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RESEARCH PAPER

Enhancing Teacher Performance in E-Learning: Addressing Barriers and Promoting Sustainable Education in Public Universities of Pakistan

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ABSTRACT

This study investigates the barriers affecting teacher performance in e-learning public sector universities, aiming to propose solutions aligned with Sustainable Development Goal 2030. The global impact of COVID-19 necessitated technological interventions to facilitate education and development, with e-learning emerging as a crucial strategy. However, challenges persist, especially in Pakistan's public-sector universities. Using qualitative methods, nine participants were interviewed to uncover different internal (motivation, teaching methods, assessment) and external (technical assistance, financial crises) barriers face by teaching faculty. Recommendations include investing in technical infrastructure, collaborating with policymakers and developers, and prioritizing technology integration at the different level according to need of modern globe. These suggestions aim to promote inclusive and quality education, leveraging technology for improved outcomes. By addressing these barriers, universities can contribute to universal access to education and empower learners in the digital age. Strategic investments and collaborative efforts are vital to advancing educational equity and lifelong learning.

KEYWORDS Barriers in Teaching, E-Learning, Post-Pandemic Era, Public Universities, Teaching, Performance

Introduction

The year 2020 was declared an epidemic year by the World Health Organization (WHO) due to the global impact of COVID-19 on millions of lives and educational systems (World Health Organization, 2020). In response to this crisis, various technological interventions were implemented to facilitate teaching and learning processes (Shahzad et al., 2021). Modern technologies have expanded the scope of education beyond traditional classroom settings, serving as effective communication tools for teachers and students (Dawes, 2001). Dawes (2001) emphasized the potential of Information and Communication Technology (ICT) in revolutionizing educational practices while also acknowledging the challenges faced by educators in implementing these changes (p. 61). Turkle (2006) highlighted the profound impact of technology on human behavior and societal dynamics, underscoring the need for a nuanced understanding of its effects.

E-learning endeavors to impart essential skills to individuals needing access to formal classroom settings. In the contemporary era, using ICT strategically is crucial to enhancing educational opportunities (Bingimlas, 2009). This study analyses the challenges and best practices in distance education to identify key factors influencing the educational process. Despite efforts by governmental and non-governmental entities to promote such programs in Pakistan, there remains a need for increased emphasis and support from the

public sector. Khan (2012) emphasized the importance of specialized services in the modern field of study, underscoring the need for tailored approaches to teaching and learning. The transformative impact of ICT on education underscores the importance of developing innovative policies and programs to enhance e-learning initiatives (Khan et al., 2012).

In recent years, the educational system in Pakistan has seen notable changes, especially with the rise of e-learning as a crucial element in teaching and learning approaches. The emergence of the COVID-19 pandemic in 2020 highlighted the significance of e-learning in guaranteeing continuous access to education throughout unprecedented difficulties. It is crucial to comprehend and tackle the obstacles that affect teacher effectiveness in e-learning environments as public universities in Pakistan struggle with the shift to online learning methods.

Research conducted by Asad et al. (2020) has emphasised the significant impact of Information and Communication Technology (ICT) on education, particularly in terms of improving teaching effectiveness and promoting learning outcomes. Nevertheless, despite the increasing focus on e-learning programmes, educators in public universities require assistance in incorporating technology into their instructional methodologies.

Mercader's (2020) Exploratory Model of Barriers (EMB) offers useful insights into the complex challenges that instructors confront while implementing ICT in education. Although Mercader's model provides statistical insights based on quantitative data, there remains a lack of comprehension of the valuable qualitative data collected through interviews. This study seeks to enhance the EMB model by exploring educators' personal experiences and viewpoints. The goal is to gain a more comprehensive knowledge of the obstacles that impede teacher performance in e-learning environments.

