adoption challenges at Virtual Universities of Pakistan.

Research Questions

RQ 1: What are the perceived main challenges experienced by students and faculty during the adoption of e-learning across Virtual Universities of Pakistan?

RQ 2: What practical recommendations can help minimize the challenges of e-learning adoption at Virtual Universities of Pakistan?

Methodology

This study adopted a quantitative research paradigm to thoroughly investigate the multiple e-learning experiences of academic staff affiliated with Virtual University across Pakistan. The research design was ex-post facto, focusing on existing phenomena without direct manipulation of variables, thereby allowing for the comprehensive collection of perceptions and experiences. A non-probability, purposive sampling method was employed to identify and select participants, ensuring that only academic staff members with direct and vast experience in the design, delivery, or support of e-learning initiatives were included. This targeted approach yielded a sample size of 100 academic staff members, representing various departments and levels of engagement within the virtual university system. Data collection was systematically conducted over a period of two months, primarily through a self-administered, structured survey questionnaire. This instrument, developed specifically for this study operationalized key variables related to e-learning experiences using a 5-point Likert scale, allowing for the collection of responses. The questionnaire was administered efficiently via Google Forms to

maximize reach, and complemented by personal visits to virtual university campuses to facilitate participation and ensure high response rates. Prior to data collection, ethical approval was obtained from relevant committee and all participants provided informed consent, ensuring anonymity and confidentiality of their responses. Subsequent data analysis was performed utilizing the most recent version of the Statistical Package for the Social Sciences (SPSS) software, specifically descriptive statistics (means, standard deviations).

Discussion and Analysis

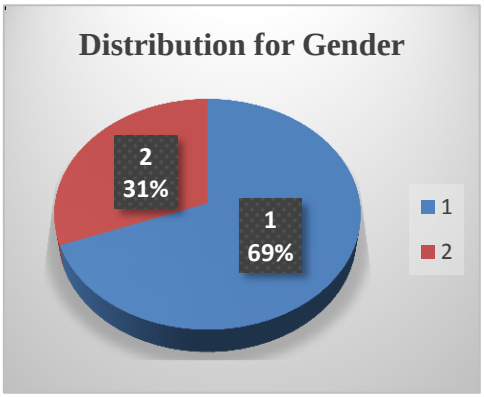
Data Analysis

Gender

The frequency distribution of university members consisted of 9 (69.2%) male and 4 (30.8%) female respondents (*N*=13).

Table 1: Frequency Distribution for Gender

Gender	Frequency	Percent
1 (Male)	9	69.2
2 (Female)	4	30.8

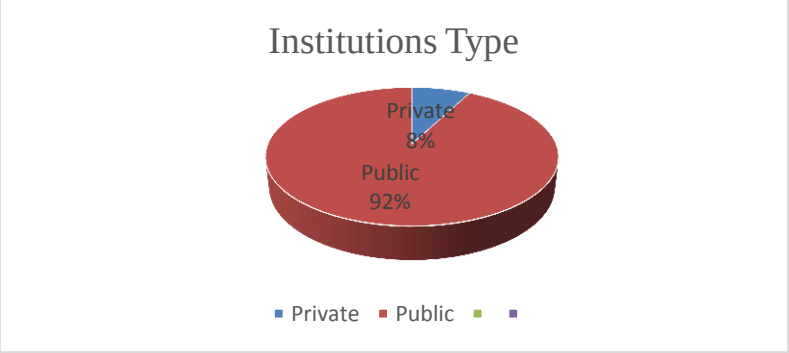


Institution type

The frequency distribution of institution type is consisted of 1 (7.7%) private and 12 (92.3%) public sectors (*N*=13).

Table 2: Frequency Distribution for Institution type

Institution type		Frequency	Percent
	Private	1	7.7
	Public	12	92.3



Reliability

Reliability is the measure of internal consistency of constructs in the study. Cronbach's alpha coefficient is the most reliable and useful model to measure the reliability and internal consistency of constructs. Therefore, we assessed the reliability by using the Cronbach's alpha as shown in Table 3.

Table 3: Cronbach's Alpha Reliability

Construct	No. of Items	Alpha *(α)*
Opportunities	8	.717
Threats	8	.480

In our study sample, the Cronbach alpha value for opportunities is .717, which shows the acceptable reliability of the construct. This implies that this construct consistently measures the perceived opportunities aligned with e-learning. In contrast, the Cronbach's alpha for threat is .480, shows the low internal consistency among items. Therefore, this reliability level indicates the need for further scale development, particularly for the threats dimension, to ensure more accurate and consistent measurement in future studies.

