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Navigating the Digital Divide: Exploring Satisfaction of Students with E-Learning during COVID-19 Pandemic at a Peripheral Public University in Pakistan

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Abstract
The COVID-19 pandemic has significantly impacted higher education globally and triggered a rapid shift towards e-learning in higher learning institutions. The rapid shift posed significant challenges for developing countries like Pakistan, which has already been facing existing educational challenges. The purpose of this study was to examine the satisfaction of students with e-learning and to explore the challenges have been faced by students in adapting to e-learning during the COVID-19 pandemic, in a Pakistani peripheral public university context. Employing a quantitative research approach, a questionnaire was self-administered through Google Forms. 151 well-filled and completed questionnaires were used for analysis. The study's findings suggested that students generally experienced learning at a satisfactory level and reported high satisfaction relatively with e-learning during the pandemic. However, the findings also revealed that numerous factors affected the students' satisfaction such as the quality of e-learning materials, and teacher support, limited access to technology, poor internet connectivity, and electricity shortage. The findings of the study suggest that universities should improve their e-learning infrastructure and provide training for teachers to enhance students' satisfaction with e-learning. These measures will contribute to an enhanced e-learning experience and greater student satisfaction in similar crises in the future.

Keywords: COVID-19 pandemic; Students' satisfaction; E-learning; Peripheral public university

Introduction

The COVID-19 pandemic, first identified in Wuhan, China in late 2019, rapidly spread and caused significant loss of life. The virus, officially named COVID-19 by World Health Organizations and Chinese scientists, infected over 1.8 million people by December 16, 2019. As of March 29, 2020, the virus had resulted in over 33 million deaths in 177 countries (WHO, 2020). This global health crisis resulted in widespread restrictions on social and educational activities, including higher education institutions (Shahzad et al., 2021; Shereen et al., 2020; Chahrour et al., 2020). Prior to the pandemic spread, students were taught in conventional, and in-person settings. However, as the virus spread and governments implemented emergency measures, the shift to e-learning became necessary to keep teaching and learning activities continued (Chirinda et al., 2021). This sudden change in pedagogical strategies was a dramatic challenge for students, teachers, and institutions around the world (Chirinda et al., 2022).

The COVID-19 pandemic has caused HEIs worldwide to rapidly transition to e-learning to ensure uninterrupted academic progress. Digital technologies have played an important role in facilitating online classes during the pandemic (Huang et al., 2019). Consequently, worldwide, many HEIs have adopted digital pedagogy to meet academic needs and students' demands, implemented digital pedagogical strategies to achieve curricular objectives, and improve the teaching-learning environment (Gewin, 2020; Wajdi et al., 2020). However, students from developing countries like China and Singapore were more acquainted with online classes than those from developing countries like Pakistan. Many universities had not previously employed digital pedagogical strategies hastily adapted and offered online classes to maintain social distancing (Imran et al., 2020).

The implementation of digital pedagogical strategies in developing countries has been hindered by poor internet access and lack of resources. The online mode of instruction has not been as effective as it could be due to limited internet access for reading and completing educational tasks (Zhang et al., 2020). Additionally, international students have faced challenges with travel restrictions, hands-on curriculum activities, and practical-based learning approaches. Higher education institutions have globally adopted different strategies to address these challenges (Sahu, 2020). Due to social restrictions to combat the

pandemic, students have also reported feelings of fear, anxiety, and discrimination which have affected their participation in traditional classes and social activities. In response to these challenges, several countries have provided protocols to help learners overcome their depression, and HEIs around the world have adopted different strategies to continue educating students during the pandemic (Zhai, and Du, 2020). However, a large number of universities students have expressed satisfaction with the strategies adopted by HEIs to facilitate e-learning since the outbreak of COVID-19, but the overall academic achievement of students was not reliable due to the oppression and mental stress caused by the pandemic (Zhang et al., 2020; Zhai, and Du, 2020; Gupta et al., 2020).

