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ONLINE LEARNING IN PAKISTAN: A CRITICAL REVIEW OF EXISTING LITERATURE

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ABSTRACT
The field of online learning in Pakistan gained prominence during the coronavirus pandemic. Due to the COVID-19 pandemic, the number of people using online learning grew significantly. Campuses of educational institutions went online due to the pandemic. Educational institutions used the internet to continue with their education. Many institutions adopted learning management systems to deliver courses. This alteration of the teaching environment was encouraged by this immediate shift. This abrupt shift in connectivity revealed the possibilities and drawbacks of online education. Although there is increasing interest in digital education, online education remains a somewhat underexplored area of research in Pakistan. A lot of research is devoted to online classes and students' experiences. The existing literature indicates that researchers have primarily investigated teachers' preparedness for digital instruction. Other papers examine the role of technology in online learning. Some researchers explored student engagement in online settings. Some of the works examine the proficiency of online pedagogical practices. The level of student satisfaction with digital learning is also a subject of study by researchers. The studies add to the literature on the increased area of online learning. They are also useful in enhancing the digital teaching methods. Nevertheless, online learning has yet to be studied for its effectiveness. Therefore, this study aims to critically review the existing literature on online learning in Pakistan.

Keywords: Online learning, distance learning, e-learning, higher education, digital learning

INTRODUCTION

Online learning has become a vital part of modern education. Learning activities are now supported by digital technologies worldwide. The internet allows students to access learning materials. Educators can deliver lectures through multiple digital platforms. Many universities are currently using learning management systems. These systems facilitate the assigning, communication, and assessment. Learning through the Internet enables students to learn from various places. It also enables the students to study at other times. This has enhanced learning among various students. Lifelong learning and professional development are also facilitated through online learning.

Online learning has been made easier by technological development. Most countries have enhanced access to the internet. There is the use of digital devices, including laptops and smartphones. These gadgets enable students to participate in online classes. The education systems have also improved. Online learning can be supported by tools such as Moodle or Google Classroom. Live lectures and discussions are supported using video conferencing tools. Online learning is more interactive with these technologies. Recording lectures also allows the students to access them when required. The developments have increased the learning opportunities in most education systems.

Due to the COVID-19 pandemic, the number of people using online learning grew significantly. Campuses of educational institutions went online due to the pandemic. Educational institutions migrated to the internet to continue with their education. Educationists began giving talks using video conferencing devices. Students took classes from the comfort of their homes. Many institutions adopted learning management systems to deliver courses. This alteration of the teaching environment was encouraged by this immediate shift. This was the time when online learning became the primary way of learning. The pandemic thus boosted

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the digital transformation in learning. Online learning is still used by many institutions post-pandemic.

The scholars have begun looking at various issues concerning online learning. A lot of research is devoted to online classes and students' experiences. Researchers also investigate teacher preparedness for digital instruction. Other papers examine the role of technology in online learning. Other researchers explore student engagement in online settings. Some of the works examine the proficiency of online pedagogical practices. The level of student satisfaction with digital learning is also a subject of study by researchers. The studies add to the literature on the increased area of online learning. They are also useful in enhancing the digital teaching methods. Nevertheless, online learning has yet to be studied for its effectiveness.

Online learning offers several benefits to both students and institutions. Students can access course materials anywhere, at any time. Flexible learning timetables are also promoted using online learning. This enables working students to continue studying. Collaborative learning activities are also supported on digital platforms. Discussion forums allow students to share ideas with fellow students. Online examinations give instant feedback to the students. The teachers can share multimedia materials to facilitate learning. These capabilities enhance student interest in most courses. This has led to an increase in the number of universities that embrace online learning systems.

Online learning is not adopted uniformly across countries. The digital infrastructure is usually more powerful in developed countries. These countries have universities that embrace advanced learning technologies. Students are probably well-connected to the internet and digital media. These are favorable online learning conditions. On the contrary, developing countries face various digital challenges. Internet connectivity can be available in a few areas. Learning institutions might be low on technology. Financial barriers might also come into play in students' access to technology. These are among the factors affecting the evolution of online learning systems.

Digital education is also changing in Pakistan. There has been a focus on online learning in recent years. Digital learning platforms have been adopted in many universities. The COVID-19 pandemic enhanced this transition to online learning. Educational institutions moved their lessons online. The lectures were delivered by teachers using video conferencing equipment. Students were concentrating on their classes using digital devices. Assignments and course communication were assisted through learning management systems. This unforeseen change presented both prospects and problems. Online learning is currently taking up an entry into the educational system.