Table 4: Descriptive Statistics for Opportunities

Items	Minimum	Maximum	Mean	Std. Deviation
Opportunity1	1.00	5.00	3.4615	1.45002
Opportunity2	3.00	5.00	4.0769	.75955
Opportunity3	1.00	5.00	4.0000	1.15470
Opportunity4	3.00	5.00	4.0769	.75955
Opportunity5	2.00	5.00	3.2308	.83205
Opportunity6	1.00	5.00	3.4615	1.12660
Opportunity7	2.00	5.00	4.2308	.92681
Opportunity8	1.00	5.00	3.6923	1.31559
Opportunities	2.75	4.88	3.7788	.61904

The descriptive statistics for opportunities reveal an overall mean score of 3.778 (SD=0 .619). This shows the positive perception of opportunities among the university members.

Opportunity 1 highlights that the institution recognizes 'expanding access to underserved populations via e-learning' is an extremely high-impact (5.00) strategic opportunity with high inherent potential. This leads to a high overall opportunity score of 3.4615, signalling its significant value to the institution's mission and growth.

Opportunity 2 puts forward that the institution recognizes 'online teaching' presents a moderately likely (3.00) yet extremely high-impact (5.00) opportunity for integrating international academic collaborations. This results in a very high overall opportunity score of 4.0769, indicating that this is considered a top strategic priority due to its transformative potential. The relatively low standard deviation (0.75955) further highlights a strong consensus among stakeholders regarding the significant value and feasibility of pursuing this avenue, suggesting that there is clear alignment on leveraging online teaching for global engagement.

Opportunity 3 shows the effective scaling of hybrid/blended learning models' as an inherently available (implied by 1.00 likelihood of existence) and extremely high-impact (5.00) opportunity. This leads to a very high overall opportunity score of 4.0000, positioning it as a top strategic priority due to its significant potential to transform educational delivery and institutional efficiency.

Opportunity 4 emphasizes that the institution perceives the introduction of 'cross-university online modules' as a moderately likely (3.00) yet extremely high-impact (5.00) opportunity. This high score of 4.0769, exhibiting a top strategic priority due to its significant potential for academic enrichment.

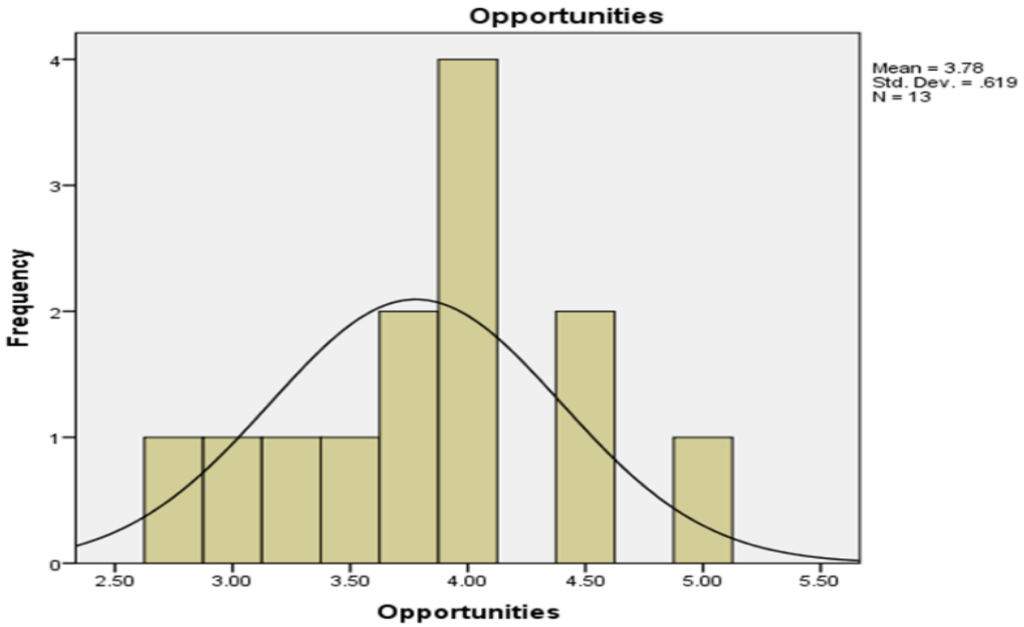
The interpretation of opportunity five strongly suggest that 'grants and funding for digital education initiatives are becoming more accessible' as a moderately likely (2.00) yet extremely high-impact (5.00) opportunity resulting in a moderate overall opportunity score of 3.2308, expressing a valuable avenue to pursue, it might not be as strategically critical or as easily achievable as some other opportunities.