The use of online digital assessment methods for students was greatly affected by a lack of understanding and technical proficiency for educational tasks. This created challenges for both students participating in assessments and universities administering unbiased online exams (Li et al., 2020). Many higher education institutions implemented online instructional strategies but encountered challenges in effectively assessing students' performance. The assessment was limited and hindered by gaps in internet connectivity and a lack of teacher training for online classes, resulting in inadequate evaluation (Sahu, 2020). The potential of e-learning was hindered by a lack of technical resources in Pakistan, placing it at a disadvantage compared to other developing countries: China, India, Malaysia, and Singapore. For example, Adnan and Anwar (2020) found that students had not been satisfied with e-learning during COVID-19 and the majority preferred face-to-face learning. However, another research study found that students have had positive perceptions of e-learning during the pandemic. The study revealed that e-learning had positively been accepted in Pakistan (Farooq et al., 2020). The study concluded that e-learning could have been a feasible alternative to conventional learning during the pandemic. Therefore, the purpose of this study was to examine the satisfaction of students with e-learning and online resources had been provided by faculty during the COVID-19 pandemic at a Pakistani peripheral public university. The following research questions were developed to guide the study:

1. *What was the satisfaction of students with e-learning during the COVID-19 pandemic at a Pakistani peripheral public university?*
2. *What were the students' perceptions regarding the quality and accessibility of online resources provided by teachers and the university for e-learning during the COVID-19 pandemic at a Pakistani peripheral public university?*
3. *What were the challenges faced by students in adapting to e-learning during the COVID-19 pandemic, in a Pakistani peripheral public university context?*

Review of the Literature

The outbreak of COVID-19 has caused a sense of fear and uncertainty worldwide, as its symptoms include cough, fever, fatigue, and taste or smell loss (WHO 2020; Wang et al., 2020; Scull et al., 2020; Lechien et al., 2020). Furthermore, the pandemic has caused depression among HE students in countries such as Bangladesh, India, Pakistan, and Turkey, with anxiety rates reaching as high as 63.6% (Sarker et al., 2020). This has led to students losing opportunities for learning due to stress and anxiety (Guo et al., 2020).

In response to the pandemic, HEIs around the world have adopted digital education (Fawns, 2019) using information and communication technologies (ICTs) to continue teaching and learning activities. For instance, Canadian universities have implemented e-learning instead of traditional classes to control the spread of the virus (Firang, 2020). However, HEIs have faced challenges in transitioning from face-to-face to e-learning in many countries worldwide (Abumalloh et al., 2021; Shu, 2020; Khan et al., 2020). In China, institutions such as the University of Xiangya Hospital of Central South University, Peking Union Medical College Hospital, and West China Hospital of Sichuan University have successfully implemented online classes to control the spread of the virus (Hua & Shaw 2020). The teacher education department in Hong Kong closed institutions and highly preferred online classes in 2019-2020 (Moorhouse, 2020). Similarly, Australian universities moved to digital learning platforms to prevent the spread of the virus (Li, & Lalani, 2020). The United Arab Emirates has also adopted e-learning in response to the spread of COVID-19. the Hamdan Bin Mohammed Smart University leading the way as the first fully digital university in the country. The university has shared its virtual experiences with other institutions to help them transition from in-person to online classes during the pandemic (Awofeso and Rabih, 2022).

The Bocconi University in Milan, a private institution, successfully implemented online classes to continue academic programs for its 9,000 students during the COVID-19 pandemic. In addition, Singapore's Minister of Higher Education encouraged students to pursue online learning options during the pandemic. Philippine HEIs also embraced e-learning, but staffs were not fully satisfied with the digital pedagogical implementation. Universities in Uzbekistan faced challenges and gaps in technology operations during the