Furthermore, the study is in accordance with the Sustainable Development Goal 2030 (SDG, 2030), which highlights the significance of advancing inclusive and high-quality education for everyone. This research focuses on identifying and overcoming obstacles that hinder teacher performance in e-learning. By doing so, it contributes to the worldwide endeavor of ensuring that everyone has equal access to education and promoting chances for continuous learning throughout their lives.

The study's background emphasizes the pressing necessity to identify and overcome the obstacles that hinder teacher performance in e-learning at public universities in Pakistan. This study aims to utilize qualitative research methods and adhere to the principles of SDG 2030 in order to provide valuable insights for policy and practice. The ultimate goal is to improve the effectiveness of e-learning efforts and ensure equal access to high-quality education.

Literature review

According to Thomas, Khan, and Ahmad (2022), the incorporation of technology into educational settings constitutes a substantial paradigm change in contemporary educational practices. This transition ushers in a new era of pedagogical innovation and improved learning outcomes. The availability of cutting-edge technology makes it easier to disseminate information and creates an atmosphere that is conducive to learning, which in turn increases the likelihood of academic achievement. There have been a number of studies that highlight the transformative impact that e-learning has on the engagement and motivation of students. According to findings from a study that was carried out by the Pew Research Centre in 2016, it was discovered that pupils in the United States who were

exposed to modern technological tools within educational settings exhibited increasing levels of passion and desire towards learning. In a similar vein, Oduma et al. (2019) discovered that there is a significant connection between the successful implementation of e-learning initiatives and increasing levels of student satisfaction, particularly in the context of higher education institutions.

In addition, e-learning provides unique personalised learning experiences that adapt to a wide variety of learning styles and interests. Through the utilisation of multimedia resources, interactive simulations, and adaptive learning platforms, educators are able to personalise instructional content in order to cater to the specific requirements and preferences of each individual student (Johnson et al., 2020). According to Oad and Alwi (2021), this personalised method improves comprehension and retention, as well as nurtures a deeper appreciation for the subject matter, which eventually leads to the promotion of learning that continues throughout one's life.

Not only does e-learning eliminate geographical boundaries, but it also makes it possible for people from all walks of life and socioeconomic backgrounds to have equal access to high-quality education. According to Alraimi et al. (2015), the introduction of Massive Open Online Courses (MOOCs) and digital learning platforms has brought about a revolution in the educational environment. These developments have made it possible for students all over the world to gain access to educational resources and knowledge of the highest possible quality. According to Imran and Akhtar (2023), the democratisation of information gives individuals the ability to pursue their educational goals and realise their full potential, regardless of the limitations that have traditionally been imposed on them regarding education.

In learning environments that use technology to their advantage, there is a sense of community and collective learning. These environments encourage collaboration and the sharing of knowledge among peers. Students can engage in meaningful conversation, exchange ideas, and cooperate on projects through the use of online forums, virtual classrooms, and collaborative projects (Wang & Baker, 2018). This allows students to cultivate crucial collaboration and communication skills. This collaborative learning paradigm is designed to replicate the professional environments that learners will encounter in the real world. It provides learners with the knowledge and abilities necessary to flourish in a society increasingly digitally driven and networked (Ali et al., 2023).

Barriers to E-learning at Higher Education in Pakistan

Pakistan's higher education system is confronted with many issues, ranging from structural shortcomings to systematic injustices for students. These impediments prevent the realization of an inclusive and high-quality education for all individuals, hence perpetuating gaps and impeding the growth of socioeconomic conditions. It is possible to better understand the complex nature of educational issues in the context of Pakistan by conducting a thorough investigation of these obstacles.

According to Aziz et al. (2014), one of the most significant problems is the need for proper training for faculty members, which is a factor that leads to a decline in the quality of education and a barrier to academic excellence. A further issue is that outmoded curricula cannot accommodate the ever-evolving requirements of students and the requirements of a quickly changing global landscape. This results in education becoming stagnant and isolated from the relevance of the real world. Furthermore, discrepancies in access to educational opportunities continue to exist, which perpetuates inequities that are based on gender and geographic location, which are present in different provinces.