Nevertheless, the Pakistani education system is mainly based on traditional, face-to-face teaching. Teaching in a classroom has been the prevailing way of teaching. Before the pandemic period, online learning was restricted. Structured online programs were available only at several institutions. The most common learning institutions did not embrace digital learning. The pandemic thus compelled institutions to embrace online teaching at a rapid pace. Most educators were not very familiar with online platforms. The students also had to adjust to online learning. This shift indicated several structural and technological dilemmas. It also indicated the need for more robust digital education systems.

Various issues have influenced the practice of online learning in Pakistan. Several students had a poor internet connection. Elsewhere in rural areas, digital network coverage was low. Some students did not have access to laptops or smartphones to take online classes. The electricity shortage also interrupted online learning. Other challenges included teachers' use of digital tools. There was a dearth of training in online pedagogies amongst many teachers. There was also a problem with how institutions handled online learning systems. These issues affected

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the quality of digital learning. Therefore, the results of online learning were different among the students.

Despite these challenges, online learning brought new possibilities in Pakistan. Universities began to seek blended learning methods. Through blended learning, teaching combines online instruction and classroom instruction. This method offers flexibility in learning. Innovative teaching can also be done with the assistance of digital tools. Multimedia can be used in courses taught by teachers. Educational material can also be accessed more easily through online platforms. The opportunities promote the further expansion of online learning. Colleges are investing more in digital learning technologies now. These advancements can enhance the future of internet learning.

Researchers in Pakistan are studying online learning experiences. Numerous researchers are concerned with students' perceptions of online classes. Teachers are also ready to teach digitally, according to some studies. Other papers examine the technological issues in online learning. They also test students' digital engagement. There are a few studies on institutional responses to online education. The studies are very useful in online learning practices.

Current studies on online learning in Pakistan also reveal shortcomings. A large number of studies focus on the immediate experience of the pandemic. Not many studies study the outcomes of long-term learning. Some studies have small sample sizes. Some are centered on an institution or a specific region. These will decrease the applicability of research outcomes. Numerous studies focus solely on students' viewpoints. There are fewer studies involving teachers, administrators, or policymakers. There is also limited research on digital learning equity. Thus, it is necessary to conduct a more general review of the literature.

It is, however, important to do a comprehensive review of the available research. Literature reviews help organize the available knowledge on a subject. They identify patterns and trends in past research. Existing gaps in research are also brought to the fore in literature reviews. The critical review is particularly effective in the discovery research. Pakistan Online learning is a nascent research area. The available literature is distributed in various journals and fields. This research can be synthetically compiled through a systematic examination. It may also inform subsequent research undertakings.

The study, hence, undertakes a critical literature review. The analysis is about web-based education in Pakistan. It explores key themes in other research studies. It also finds limitations and research gaps in the literature. These gaps are important for future research development. The purpose of the review is to summarize the existing information on online learning. It also attempts to give guidelines on future research. The results can benefit researchers and teachers. They can also enlighten education policymakers.

In summary, online learning is becoming more important in modern education. Pakistan is gradually adopting digital learning methods. However, research on this subject remains limited and incomplete. There are still several technological and institutional challenges. Meanwhile, online learning provides new learning possibilities. These issues can only be fully understood in the light of the existing studies. Significant gaps in research can be established through a critical analysis of the literature. This analysis can inform future research and policy formulation. The work can, hence, contribute to the body of online learning research in Pakistan.

METHODOLOGY

This research uses a literature review strategy to examine studies on online learning in Pakistan. A literature review helps organize existing information on a specific topic. It also helps identify trends and gaps in prior research and findings. This review will analyze studies on online learning. The paper focuses on Pakistani-based research. Past studies were reviewed to identify key themes in the literature. Limitations in the current studies are also found in the

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review. The method offers systematic knowledge of the research area. It is also helpful in identifying key gaps in research.

The relevant research articles were collected using a systematic search strategy. Several scholarly databases were utilized to find research. Google Scholar, Scopus, and Web of Science were some of the databases addressed. These sources are peer-reviewed scholarly studies. Google Scholar was very convenient, especially for educational research. Relevant studies were identified using keywords. Keywords such as online learning, e-learning, and digital learning in Pakistan were common. Others, such as online education and distance learning in Pakistan, were also used as keywords. These terms were used to find studies on the research topic. The search included publications with article titles in scholarly journals and conference proceedings.