Opportunity 6 shows that global trends in lifelong learning and online professional development' as an inherently available (implied by 1.00 likelihood) and extremely high-impact (5.00) opportunity for e-learning expansion.

However, the opportunity 7 had the highest mean value 4.230 (SD= 0.926), indicating that universities are moving towards grants/funding for digital education initiatives that are becoming more accessible.

Finally, Opportunity 8 describes that expanding the availability of online courses and learning resources represents an inherently available (implied by 1.00 likelihood) and extremely high-impact (5.00) opportunity to enhance student academic workload management and overall experience.

Table 5: Descriptive Statistics for Challenges



Items	Minimum	Maximum	Mean	Std. Deviation
Challenge 1	1.00	5.00	3.0000	1.22474
Challenge 2	2.00	5.00	3.6923	1.10940
Challenge 3	2.00	5.00	3.5385	.96742
Challenge 4	2.00	4.00	3.3077	.63043
Challenge 5	1.00	5.00	3.8462	1.21423
Challenge 6	1.00	5.00	3.1538	1.06819
Challenge 7	1.00	5.00	3.3846	1.12090
Challenge 8	1.00	4.00	3.1538	.89872
Challenges	2.38	4.13	3.3846	.48536

The descriptive statistics for challenges shown in Table 5 reveal an overall mean score of 3.384 (SD=0.485). This shows that the respondents perceive moderate level of challenges and showing low variability among participants with relatively consistent perception.

Challenge 1 had the lowest mean value 3.000(*SD* = 1.224) indicating the neutral perception among respondents. However, the relatively high standard deviation shows the number of opinions, that resistance to change is the critical barrier, while others may perceive that it is not a notable barrier. Therefore, among all other challenges, this threat perceives to be less critical in the growth of E-learning.

Challenge 2 highlights the lack of digital equity among students, specifically regarding access to devices and the internet, is a moderately likely but highly impactful challenge to educational initiatives, particularly e-learning.

Challenge 3 shows that the institution recognizes 'data security and privacy issues' as a moderately likely but extremely severe challenge that critically impacts user trust in its digital platforms. The institution or assessors believe there's a tangible, on-going risk of such issues arising, perhaps due to evolving cyber threats, human error, or system vulnerabilities.

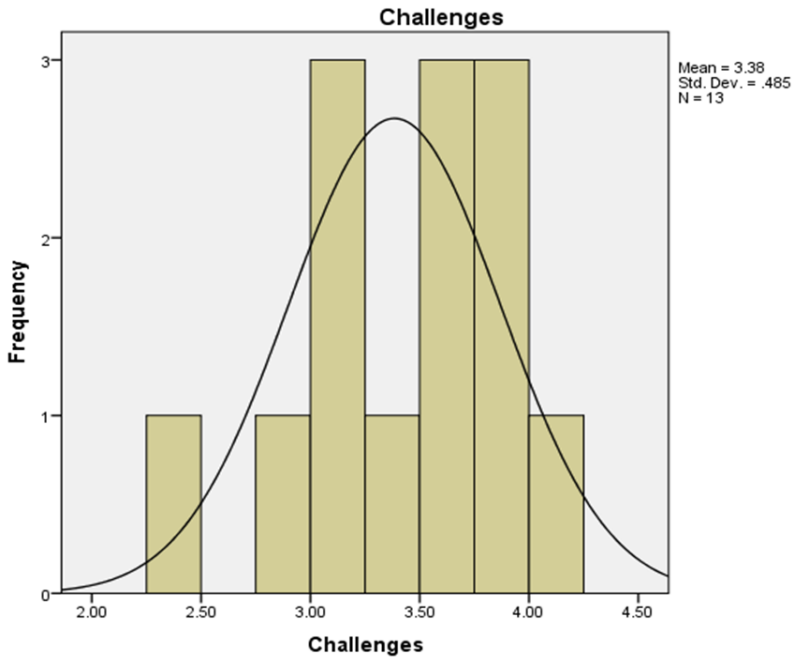
Challenge 4 presents that the institution faces a moderately likely (2.00) but highly impactful (4.00) challenge due to its E-learning policies being still in flux and inconsistent. This situation poses a significant overall risk (3.3077), as it can hinder the efficient and effective growth of E-learning initiatives.