Even though teachers and students are showing a growing interest in e-learning and information and communication technology (ICT), substantial obstacles prevent successfully incorporating these technologies into the teaching and learning processes. Even though e-learning materials have the potential to improve education quality, Asad et al.'s research (2021) found that institutions frequently need additional resources and infrastructure to support faculty members in adopting these new techniques. In addition, the absence of institutional support and incentives is another factor that prevents faculty members from adopting e-learning projects. This, in turn, impedes efforts to modernize educational techniques and improve student outcomes.

Urbanization, globalization, and environmental degradation are global challenges that pressure educational institutions worldwide (Crawford et al., 2020). These concerns further complicate the current educational landscape, which is already complex and challenging. The COVID-19 pandemic, which has exposed flaws in educational systems and undermined the efficacy of conventional modes of instruction, has made these challenges even more difficult. According to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), in response to these unprecedented challenges, international organizations have advocated for the widespread adoption of e-learning and the integration of digital technologies into educational institutions in order to guarantee the continuity of learning and enhance educational resilience (UNESCO, 2020).

In conclusion, to solve the myriad of obstacles that stand in the way of education in Pakistan, policymakers, educators, and other stakeholders need to undertake a concentrated and comprehensive effort. It is possible for Pakistan to cultivate a conducive learning environment that encourages academic excellence, encourages innovation, and empowers learners to succeed in the 21st century if the country invests in the development of its faculty, the reform of its curriculum, and the upgrade of its infrastructure.

Teacher Training

The landscape of teacher training in Pakistan's higher education sector and programs that are supervised by the Higher Education Commission (HEC) frequently adhere to methodologies that are considered to be standard in terms of approach to education. However, there is a rising acknowledgment of the necessity of incorporating technology into teacher training programs in order to improve the outcomes of both teaching and learning (Butt et al., 2020). In the context of e-learning environments, researchers have identified a number of essential components of teacher training, providing light on areas that require attention and improvement (Asad, et al., 2021).

On the other hand, Smolyaninova and Bezyzvestnykh (2019) carried out an exhaustive investigation that brought to light important concerns with the training of teachers for e-learning. One of the most significant concerns is the definition and development of material that is specifically designed for digital platforms. This calls for the use of contemporary instructional strategies and the efficient incorporation of information and communication technology tools in a variety of educational environments. In addition, the research highlights the significance of strengthening the competences and skills of information and communication technology (ICT) instructors in order to effectively apply new teaching approaches and navigate the ever-changing digital landscapes (Assareh & Bidokht, 2011).

In addition, the research highlights the significance of employing adaptable assessment methods, such as electronic portfolios and Learning Management Systems (LMS), in order to accommodate a variety of learning styles and to encourage the

development of personally tailored educational experiences. Additionally, there is a need to establish effective teaching strategies and methodologies for e-learning environments. This is necessary in order to guarantee that educators possess the necessary skills to capture the attention of students and motivate them to learn in digital classrooms.

When these findings are expanded upon, it becomes clear that comprehensive teacher training programs ought to incorporate a wide range of skills and abilities that are pertinent to e-learning. To do this, one must be proficient in both software and hardware devices, possess pedagogical competence in contemporary teaching methods, and be able to utilize information and communication technology tools in order to improve the delivery of instruction and the level of student involvement (UNESCO, 2013). In addition, it is vital to provide educators with chances for continual professional development in order to guarantee that they are able to keep up with the latest pedagogical trends and emerging technologies. This will enable them to modify their teaching methods in order to suit the ever-changing requirements of students who are learning in digital settings (UNESCO, 2017).