The initial articles were collected, followed by screening. The screening procedures helped eliminate irrelevant studies. Firstly, titles and abstracts were scanned. There was an exclusion of studies that were not on Pakistan. The articles unrelated to online learning were also eliminated. Only studies related to education and learning were selected. Special interest was paid to research based on higher education. Research papers that discussed students, teachers, and online classrooms were considered. This stage helped establish the relevance of the chosen studies. It also enhanced the literature review.

The review was also conducted under inclusion and exclusion criteria. The analysis was limited to peer-reviewed research articles. There was consistency in the choice of studies published in English. The studies addressed online learning settings. Research on students' experiences and teachers' views was also taken into account. Articles that spoke about technological issues in online learning were factored in. But irrelevant articles, such as those not related to education, were not considered. Opinion articles and non-academic reports were excluded, too. This would save the academic quality of the review. It also highlighted that the review was based on reliable research. The articles were analyzed after the appropriate studies were identified. All studies were reviewed to determine their research focus. Imperative themes and findings were noted during the review. A comparison of studies was conducted to identify similar trends in the literature. The most important challenges and opportunities in online learning have also been observed. Methods of research used in past studies were also reviewed.

REVIEW OF EXISTING LITERATURE ON ONLINE LEARNING IN PAKISTAN

One of the recurring themes in research on online learning is student perception. Many studies have investigated how students experience digital learning environments. These studies examine satisfaction, attitudes, motivation, and engagement. Understanding student perception is one way to assess the effectiveness of online learning. Positive perceptions often contribute to successful learning outcomes. Negative perceptions can reduce participation and motivation. Students' views about online learning. In Pakistan, several investigations focus on students' views of online learning. Most of the research has focused on the COVID-19 pandemic. The abrupt shift to digital learning has shaped how many students have experienced learning. These research studies provide valuable insights into how students respond to online education.

Ansar et al. (2021) examined undergraduate students' perceptions of online learning in Pakistan. Their study aimed to mimic student satisfaction during the COVID-19 pandemic. The researchers have discovered varied reactions among students. Many students widely embraced online learning due to the necessity imposed by the crisis. Students valued how education continued during lockdown. Nevertheless, overall satisfaction was moderate (not highly positive). A considerable number of students complained about the problems with internet connectivity and internet interaction. Other students reported a reduction in their activities in online classes. All of these were factors that made them skeptical of online learning systems.

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The analysis demonstrates that students were aware of the significance of online studying, but they also struggled with it.

Similarly, Umbreen et al. (2021) analysed nursing students' perceptions of web-based learning. They used a nursing college in Lahore as the study area. Online learning was easy and convenient for many students. Students said online classes save travel time. Speedy access to information on online education was also important to them. Nevertheless, the conventional classroom learning was liked by many participants. Students believed that the face-to-face instructions enhanced their perception of the course material. The internet connection was also sluggish, thus frustrating the online lectures. Technical issues disrupted learning activities in most cases. It is interesting to note that students who were online have found internet learning useful, but only partially.

Rehman (2021) explored students' online learning experiences when using information technologies. The research has examined issues experienced by learners during remote learning. In certain instances, students had good experiences with digital tools. They enjoyed being able to watch lectures at home. Some students also valued recorded lectures and digital materials. Nevertheless, a certain number of structural problems are also evident in the study. There were many problems with the electricity shortage and internet connectivity among students. The rural and less privileged regions were more affected by these issues. Students in remote areas reported greater hurdles in learning. The research shows that perception is frequently contingent on the availability of technology.

Anjum et al. (2022) researched the psychological effects of online classes. This research offers a different way of looking at students' perceptions. Online learning affected both the mental and emotional experiences of the students. A lot of students reported experiencing increased stress and anxiety, particularly during the process of learning online. Prolonged screen time was also the cause of low concentration and fatigue. Many students experienced social isolation during distance learning. Students lacked interaction with teachers and other students in the classroom. These were the psychological factors that affected students' assessments of online learning. Some students equated online learning with stress rather than academic improvement. This study suggests that perception is affected by emotional health.