shift to online classes (Khusanov et al., 2022)
On March 13th, 2020, in response to the COVID-19 pandemic, the Pakistan Higher Education Commission (HEC) directed educational institutions to shift from traditional classes to e-learning. However, despite this shift, students have reported dissatisfaction with e-learning. Kazimi et al. (2020) found that 77.08% of students in Pakistan were dissatisfied with e-learning. Safdar and Khan (2020) found that students have had different views on e-learning facilities, resources, and content delivery at various universities in Punjab. In addition, a study of medical and dental colleges by Ansar et al. (2020) found that the majority of students preferred face-to-face learning over e-learning. The findings demonstrate that most students were not satisfied with the e-learning facilities and resources during the pandemic and their satisfaction with e-learning was a complicated issue that varied depending on factors including the quality of online resources, content delivery, and lacking internet access in Pakistani peripheral areas.
Several studies found that students were not satisfied with the new paradigm of e-learning (Watermeyer et al., 2020) despite the efforts to adopt e-learning. The rapid shift from face-to-face to online classes has left students confused about how to engage with curricular activities (Yan et al., 2021). To address this, numerous programs have been launched to support affected students and create suitable online learning platforms for them (Scull et al., 2020). Additionally, systematic approaches have been established for online classes to effectively utilize technologies and meet the students' needs (Shohel et al., 2022). However, the adoption of online curricular activities remained unsustainable due to a lack of practice (Mukhtar et al., 2020; Bao, 2020).
Similarly, Li et al. (2020) found that student's formative and summative assessment by online digital approach was highly affected due to unawareness of technological operation for educational tasks. Therefore, assessment procedures developed challenges for students to get involved in the assessment and for universities to conduct unbiased online semester exams. Similarly, Sahu (2020) highlighted that many Higher Education Institutions (HEIs) completed courses with online instructional strategies, but the assessment procedures fell into tremendous challenges for faculties and administrations to assess students' performance to acquire reliable results.
Furthermore, Adnan and Anwar (2020) demonstrated that students in Pakistan were not satisfied with e-learning during the COVID-19 pandemic. He found that most of the students preferred face-to-face learning over e-learning. Moreover, a study on 382 MBBS and BDS students from a medical college conducted by Abbasi et al., (2020) found that students in Pakistan confronted challenges like a lack of technical resources, a lack of teacher training, and limited internet connectivity, which hindered their ability to adapt to e-learning. However, not all the studies have found negative results, some studies have shown that many students across different disciplines prefer e-learning during the pandemic (Harvard University and Oregon University, 2020). found that e-learning was positively accepted by students. They concluded that e-learning could be a viable alternative to traditional classroom learning during the COVID-19 pandemic (Rajabiian et al., 2023).
The extensive existing previous literature indicates that the satisfaction of students with e-learning is multifaceted during the COVID-19 pandemic and could be influenced by different factors, including online resources quality, access to the internet, and demographic and socio-economic status of students. Despite this fact, some studies demonstrated that students have positively perceived e-learning during the pandemic, and thus, limited studies have been done in Pakistani universities, particularly in a peripheral context.

Research Methods

Research Design
Employing a quantitative research approach with descriptive statistical techniques, the purpose of this study was to examine the satisfaction of students with e-learning during the COVID-19 pandemic at a Pakistani peripheral public university. According to Sugiyono (2015), a quantitative research approach is based on the philosophy of positivism and was used to study a particular population or sample, collecting data through a research questionnaire, and analysis. The study used a descriptive research design to describe the phenomenon and its characteristics (Gall et al., 2007). To thoroughly examine students' satisfaction with online classes during COVID-19, the study employed a close-ended questionnaire (Radha et al., 2020). The study focused only on undergraduate students who participated in online classes during the COVID-19 lockdown. The researchers developed a questionnaire consisting of 49 questions using a four-point Likert Scale to examine satisfaction of students with e-learning. The scale included 'Very Satisfactory (V.S)', 'Satisfactory (S)', 'Neutral (N)', and 'Not Satisfactory (N.S)'. The questionnaire consisted of four sections to explore students' perception regarding satisfaction with e-learning in terms of the abrupt adoption of online classes, teachers' content delivery, resources for content and self-study, assessment and evaluation

of student performance, and university administration support and supervision of online classes.

Research Design

The study participants were limited to undergraduate students who experienced e-learning during the COVID-19 pandemic at a peripheral public university in Pakistan. The students were sampled from different faculties and disciplines within the university. Table 1 presents the demographic characteristics of participants, including their gender, age, and faculty. Table 1 shows that the majority of participants were male (75.5%) while the rest were female (24.5%). The questionnaire was distributed among undergraduate students using Google Forms through WhatsApp.