A holistic approach that incorporates curricular reform, pedagogical innovation, and professional development activities is required in order to address the myriad of issues that are connected with teacher training in e-learning. Pakistan is able to cultivate a cadre of teachers who are skilled and empowered, capable of harnessing the transformative potential of technology to enhance teaching and learning outcomes in the digital age. This can be accomplished by investing in the continuous improvement of teacher training programs and providing educators with the necessary support and resources.

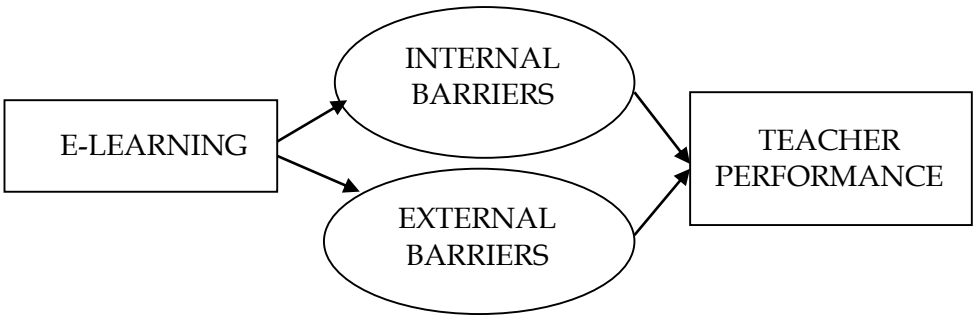

Figure 1: Conceptual Model

Theoretical Background

Mercader (2020) introduced the Exploratory Model of Barriers (EMB), which provides valuable insights into the challenges encountered by teachers during the integration of Information and Communication Technology (ICT) into their instructional practices. This model serves as a framework for understanding the multifaceted nature of these barriers and offers a basis for developing effective strategies to address them. However, while Mercader's model offers valuable statistical insights derived from quantitative data, it overlooks the rich qualitative data gathered through interviews, representing a potential gap in understanding.

Building upon Mercader's foundational work, this study seeks to complement the EMB model by incorporating qualitative data from interviews with faculty members. By delving deeper into educators' lived experiences and perspectives, this research aims to identify additional barriers and nuances that may not be captured solely through

quantitative analysis. Through a comprehensive examination of qualitative data, the study endeavours to provide a more holistic understanding of teachers' challenges in integrating ICT into their instructional practices. Findings from qualitative sources enrich existing knowledge and offer actionable insights for policymakers, administrators, and educators. Ultimately, by identifying and addressing a broader spectrum of barriers, this research strives to inform the development of more targeted and effective strategies to support teachers in leveraging technology to enhance teaching and learning outcomes.