Tabassum et al. (2022) reviewed the problems experienced by students in online learning systems. Their research focused on higher education institutions in Pakistan. Students reported several technical barriers while attending online classes. Internet connectivity was the most prevalent problem. Many students also did not have proper digital devices. These barriers affected students' participation in online lectures. Students also expressed trouble in communicating with teachers on the Internet. Limited interaction limited the learning experience of many participants. These challenges affected the student's attitude about online learning systems. The study reveals that technology is a major determinant of students' perceptions.

More recent studies also focus on student attitudes about digital learning. Majeed et al., 2023. University students' perceptions of e-learning in Pakistan. Their findings show that students in general recognize the usefulness of online learning. Many students agreed that digital platforms are beneficial for bringing educational resources closer. Students also liked the flexibility of the learning schedule. However, issues related to the quality of learning remained prevalent. Some students thought that online classes decreased academic interaction. Others claimed to be struggling to keep their concentration during online lectures. These findings support the consensus that student perceptions are mixed. Online learning offers many benefits, yet there are concerns about its effectiveness.

Shah et al. (2023) conducted a study with the technology acceptance model. This model explains how users accept new technologies. According to their study, perceived usefulness

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strongly influenced students' acceptance. There was a more positive attitude among students, where online education improved learning activities. Their perception was also caused by ease of use. If platforms were not complex, students were more inclined to use them. Institutional support also influences students' acceptance of online learning. Students felt more assured when they received training and guidance in universities. This study has shown that technology and institutional support have power in perception.

The latest studies also focus on implementing online learning technologies. Raza et al. (2024) focused on students' perceptions of the technology adoption model. They discovered that perceived usefulness was a considerable predictor of online learning. Students enjoyed digital tools, which made them learn more easily. The availability of course materials was also a positive factor affecting perceptions. Nevertheless, there are those students who prefer the old-fashioned classroom communication. Teaching through face-to-face was felt to be more interactive. Such findings underscore the need for a balance between digital and traditional teaching methodologies. It is thus possible that blended learning can address most of the students' concerns.

The other article by Shabeer et al. (2024) has examined the use of institutional support. Their study was based on learning content and digital competence. Good computer students are perceived more favorably. Such students could adjust to online learning platforms. Student confidence in the digital learning systems also increased due to institutional support. The universities that provided training made students use online platforms well. Based on these results, one might assume that perception is, to some extent, conditional on digital literacy. Difficulty levels are lower in technologically competent students.

The recent research by Saboor et al. (2025) investigated the influence of certain factors on students' acceptance of online learning technologies. Their research was done in institutions of higher learning in Khyber Pakhtunkhwa. The researchers discovered that the availability of technology had a high impact on perception. Students with good internet connectivity were more positive. Students were also willing to embrace online learning due to its perceived usefulness. Nonetheless, the issue of interaction and engagement is still intact, as in the study. It was found that online classes reduced the interaction with teachers among many students. This is where students were not satisfied with the online learning systems.

Overall, several common patterns emerge in their studies of student perceptions. First, there is the importance that students recognize in online learning in emergencies. Online learning allowed education to continue during the pandemic. Many students appreciated the flexibility and convenience of digital learning platforms. Online learners need to understand the characteristics of an online environment, including relationships, interactions, perspectives, and the roles of instructors and students. Students should recognize the instructor's role as a guide or facilitator. When teaching involves helping, directing, and structuring learning, learners may expect "instruction" and believe that the instructor is not actually teaching. Furthermore, technological barriers significantly influenced students' perceptions. Problems with internet connectivity, electrical supply, and access to devices impacted many learners, especially in rural and underdeveloped areas where these issues were more severe. Additionally, interaction and engagement remain key concerns in online learning. Many students feel that classroom interaction plays a vital role in boosting understanding and motivation.

Contemporary educational systems are undergoing significant transformation toward digital environments. As living conditions change, continuous learning is essential. While online learning shifts education frameworks, it also offers new lifelong learning opportunities. Consequently, it is of paramount importance to examine and emphasize the rapidly advancing online tools associated with educational opportunities, as online education facilitates the

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implementation of the lifelong learning paradigm. The biggest issue in Pakistani online learning is the technological setbacks. Technology has become the biggest challenge to digital education, according to many researchers. Needs a good internet connection and suitable digital equipment to work online. Students also require a reliable electricity supply and access to learning platforms. Learning is difficult when these resources are restricted. Several scholars consider such technological barriers in Pakistan. Their conclusions indicate that there were certain serious infrastructure problems. Students and teachers confront these problems. There is a need to know these challenges to enhance online learning systems.