Table 1. *Demographic Characteristics of Participants*

Demographics	Frequency	Percentage
Gender		
Male	113	74.8 %
Female	38	25.2%
Age		
21-23	117	77.5 %
24-26	32	21.2 %
27-29	2	1.3 %
Faculty		
Language & Literature	12	7.9 %
Education	43	28.5%
ICT/Computer & Engineering	3	2.0%
Agriculture	25	16.6%
Marine sciences	11	7.3%
Veterinary	20	13.2%
Social sciences	36	23.8%

Data Collection Procedures and Analysis

The data collection process was affected by the widespread transmission of COVID-19. The researcher utilized digital platforms to distribute the questionnaires, sending links via WhatsApp to 200 students using Google Forms. Out of 200 students, 163 questionnaires were received, and only 151 well-filled and completed questionnaires were used for the analysis.

Data were analyzed with SPSS (version 20), in terms of frequency and percentage. The reliability and validity of the data were also assessed to ensure that the results obtained were accurate and trustworthy as well as what was intended to gauge whether that was gauged.

Table 1 shows the demographic information of the participants. It includes information on gender, age, and faculty. The sample size is 151 participants, out of which 74.8% were male and 25.2% were female. In terms of age, most of the participants (77.5%) were between the ages of 21-23, followed by 21.2% between 24-26, and only 1.3% between 27-29. The participants in the study represented a range of different faculties/departments including Education (28.5%), Social Sciences (23.8%), Agriculture (16.6%), Veterinary (13.2%), ICT/Computer & Engineering (2.0%), Marine Sciences (7.3%), and Language & Literature (7.9%) respectively.

Results

Table 2 shows the results of the student's views on content delivery. The results of the study show that 16.6% of respondents were very satisfied, 37.7% were satisfied, 23.2% were neutral, and 22.5% reported dissatisfaction with online content delivery. Regarding e-learning instructions, 6.6% of respondents were very satisfied, 30.5% were satisfied, 29.8% were neutral, and 41.1% were not satisfied. This indicates that most respondents were dissatisfied with online instructions, and many also faced problems in understanding the online instructional methodology of the digital shift of classes.

The results of the study also showed varying responses to different aspects of online learning. For instance, where 7.9% of respondents were very satisfied, 25.2% were satisfied, 35.8% were neutral, and 31.1% were not satisfied. Few students had a neutral response regarding the smooth continuity of online classes. Results showed a positive outlook on digital content presentation, with 12.6% of respondents being very satisfied, 48% being satisfied, 24.7% being neutral, and 17.9% not satisfied. The results indicate that some respondents were satisfied with the digital content presentation. Regarding online subject material provision, 15.9% were very satisfied, 42% were satisfied, 16.6% were neutral, and 24.5% were not satisfied.

The majority of participants found the online study material delivery easy to access and acceptable since online classes started.

As shown in Table 2, 16.6% of respondents were very satisfied with the implementation of an online methodology for different subjects, with 35.1% being satisfied, 25.8% being neutral, and 21.9% being dissatisfied. Most respondents accepted the modification of instructional methodologies to the digital mode and the adoption of a new teaching-learning context. The reliability of newly arranged online classes was responded to positively by 10.6% of respondents, with 37.7% being satisfied, 26.5% being neutral, and 25.2% being not satisfied. With the comprehensiveness of online learning and the accessibility of intangible activities provided by teachers, the majority of students were satisfied. However, the study showed dissatisfaction among students regarding online learning collaboration and different subjects' delivery online. Regarding motivation and guidance by instructors during online classes received a mixed response, with 27.2% being very satisfied, 33.1% being satisfied, 16.6% being neutral, and 22.5% being not satisfied.