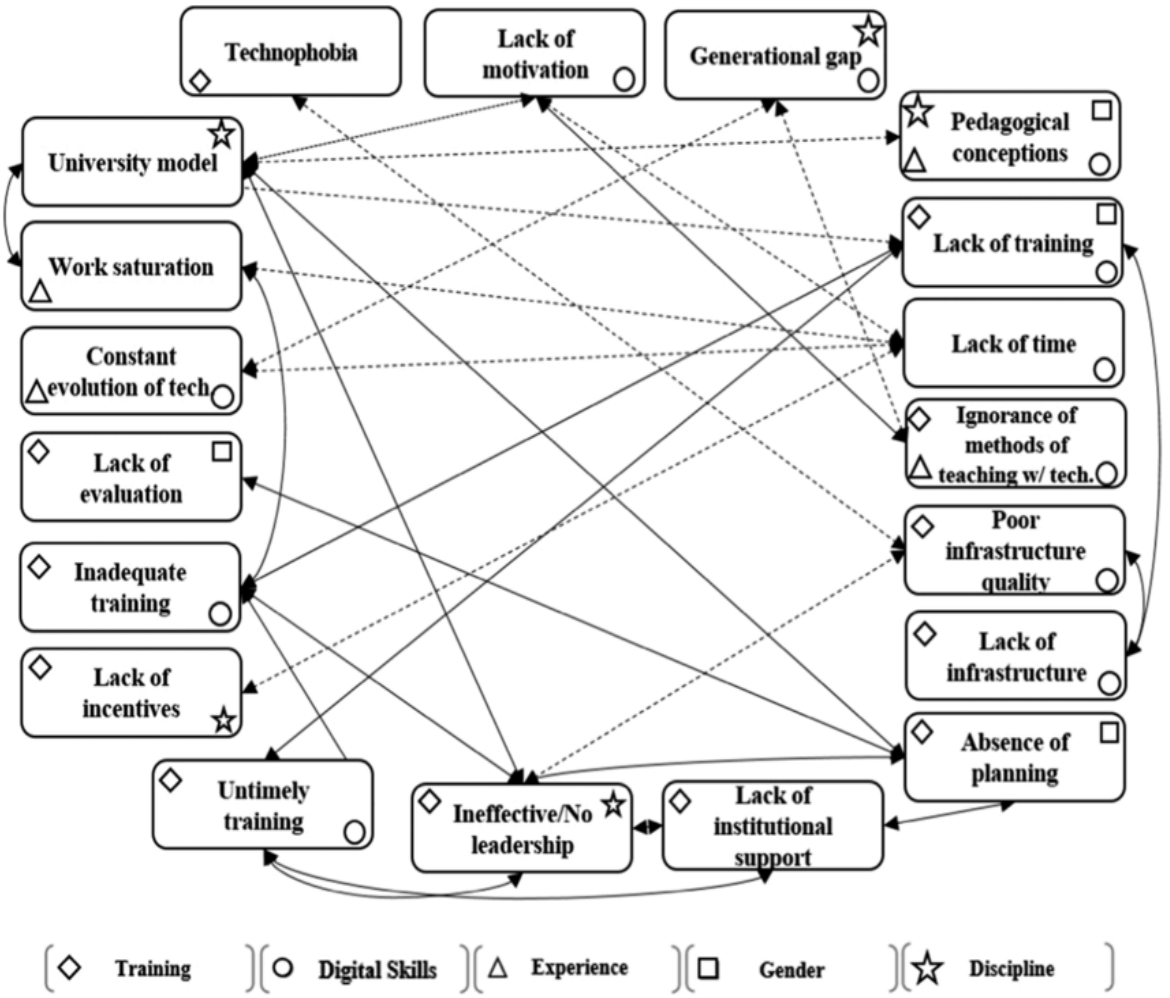

Figure 2: Model

Material and Methods

The primary objective of this study is to investigate the barriers impacting teacher performance in e-learning within public universities in Pakistan. For research inquiries to be effective, a qualitative research design was employed. Nine participants were purposefully selected for their diverse professional backgrounds, extensive experience in e-learning, varied qualifications, and demographic characteristics, including age and gender. The selection process was facilitated through a stratified random sampling technique, ensuring representation across relevant demographics.

Data collection involved in-depth interviews with the selected participants, allowing for the exploration of their perspectives, experiences, and insights regarding the challenges encountered in e-learning environments. Thematic analysis was employed as the primary method for data analysis, enabling the identification of recurrent themes, patterns, and insights emerging from the participants' narratives. Through this rigorous

analytical approach, the study aimed to uncover the multifaceted barriers hindering teacher performance in e-learning settings within the context of public universities in Pakistan.

Table 1
Demographics of the participants

No. of Participants	Gender	Training	Age	Qualification	Experience
2.	Male	C.E, S.E	30-40	Master/Ph.D.	5-10
2.	Male	I.T	40-50	Master/Ph.D.	10-15
2.	Female	S.E, I.T	30-40	Master	5-10
3.	Female	C.E, I.T	40-50	Master	10-15

Male and female participants were recruited in an equal proportion, and they were between the ages of 40 and 50 years old. They all held Ph.D. degrees in their respective respective disciplines. Similar to the previous participant, the other participants, who were between the ages of 30 and 40, had earned master's degrees in Energy Environment Engineering and Mass Communication from a variety of universities. In addition to this, they have previous teaching experience, either in traditional classrooms or online during the COVID-19 period. Semi-structured interview questions were asked to all of the participants, and these questions were triangulated with the assistance of the literature and peer review.