Adnan and Anwar (2020) studied students' perceptions of online learning during the pandemic. Their research revealed that many students faced technological obstacles. Participants were also known to have issues with internet connectivity. Most students reside in regions with poor internet connections. Some students use mobile data to take online courses. Internet access via mobile was always slow and costly. Students had difficulty attending live lectures. These issues affected their participation in the learning. The research demonstrates that internet access is a significant factor in online learning.

Farooq et al. (2020) explored the challenges faced in online medical education in Pakistan. Their studies were on medical students and teachers. The study found various technological limitations. Many of the students lived in places where they didn't have reliable internet access. Some students also did not have appropriate digital devices. Online learning platforms have occasionally crashed during lectures. These were interruptions that interfered with the teaching process. Teachers also experienced technical difficulties during online sessions. The study concluded that infrastructure problems become an obstacle to the functionality of online learning.

Mukhtar et al. (2020) researched the advantages and disadvantages of online learning in Pakistan. During their study, they identified several technological limitations. A serious problem was also detected: internet connectivity issues. The students were forced to deal with interferences in online lectures. There were also learning platforms that were unstable even at peak usage levels. Technological issues were frustrating for both students and teachers. It was also established that a good number of the teachers were not conversant with digital tools. This was a technological issue that influenced the value of online instruction. These findings imply that there is room to improve in technological preparedness.

Ullah et al. (2021) dwelled upon the digital divide in Pakistan. They conducted a study on inequalities in internet access. Among urban students, the Internet was often more widely used. Students in rural areas had more technological problems. In most rural areas, there were no effective broadband services. Other students relied on communal gadgets at the family level. This reduced their ability to attend online classes on a regular basis to a minimum. Such inequalities led to unequal education. The study indicates that the digital divide plays an important role in internet-based education.

The article by Shahzad et al. (2021) investigates the outcomes of online learning among higher education students. They also identified technology barriers in their study. Many students reported being unable to cope with online learning platforms. The poor internet connection hampered their participation in lectures. Students also reported the problem with downloading the course material. Some students were unable to attend classes due to connectivity issues. There were learning inefficiencies caused by these technological obstacles. The research also established that male and female students differed in terms of access. These disparities indicate broader issues of digital inequality.

The online learning experience of Pakistani students is examined by Iqbal et al. (2022). Their study involved academic performance in the process of digital learning. The research revealed that technological issues influenced student outcomes. The internet's instability diminished

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students' capacity to complete academic assignments. Certain students found it challenging to deliver assignments within the stipulated time. Technical problems were also encountered during online examinations. Learners feared severed links in examinations. These issues contributed to students' stress. The research demonstrates that technological issues can affect learning and testing.

The study by Noor and Isa (2023) focused on online learning issues in secondary schools. According to their study, a large proportion of the students were not connected to digital devices. Other students were using smartphones rather than computers. Reading and writing were a strain on small screens. Families are also strained financially by the Internet expenses. In other situations, data limitations prevented students from attending them. Issues with online lesson giving have also been experienced among teachers. Such problems influenced the quality of education among several students.

Khan (2024) examined the history of e-learning platform development in Pakistan. The research concentrated on some infrastructure constraints. There are still many institutions that are not well-equipped with modern technology for digital learning. Internet services remain spotty across the nation. Certain institutions of higher learning cannot sustain consistent learning platforms. In some institutions, technical support services are also scarce. The technical often gives students little assistance with the technical problems. These are the factors that cast doubt on online learning systems. The paper highlights the necessity of developing superior digital infrastructure.

Overall, these studies show that certain technological issues are common. Issues with internet connectivity are manifested in almost all research. Lack of internet access is one of the problems many students experience due to slow or unstable connections. Another problem is the availability of digital devices. Some students lack laptops or computers for online learning. Some areas are also affected by power outages, which impede learning. All of these pose significant obstacles for students and teachers. Online education is, thus, aided by technological issues. Another matter that cannot be overlooked is the digital divide between urban and rural regions. There is greater access to the internet among students living in urban areas. Students in the rural areas tend to be linked, and those are less frequent. This disparity influences the attendance at online classes. Students with better access to technology also have a higher chance of learning. Less-accessible people might be academically lagging. Educational fairness is an issue posed by this digital inequality. One should therefore discuss the digital divide and its implications for the future of digital education, a critical concern.