Table 2. *Students' perceptions regarding online content delivery*

Statements	**Very Satisfied**	**Satisfied**	**Neutral**	**Not Satisfied**
The E-learning approach was (1)	25 (16.6%)	57 (37.7%)	35 (23.2%)	34 (22.5%)
Teaching methods for content online (2)	10 (6.6%)	46 (30.5%)	33 (21.9%)	62 (41.1%)
Sequential online lecture delivery (3)	12 (7.9 %)	38 (25.2%)	54 (35.8%)	47 (31.1%)
E-learning content presented by teachers (4)	19 (12.6%)	68 (48%)	37 (24.7%)	27 (17.9%)
Subject material delivery in online classes was (5)	24 (15.9%)	64 (42%)	25 (16.6%)	37 (24.5 %)
Enough raw materials in the soft form provided by teachers were (6)	34 (22.5%)	49 (32.5%)	37 (24.5%)	3 (19.9%)
Online teaching method applied by teachers for certain subjects was (7)	25 (16.6%)	53 (35.1%)	39 (25.8%)	33 (21.9%)
Online teaching method by teachers was understandable (8)	22 (13.2%)	57 (37.7%)	41 (27.2%)	33 (21.9%)
Delivery of courses was reliable rather than conventional classes (9)	16 (10.6%)	57 (37.7%)	40 (26.5%)	38 (25.2%)
The E-learning approach was comprehensive (10)	17 (11.3%)	56 (37.1%)	45 (29.8%)	32 (21.2%)
The e-learning approach was cooperative and collaborative learning as face-to-face (11)	29 (19.2%)	43 (28.5%)	27 (17.9%)	51 (33.6%)
All subjects of courses had the same learning frequencies (12)	16 (10.6%)	44 (29.1%)	39 (25.8%)	52 (34.4%)
Teachers motivated and guided students about e-learning (13)	41 (27.2%)	50 (33.1%)	25 (16.6%)	34 (22.5%)
Enough intangible activities were provided by teachers (14)	20 (13.2%)	51 (33.8%)	36 (23.8%)	44 (29.1%)
The nature of subjects could meet the e-learning approaches (15)	16 (11.9%)	52 (34.2%)	34 (22.5%)	47 (31.1%)
The e-learning platform was a two-way communication approach (16)	20 (18.5%)	65 (43.0%)	33 (21.9%)	33 (21.9%)
The nature of e-learning was a teacher-cantered (17)	28 (18.5%)	66 (43.7%)	28 (18.5%)	29 (19.2%)
E-learning content was student-cantered (18)	12 (7.9%)	50 (33.1%)	35 (23.2%)	53 (35.1%)

Table 2 also shows that 11.9% of respondents reported being very satisfied with the nature of the online learning approach, 34.2% were satisfied, 22.5% were neutral, and 31.1% were not satisfied. Despite this, the majority of students expressed positive views on online access to different subjects. 18.5% reported being very satisfied with two-way online communication, with 43.0% being satisfied, 21.9% neutral, and 21.9% unsatisfied. However, many students were satisfied with digital learning, and educators believe that

student-centered learning is more productive than teacher centered. 18.5% of respondents were very satisfied with the teacher-centered approach, 18.5% were satisfied, 43.7% were neutral, and 19.2% were not satisfied. Student-centered learning activities are highly favored and considered effective in teaching and learning, with 12% of respondents being very satisfied with online student-centered content delivery, 33.1% being satisfied, 23.2% neutral, and 35.1% not satisfied. This implies that online content delivery was teacher-centered rather than student-centered.

Table 3. *Students' perceptions regarding resources for content and self-Study*

Statement	Very Satisfied	Satisfied	Neutral	Not Satisfied
Enough resources were provided to students for online classes (19)	36 (23.8%)	42 (27.8%)	24 (15.9%)	47 (31.1%)
Students access online class materials (20)	20 (13.2%)	56 (37.1%)	35 (23.2%)	40 (26.5%)
Satisfy to deal with online classes (21)	24 (15.9%)	47 (31.1%)	26 (17.2%)	54 (35.8%)
Satisfied to invest minor in online classes (22)	20 (13.2%)	37 (24.3%)	44 (29.1%)	50 (33.1%)
Enough level of performance boosted confidence while e-learning (23)	16 (10.6%)	50 (33.1%)	35 (23.2%)	50 (33.1%)
Enough discussion with your classmates on online classes (24)	22 (14.6%)	46 (30.5%)	12 (13.9%)	59 (39.1%)
Had enough resources for e-learning (25)	25 (16.6%)	41 (27.2%)	28 (18.5%)	57 (37.7%)
Had a satisfactory condition with a good internet connection to meet e-learning (26)	23 (15.2%)	39 (25.8%)	30 (19.9%)	57 (37.7%)
Requirements and accomplishment of the e-course were clearly outlined (27)	22 (14.6%)	48 (31.8%)	37 (24.5%)	44 (29.1%)
Had online personal interaction with other students during the course (28)	17 (11.3%)	43 (28.5%)	35 (23.2%)	56 (37.1%)
Students' engagement in curricular activities was satisfactory (29)	17 (11.3%)	38 (25.2%)	38 (25.2%)	57 (37.7%)
More motivation and level of performance with e-learning (30)	22 (14.6%)	43 (28.5%)	29 (19.2%)	56 (37.1%)
Active and productive engagement with online classes (31)	28 (18.5%)	49 (32.5%)	34(22.5%)	40 (26.5%)
The e-learning approach provided opportunities for career establishment (32)	33 (21.9%)	34 (22.5%)	41 (27.2%)	43 (28.5%)
Had utilized multiple opportunities when online classes were addressed (33)	14 (9.3%)	51 (33.8%)	31 (20.5%)	54 (35.8%)
E-learning had satisfactory management of time, energy, and money (34)	27 (17.9%)	48 (31.8%)	27 (17.9%)	49 (32.5%)