Confrontational interviews, on the other hand, were carried out in order to acquire the necessary data. Before anything else, written authorization was obtained. The majority of the participants, particularly the teachers that took part, had a great deal of expertise. For the purpose of theme analysis, grounded theory was utilised to summarise the interviews in the form of categories and groups. Following that, a list of ideas was compiled according to the opinions of the participants.

Findings and Discussion

"Data were analysed using inductive and thematic analytics to identify, evaluate, and make a theme expressed by participants", according to (Galloway and Jenkins, 2005) it was discovered that there are many different obstacles that are impacting the performance of teachers, and many of the possible solutions to these obstacles were also given by the respondents. According to the data, the following are the most significant obstacles:

Internal Barrier Dimensions

Motivation

In e-learning, the motivation of teachers is a crucial factor. Utilising and putting into practice the most recent technology is essential to achieving success, however it was discovered that this was not being done for a number of reasons. Some of these reasons include a lack of fluency in the English language, reluctance to change on the part of the instructor, and a lack of information regarding e-learning. It is argued in the learning prolongation that the motivation of teachers in the use of technology in the classroom is vital in order to achieve long-term outcomes (Jasperson, Carter, and Zmud, 2005).

A large number of academics have investigated the many obstacles that have an impact on the performance of teachers. In particular, teacher training for the most recent technology is vital in e-learning since a lack of technical abilities will have a significant

impact on the instructor's confidence. Because of a lack of familiarity with developing technology, it may be possible to avoid getting involved (Oad, Khan, and Khoso, 2020).

Teaching Methods and Material

According to Zhoo and Bryant (2006), there is a gap between teachers and technology in terms of pedagogy, which means that teachers do not have enough integration of technology. When students participate in cooperative learning and group projects, it can boost their self-confidence and give them the ability to compete in the digital world. There is a substantial relationship between the use of proper course content and the presentation of material and the efficiency with which teachers accomplish their duties in e-learning. When it comes to education, whether it be official or informal, the curriculum serves as the organization's main structure. For such online classes, the task of developing a curriculum that is suitable falls on the shoulders of those who establish policy. For example, "the e-learning system is an alternative source of the traditional system of teaching and e-learning materials are as effective as face-to-face learning materials" (Khan, S. B., & Jumani, N. B., 2012) is what the findings of a comparison study in the general classroom and e-learning have shown to be the case.

Assessment Process in E-learning

Taking the necessary examinations and conducting an accurate evaluation of one's progress is also an essential step in the process of accomplishing the goals that have been set. Therefore, it is necessary to ensure that the evaluation procedure is both fair and transparent, and the instructor should provide appropriate feedback in order to accomplish the goals that have been anticipated. There were only a few individuals who declined to answer, which indicates that there was insufficient evaluation and feedback. There is a conflict between the amount of time that teachers need to devote to teaching and the fact that the majority of respondents have shown interest in the reform of the curriculum structure and standards that place an emphasis on the study of related studies for overall academic achievement. Shared assessment is very important for learning practice and its assessment because it involves the student in the assessment process; collaboration between the teacher and the student; and a dialect process in any mode, whether individually or collectively, with the goal of achieving an effective teaching and learning process (López-Pastor, V., & Sicilia-Camacho, A. 2017).