Online learning is also affected by students' attitudes towards technological issues. A lack of technology will result in frustration and a loss of interest among children. The lectures and discussions are interrupted by poor connectivity. Teachers may fail to make significant explanations to students. Technical difficulties also diminish communication between the students and instructors. This may harm students' motivation and participation. Consequently, technology issues affect both the learning process and academic performance.

Online learning can therefore be successful only after the technological infrastructure is improved. There is a need for governments and institutions to invest in better internet services. The learning management systems should also be strengthened at universities. Teachers can be taught to make good use of digital tools through technical training programs. Learning devices should also be affordable to the students. Electricity and wide-band connection services should also be reliable. Technologies that facilitate online learning can be improved to address IT limitations.

Online learning in Pakistan still faces significant technological challenges. There are connectivity issues with the internet and digital devices among many students. Both teaching and learning activities are susceptible to infrastructure limitations. The digital divide also

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creates imbalances in learning opportunities. These issues highlight the need for better technological support systems. The challenges can be addressed to improve online learning performance. Future research also concentrates on technological solutions for digital education. The implementation of sustainable online learning in Pakistan will be strengthened through improved infrastructure.

Teachers must also understand the significance of creating a helpful online learning community. Establishing a feeling of community among remote learning groups is important. To exchange and expand their knowledge and experience, online learners must work together. Learning can be improved, and motivation can be given by inspiring, praising, and supporting other members of the learning community. In this regard, teacher preparedness plays a significant role in the success of online learning. Online instruction design and delivery involve teacher contributions. E-learning requires additional technological and teaching skills. Educational workers are forced to employ digital and communication technologies, such as online assessment systems. Without being prepared, online learning might not be effective. One can find a considerable number of studies about teacher preparedness in Pakistan. These studies are associated with online competencies, education, and teaching experience. They also cover the problems teachers face when they are asked to teach in online settings. Teacher readiness is thus pivotal to enhancing online education.

Abid et al. (2021) conducted the interviews with teachers regarding their experiences with the abrupt transition to online teaching. They had researched pedagogy versus technology. Most of the teachers did not have much experience with online teaching platforms. The pandemic prompted teachers to become acquainted with digital materials. Such a sudden change gave rise to some problems. Other teachers were not comfortable with learning management systems. Others found it difficult to use the online platform to interact with students. Despite such challenges, several teachers have gradually learned digital skills for teaching. The research shows that teachers' willingness increased with practice.

Tariq et al. (2021) reported on a study of online teaching in Pakistani university practice. In their research, they found that many teachers were reluctant to use online programs in their early teaching. Teachers were at ease with traditional teaching tools. Nevertheless, they were not quite prepared for digital learning. Too many teachers need training in using video conferencing tools. There was also a need to guide teachers in designing online assessments. Most instructors were new to these skills. The analysis demonstrates that professional training programs are required. It is possible to use such programs to increase teachers' digital competence.

Asghar et al. (2021) studied the readiness of pre-service teachers in Pakistan towards technology. Pre-service teachers shape the future of the education system. The future of online education is therefore valuable considering its preparedness. The research found that pre-service teachers were not afraid to use mobile technologies, unlike many others. They, however, were not experienced in using technology in teaching. They could employ digital tools in a social rather than a pedagogical way. This loophole, then, suggests the significance of teacher education programs. The institutions that train teachers have to include digital pedagogy in their curricula. This will prepare teachers for the future in relation to the Internet-based learning environment.

Nadeem et al. (2022) studied the perceptions of university teachers towards e-teaching. Their research established that online learning generally received teacher support. The problem is that digital learning platforms could enhance the conditions, according to many teachers. But some practical challenges were also reported by teachers. Other educators were not properly trained to teach online. Some other people were having problems preparing the course materials in digital form. The difficulties were also caused by technical issues in online classes. The

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institutions should have provided more support to the teachers. This finding indicates the need to provide institutional support for teachers.

In a study by Siddaqqah et al. (2023), the authors examined teachers' preparedness for online teaching practices. Digital competence, as discussed in their paper, has been significant in making online teaching a success. Teachers who were more adept and knowledgeable with ICT were more confident in online teaching. These educators felt more comfortable with digital learning platforms. They were also better placed to deal with online classes. The study implies that ICT training increases teacher preparedness. Skills in digital teaching can thus be developed through professional development programs.