Table 3 shows statements related to the provision of online resources and content for students' self-study. As shown in Table 3, around 23.8% of respondents were very satisfied with the resources provided for online learning, while 27.8% were satisfied, 15.9% were neutral, and the majority, 31.1%, were dissatisfied with the resources provided for online learning. Suggesting that a major proportion of respondents were dissatisfied with the provision of resources for online classes.

In terms of access to online study materials, 13.2% of respondents were very satisfied with quick access, while 37.1% were satisfied, 23.2% were neutral, and 26.5% were not satisfied. The results show that soft materials were easy to access in online classes. Regarding students' satisfaction with e-classes, 15.9% of respondents were very satisfied, 31.1% were satisfied, 17.2% were neutral, and the majority, 35.8%, were dissatisfied with the statement. Similarly, regarding the minor investment needed to access online classes, 13.2% of respondents were very satisfied, 24.3% were satisfied, 29.1% were neutral, and the majority, 33.1%, were not satisfied.

The study results also indicated that 10.6% of students responded very satisfied with e-learning boosting their performance and confidence, while 33.1% were satisfied, 23.2% were neutral, and the majority, 33.1%, were dissatisfied. The study showed that discussion in online classes was not considered satisfactory, with 14.6% of respondents very satisfied, 30.5% satisfied, 13.9% neutral, and the majority,

39.1%, dissatisfied with the digital classes' discussion. The results showed that the majority of respondents, 37.7%, were dissatisfied with basic resources for online classes that were not easily accessible. In terms of a good internet connection for online classes, 15.2% of participants were very satisfied, 25.8% were satisfied, 19.9% were neutral, and the majority, 37.7%, were not satisfied. Most of the students, 31.8%, were satisfied with the outlined directives for accomplishing online courses, while 14.6% were very satisfied, 24.5% were neutral, and 29.1% were dissatisfied.

As shown in Table 3, 14.6% of the respondents were very satisfied with their interaction with other students during online classes, while 28.5% were satisfied, 24.5% were neutral, and 37.1% were not satisfied. This indicates a challenge in terms of poor personal interaction in online classes. The results also showed that regarding students' engagement in online curricular activities, 11.3% were very satisfied, 25.2% were satisfied, 25.2% were neutral, and the majority 37.7% were dissatisfied. Suggesting that the majority of the respondents were found to be dissatisfied with online curricular practices. Furthermore, regarding students' motivation for performance in online classes, Table 3 shows that 14.6% were very satisfied, 28.5% were satisfied, 19.2% were neutral, and the majority 37.1% were dissatisfied. This shows students' dissatisfaction with online instructional motivation. On the other hand, 18.5% of the respondents were very satisfied with their active and productive performance in online classes, while 32.5% were satisfied, 22.5% were neutral, and 26.5% were not satisfied. Indicating that the majority were satisfied with their active involvement in online classes.