External Barriers Dimensions

Technical Assistance

The provision of technical help is an essential component of online education, and it plays a significant part in enhancing the effectiveness of lecturing. "Educators are not efficiently using computers as they should suffer with the emergence of rapidly changing technologies, it should keep in mind that learners must have to know and learn new skills and practice new knowledge", according to (Wells and Lewis, 2006). The people who participated in the survey talked about the problems that arise while attempting to teach using the most recent technology in e-learning. These problems include outdated technological infrastructure and a lack of information regarding the most recent forms of technology. Therefore, due to the expensive cost of technology and opposition to bringing about change, the public universities of Sindh mostly support the conventional classroom mode of studies in higher education. This is in contrast to online programs, which are becoming increasingly popular. Taking this into consideration, technical assistance might be able to fill the void in the necessary field.

Financial Crises

The majority of those who participated in the survey expressed concern regarding the financial challenges they have when teaching with the most recent technological instruments. For a significant amount of money, the most recent technological devices demand a significant amount of implementation and upkeep. As a result of this consideration, organisations are required to enhance these facilities, which include software, hardware, connectivity to the internet, and adequate technical assistance (Khan, S. B., & Jumani, N. B., 2012). The performance of teachers is a highly significant component in e-learning, and technical aid helps teachers meet their performance goals. Furthermore, in order to enhance the academic performance of both teachers and pupils at the school level, the majority of nations spend a significant amount of money on the acquisition of cutting-edge technology and telecommunication networks (Hew and Brush, 2007).

In addition to the obstacles that have been identified, ineffective techniques that disrupt the electricity systems and a slow connection to the Internet can also have an impact on the effectiveness of teachers that are engaged in e-learning efforts. This study may be of assistance to the public universities of Sindh in addressing the barriers that are hurting teaching performance. The solutions that are advised would be helpful in developing teaching skills in the context of the integration of e-learning. In addition, those responsible for the development of technology and policy should look for potential solutions, offer recorded lectures that include some exercises for students to practice, create question-answer pattern assignments, and provide students with prompt feedback.

Additionally, in order to encourage the younger generation to participate in online education, the most recent technology ought to be implemented at the elementary level. For the government to be able to accomplish better results, more monies should be allocated.

Conclusion

The findings of this study shed light on a multitude of barriers hindering teacher performance in e-learning within public universities in Pakistan. Through inductive and thematic analysis, internal and external dimensions of these barriers were explored, providing valuable insights into the challenges faced by educators in integrating technology into their instructional practices. Internal barriers such as motivation, teaching methods and materials, and the assessment process were identified as significant impediments to teacher performance in e-learning. A lack of English language proficiency, resistance to change among instructors and limited e-learning knowledge were highlighted as key factors undermining teacher motivation. Additionally, gaps in pedagogical skills and insufficient technology integration into teaching methods were identified as areas requiring attention. External barriers, including technical assistance and financial crises, further exacerbated the challenges faced by educators. Outdated technology infrastructure, lack of awareness of emerging technologies, and financial constraints emerged as prominent issues hindering effective e-learning implementation.

Recommendations

To address these barriers and enhance teacher performance in e-learning, several recommendations are proposed:

1. Public universities in Sindh should invest in technical assistance and upgrade technology infrastructure to support educators in integrating technology into their teaching practices.

2. Policymakers and technology developers should collaborate to develop user-friendly e-learning tools and platforms, facilitate the creation of recorded lectures, interactive exercises, and assignments, and ensure prompt student feedback mechanisms.

3. There is a need to prioritize introducing the latest technology at the primary level to foster early engagement with e-learning among students.

Furthermore, the government must allocate sufficient funds to support these initiatives and promote equitable access to quality e-learning resources across educational institutions. By implementing these recommendations, public universities in Sindh can effectively address barriers to teaching performance in e-learning and cultivate a more conducive learning environment for students.

Integration with SDG 2030

Aligned with Sustainable Development Goal 2030, these recommendations aim to promote inclusive and quality education for all, ensuring equitable access to educational opportunities and fostering the development of 21st-century skills among learners. By leveraging technology to enhance teaching and learning outcomes, Pakistan can contribute to the global effort to achieve universal access to education and empower individuals to realize their full potential.

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