Another article by Akbar and Raza (2023) focused on teachers' willingness to work with a virtual learning environment. Their findings show that teachers' attitudes towards it influence technology adoption. Teachers who have a positive attitude towards online learning will be more inclined to use digital tools. Teacher readiness is also enhanced by institutional support. Colleges that provide training and technical support enable teachers to adjust more quickly. With support systems in place, teachers are more confident. These results identify the relevance of the institutional policies. The policies facilitate teachers' use of digital teaching methods.

Ali and Zafar (2024) discussed ICT among educators in Pakistan. Their study was designed to address digital literacy among educators. The research study has found that a significant number of teachers possess basic knowledge of ICT. Nevertheless, there are no high-level digital instruction competencies. There are those teachers who use technology in communication. Interactive learning practices are also not widely used by them through technology. This absence is a consideration in delivering online teaching. The paper continues to recommend that teacher training programs address pragmatic aspects of digital skills. Educators need schools to provide training on creating online learning environments.

Khan et al. (2024) examined school teachers' interest in online teaching. They conducted their study with teachers and school administrators. This study presented many technical difficulties to many teachers. They were also facing challenges of Internet connectivity that influenced online teaching. The teachers have also noted the lack of access to digital content. Certain schools lacked sufficient technological facilities. Irrespective of such difficulties, educators were highly committed to lifelong learning. This is because many teachers went ahead to learn digital tools themselves. Their work helped ensure teaching continued during the pandemic.

All these studies indicate trends in teacher readiness. To begin with, most teachers were teaching electronically for the first time. The sudden transition to online learning had several challenges. The educators were forced to acquire new technological devices with haste. Time and institutional reinforcements were required to do so. Second, interests in digital competence are a strong factor in defining teachers' preparedness. Good ICT teachers find it more convenient to transition to online teaching. Thirdly, training programs are designed to promote digital teaching. Professional development aims to help teachers become confident with digital tools.

To summarize, teachers' willingness is a key to the success of online learning in Pakistan. A large number of teachers had difficulties in transitioning to digital teaching. Digital competence, however, was developed step by step through experience and training, depending on the teachers. The primary portion of this process is the professional development programs. There are also other advantages of institutional support in enhancing teachers' confidence and teaching. The quality of online learning will, in its turn, be enhanced by reinforcing teacher training. Further research is expected to be carried out in the context of the long-term digital development of teachers. This will aid the development of sustainable education in Pakistan by incorporating online systems.

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Institutional support and infrastructure are necessary to make online learning a success. Online education requires high-quality technological arrangements and administrative plans. Universities must make learning management systems, internet access, and technical support available. Without such resources, online learning is not possible in any sense. Institutional policies also affect the implementation of digital learning. Many studies have examined the role of institutions in supporting online education in Pakistan. These studies show advances and shortcomings. Understanding institutional readiness helps evaluate the sustainability of online learning. It also helps identify the areas where improvement is required.

Ali and Zafar (2024) studied the ICT knowledge and digital education development in Pakistan. Their study dealt with institutional support for technology integration. The research found that many institutions are gradually improving their digital infrastructure. Universities are investing in learning management systems and digital platforms. Some institutions are even offering blended learning courses. However, infrastructural development remains variable across institutions. Some universities still lack advanced digital learning platforms. The study implies that long-term planning is needed for digital transformation.

Khan (2024) analyzed the development of the e-learning platforms in Pakistan. The study revealed the opportunity, as well as those institutional challenges. Some universities are seriously developing digital learning systems. These institutions invest in developing the platforms and provide technical support. However, other institutions are still relying on temporary solutions. A lack of infrastructure development often limits people. Institutional policies also differ from one university to another. These differences impact the quality of the online education. The study highlights the significance of strategic planning in digital education.

A study by Saboor et al. (2025) examined the adoption of online learning technologies in Pakistani Universities. Their study revealed the need for institutional infrastructure. Students were more likely to accept online learning when the institutions had sound technological systems. Reliable learning platforms boosted students' belief in online learning. Institutional training programs were also beneficial in enhancing students' digital skills. The study found that institutional support increases acceptance of online learning technologies. Universities that invest in infrastructure provide better learning environments. Overall, these studies show several patterns regarding institutional support. Many institutions were unprepared for online learning before the pandemic. The sudden transition brought weaknesses in the digital infrastructure to light. Learning management systems were not widely used at many universities. Technical training for teachers and students was also low. These challenges affected the effectiveness of online education. Institutional readiness, therefore, plays an important role in the success of digital learning.