On the other hand, Challenge 5 had the greatest mean value of 3.846(SD= 1.214), indicating that the respondents generally agree about the student engagement evaluation is challenging in virtual learning environment. While the standard deviation shows moderate variability in responses, that most of the participants perceives online learning as a key issue, but some of them have different views depending on the context on tools they used.

Whereas Challenge 6 comes forward that the university perceives 'economic downturns and regulatory changes' as a challenge with a very low current likelihood (1.00) of significantly impacting E-learning enrolment, but with an extremely high potential for havoc impact (5.00) if they *do* materialize. This combination results in a moderate to high overall risk score of 3.1538, indicating that despite their perceived infrequency, these external factors are serious enough to warrant close monitoring and contingency planning.

Challenge 7 explains that the university perceives the rapid pace of technological change as a constantly present challenge carrying an extremely high potential for catastrophic impact (5.00) on the relevance of its E-learning platforms and content. This results in a moderate to high overall risk score of 3.3846, signifying a serious concern that demands continuous strategic attention and investment.

Challenge 8 finds out that the university acknowledges that competition in advanced E-learning from other institutions is an ever-present reality and it carries a high potential for significant impact (4.00) on its competitive position. This results in a moderate to high overall risk score of 3.1538, indicating that despite the perceived low likelihood of immediate severe erosion of position, the Challenge demands strategic monitoring and proactive measures.



Implications for Pakistan

Building upon the identified implementation challenges, the findings of this study carry significant implications for the strategic advancement of e-learning in Pakistan. To truly maximize the full strength of digital education, Pakistani institutions must prioritize substantial investment in expanding strong digital infrastructure and significantly improving nationwide internet connectivity. Concurrently, efforts to ensure digital equity should include providing accessible devices to learners. Furthermore, a major focus on comprehensive faculty professional development is essential to develop the necessary competencies for high-quality online instruction. Crucially, existing policy frameworks at both institutional and national levels must be revised to fully integrate e-learning as a strategic component of Pakistan's educational landscape, thereby ensuring sustainable growth and equitable access.

Conclusion and Recommendations

Conclusion

E-learning represents a significant opportunity for universities to fulfill their educational objectives efficiently. It provides an accessible and cost-effective educational solution that is available anytime and anywhere. As a key source of information, e-learning fosters interactive learning environments that benefit students and enhance teachers' technical and professional skills, specifically in e-pedagogy, while also strengthening the e-capacities of institutions. Several critical factors influence the implementation of E-learning in emerging economies, including electricity availability, internet bandwidth, ICT infrastructure, language and computer literacy, funding, policies, objectives, local research, and awareness. The success of E-learning programs in these contexts hinges on carefully considering the diverse and crucial factors. While developing countries are facing challenges primarily related to the individual aspects of E-learning. These challenges, include unstable electricity, slow internet connectivity, budget limitations, inadequate ICT infrastructure and literacy, resistance to change, and management difficulties, have impeded the adoption and effectiveness of E-learning in these nations. Addressing these issues requires comprehensive planning and targeted strategies to

facilitate the successful implementation of E-learning in emerging economies.

Recommendations

To effectively advance e-learning, strategic investment in infrastructure is essential to improve internet accessibility and ensure the provision of appropriate digital devices for both educators and learners. Continuous professional development programs should be implemented to equip faculty with the necessary skills in online pedagogy and the use of digital tools. Furthermore, the formulation of comprehensive policies and incentives is critical to institutionalize e-learning within national education systems. Enhancing student support through increased opportunities for live interactions, webinars, and collaborative peer engagement is also imperative. Lastly, targeted awareness campaigns are required to foster public confidence in the credibility and value of online degrees.

Limitation and future research

It is essential to recognize the limitations of this study. Examining the challenges and opportunities in e-learning implementation is highly context-specific and may not encompass the diverse and unique nuances of all emerging economies. Additionally, the findings of this study are subject to change as technological advancements and educational landscapes continue to evolve. Future research should focus on exploring adaptive strategies to address these growing challenges, assessing the long-term impact of E-learning on academic outcomes, and examining the effectiveness of specific interventions in overcoming infrastructure-related barriers in various emerging contexts.

References

Al-Handhali B. A., Al-Rasbi A. T., and Sherimon P. C., 2020. Advantages and disadvantages of earning Management System (LMS) at AOU Oman. *International Journal of Technology, 1(2),* 222-228.

ALLEN, I. E. & SEAMAN, J. 2011. Going the Distance: Online Education in the United States, 2011, ERIC**.**

Andersson, A. & Grönlund, Å., 2009. A Conceptual Framework for E-Learning in Developing Countries:A Critical Review of Research Challenges. *The Electronic Journal of Information Systems in Developing Countries, Volume 38, pp. 1-16.*

Basar, S., Rahatullah, Nawaz, A. & Adnan, A., 2013. Net Generation, Threats & Opportunities for Higher Education Institutes. *Life Science Journal, 10(12),* pp. 372-377.

Bhuasiri, W. et al., 2012. Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. Computers & Education, Volume 58, pp. 843-855.

BITZER, D. L., BRAUNFELD, P. G. & LICHTENBERGER, W. 1962. PLATO II: A multiple-student, computer-controlled, automatic teaching device. Programmed learning and computer-based instruction, 205-216.

BOTTINO, R. M. 2004. The evolution of ICT-based learning environments: which perspectives for the school of the future? *British Journal of Educational Technology, 35*, 553-567.

Critical success factors for successful e-learning implementation: A case study in Dinamika University, Indonesia (School of Science and Technology, Asia e University).

Georgiev, T., Georgieva, E. and Smrikarov, A., 2004. M-learning - a new stage of e-Learning. In: K. Boyanov, ed. International Conference on Computer Systems and Technologies - CompSysTech'2004. Rousse, Bulgaria,17-18 June 2004. New York: Association for Computing Machinery.

Holmes, B. and Gardner, J., 2006. E-Learning: Concepts and practice. London: Sage.

Kanwal, F., & Rehman, M. (2014). E-learning adoption model: A case study of Pakistan. Department of Computer Science, Lahore College for Women University, Lahore, Pakistan.

Kearney, M., Schuck, S., Burden, K. and Aubusson, P., 2012. Viewing mobile learning from a pedagogical

perspective. Research in Learning Technology, 20(1), pp.1-17. https://doi.org/10.3402/rlt.v20i0/14406

Khan, M. Z., Miankhel, A. K. & Nawaz, A., 2013. Information & Communication Technology and 'Individual': Prospects & Concerns. Global Journal of Computer Science and Technology Network, Web & Security, 13(7).

Maatuk AM, Elberkawi EK, Aljawarneh S, Rashaideh H, Alharbi H (2022) The COVID-19 pandemic and E-learning: challenges and opportunities from the perspective of students and instructors. *J Comput High Educ 34(1)*:21–38.

MCGORRY, S. Y. 2003. Measuring quality in online programs. The Internet and Higher Education, 6, 159-177.

Nawaz, A. & Khan, M. Z., 2012. Issues of Technical Support for e-Learning Systems in Higher Education Institutions. *I.J.Modern Education and Computer Science, Volume 2, pp. 38-44*.

Nawaz, A. & Kundi, G. M., 2010. Demographic Implications for the User-Perceptions of ELearning in Higher Education Institutions of NW.F.P, Pakistan. *The Electronic Journal of Information Systems in Developing Countries, Volume 41, pp. 1-17.*

Nawaz, A., 2012. E-Learning experiences of HEIs in advanced states, developing countries and Pakistan. *Universal Journal of Education and General Studies, 1(3),* pp. 72-83.

Nawaz, A., 2013. Using e-learning as a tool for 'education for all' in developing states. *International Journal of Science and Technology Educational Research, 4(3)*, pp. 38-46.

Qureshi, I. A., Ilyas, K., Yasmin, R. & Whitty, M., 2010. Challenges of implementing e-learning in a Pakistani university. *Knowledge Management & E-Learning: An International Journal, 4(3), pp. 310-324*.

Saikat S, Dhillon JS, Wan Ahmad WF, Jamaluddin RA (2021) A systematic review of the benefts and challenges of mobile learning during the COVID-19 pandemic. Educ Sci 11(9):459. https://doi.org/10.3390/educs ci11090459

Verduin, J. R., & Clark, T. A. (1991). Distance education. Oxford: Jossey-Bass Publisher

WOOLLEY, D. R. 1994. PLATO: The emergence of online community. Computer Mediated Communication Magazine, 1, 5.