Investment in the infrastructure is also needed for sustainable online learning. Universities should create good learning management systems. Technical support services should be made available for teachers and students. Institutions should also offer training in digital teaching methods. These endeavours will reinforce online learning environments. Governments and education authorities should also support the development of the digital infrastructure. Institutional support and infrastructure play a central role in online learning in Pakistan. Many institutions struggled during the sudden transition to digital education. Hard-to-access infrastructure and training affected online teaching and learning. However, of late, there has been a growing investment in digital education systems. Improving institutional support will yield greater quality online learning. Future research should examine the impact of institutional policies on the long-term development of digital education. Improving infrastructure will be critical to online learning in Pakistan.

CONCLUSION

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Although investigations into online learning in Pakistan have increased in recent years, several gaps remain in the literature. Most existing studies focus on the massive transition to online learning during the COVID-19 pandemic. These studies are principally concerned with short-term experiences of both students and teachers. However, there is limited research on the long-term development of online learning systems in Pakistan. Online learning is now becoming a permanent part of the education process. Therefore, further research is required to understand its long-term effectiveness better. Future research should focus on learning that continues online after emergencies. Longitudinal research would be useful to analyze changes in attitudes and learning outcomes over time. Understanding how these changes can help improve digital education policies.

Another key gap concerns the focus of existing research. As we can see, very few studies focus on students' perceptions of online learning. These studies provide useful information about student satisfaction and challenges. However, fewer studies focus in detail on teachers' experiences. Teachers are an important part of designing and implementing online instruction. The effect of their pedagogical strategies is powerful on the student learning outcomes. Research on teachers' digital competence and teaching methods remains limited. More studies should examine how teachers structure effective online learning activities. Future research should also examine teachers' professional development in digital pedagogy.

Digital equity constitutes a significant facet within the existing literature. While online education may serve as a means to enhance access to educational opportunities, it also has the potential to generate new challenges and inequalities. Little access to digital devices may affect students from low-income families. The rural communities might lack access to the internet. Inequalities may influence online learning. Policymakers must therefore consider digital inclusion when developing education strategies. The inequalities can be mitigated by bringing faculty and students together on a single platform and ensuring equal access to the internet and digital devices. Governmental support programs could assist disadvantaged students.

This research paper was done through a literature review on online learning in Pakistan. The review focused on four themes. These themes were student perceptions, technology, teacher preparedness, and institutional support. It has been suggested in the literature that online learning yields numerous benefits. Education can be made more flexible by allowing students to access learning materials from any place. Thanks to digital platforms, students have the flexibility to plan their studies around their lives. Online teaching is also critical for facilitating the smooth running of education in times of emergency. All these benefits point to the wondrous opportunities of digital learning to revolutionize education in Pakistan.

Nonetheless, challenges in implementing online learning have also been raised in the literature. The most common issues are technological barriers. There are numerous students with internet connectivity glitches. There is also limited access to digital devices amongst some students. Online classes can be curtailed in many parts of the world due to electricity shortages. Such issues influence student interactions on the online learning platform. They also render digital-based teaching methods less effective. Online education, therefore, requires improvements to its technological infrastructure to be successful.

Some research gaps were also determined in the literature review. Numerous short-term studies were undertaken during the pandemic. There is still limited research on long-term studies on online learning. There are also many gaps in research on teachers' digital teaching strategies. The policies and leadership within the institutions have not been examined. Additional research should be conducted on the digital disparity between rural and urban students. These areas should be discussed by future research. These gaps can be identified and addressed to enhance knowledge of online learning in Pakistan. Researching the effectiveness of online teaching methods is another direction for future study. Numerous works investigate perceptions and

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issues. Nevertheless, few of the studies analyze real learning outcomes. The authors of the research must examine the impact of online learning on academic performance. Online and traditional learning would be useful in comparative studies. These studies can help teachers find effective teaching strategies. Evidence-based research can inform educational planning and policy.

In conclusion, online learning has great potential for transforming education in Pakistan. In the existing literature, there are opportunities and challenges in digital learning systems as well. Addressing technological, pedagogical, and institutional barriers is critical. Improving infrastructure and teacher training will build online education. Further research is needed to delve further into digital learning practices in Pakistan. With proper planning and support, online learning can become a sustainable part of the education system.

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