Table 3 illustrates the views of students on the impact of e-learning on their careers, where 21.9% reported being very satisfied, 22.5% were satisfied, 27.2% had a neutral perspective, and the majority, 28.5%, were dissatisfied. Regarding the multi-use opportunities offered by online classes, 9.3% of respondents were very satisfied, 9.3% were satisfied, 20.5% had a neutral view, while the majority, 35.8%, reported dissatisfaction. This highlights that the majority of respondents were dissatisfied with the multi-use opportunities in online classes. Concerning the impact of e-classes on students' time, energy, and money, 17.9% were very satisfied, 31.8% were satisfied, 17.9% were neutral, and the majority, 32.5%, were dissatisfied. This indicates widespread dissatisfaction among students regarding online class opportunities.

Table 4. *Students' perceptions regarding e-assessment and evaluation*

Statement	**Very Satisfied**	**Satisfied**	**Neutral**	**Not Satisfied**
Formative assessment was measured in e-learning (35)	26 (17.2%)	46 (30.5%)	42 (27.8%)	36 (23.8%)
Satisfied with summative assessment (36)	31 (20.5%)	49 (32.5%)	39 (25.8%)	32 (21.2%)
Question sessions accommodated in online classes (37)	35 (23.2%)	54 (35.8%)	27 (17.9%)	35 (23.2%)
The response was given by teachers during online classes (38)	40 (26.5%)	59 (39.1%)	26 (17.2%)	26 (17.2%)
Teachers suggested activities while evaluating the feedback and performance (39)	26 (17.2%)	56 (37.1%)	31 (20.5%)	38 (25.2%)
The learning outcome of online classes was productive and satisfactory (40)	16 (10.6%)	61 (40.4)	34 (22.5%)	40 (26.5%)
Teachers and faculty investigated problems related to achievements in online classes (41)	27 (17.9%)	52 (34.4%)	24 (15.9%)	48 (31.8%)

As shown in Table 4 regarding the assessment and evaluation of student's performance during the pandemic. 17.2% of the respondents showed high satisfaction with the online formative assessment, while 30.5% were satisfied, 27.8% were neutral, and 23.8% were dissatisfied. The results suggest that there is little satisfaction with the online formative assessment. Similarly, 20.5% of the respondents were very satisfied with the summative assessment, the majority (32.5%) were satisfied, 25.8% had a neutral attitude, and 21.2% were dissatisfied. Implying that the systematic procedure of summative assessment was to some extent received well by the students. Furthermore, 23.2% of the respondents showed high satisfaction with the question-answering during online classes, while 35.8% were satisfied, 17.9% were neutral, and 24.1% were dissatisfied.

Table 4 shows that nearly 26.5% of the respondents demonstrated satisfaction with the teachers' responses during online classes, while 39.1% were satisfied, 17.2% were neutral, and 17.2% were not satisfied. 37.1% of the students were highly satisfied with the teachers' suggestions for further activities after the evaluation. In terms of learning outcomes of online class productivity, 10.6% of the respondents were very satisfied,

40.4% were satisfied, 22.5% were neutral, and 26.5% were not satisfied. Finally, 17.9% of respondents were very satisfied with the staff and faculty for their problem-solving abilities and achievements in online classes, while the majority of 34.4% were satisfied, 15.9% were neutral, and 31.8% were not satisfied with the supervision provided by the teachers.

Table 5 illustrates the results related to the university administration's support and supervision of online classes. About 13.9% of respondents were very satisfied with the institutional organization of e-learning courses, while the majority, 39.7%, were satisfied. 15.2% were neutral, and 31.1% were not satisfied. This suggests a positive response to the institutional arrangement of e-learning courses. However, the majority of respondents, 39.7%, were dissatisfied with the e-learning facilities provided by the university. 12.6% were very satisfied, 28.5% were satisfied, and 19.2% were neutral. This shows that most respondents were dissatisfied with the university's provision of facilities.

Table 5. *Students' perceptions regarding administration support and supervision*

Statement	**Very Satisfied**	**Satisfied**	**Neutral**	**Not Satisfied**
Satisfied with the organization of e-learning courses (42)	21 (13.9%)	60 (39.7%)	23 (15.2%)	47 (31.1%)
The university provided enough e-learning facilities (43)	19 (12.6%)	43 (28.5%)	29 (19.2%)	60 (39.7%)
Administration played a vital role in students' guidance in the new learning platform (44)	23 (15.2%)	63 (41.2%)	28 (18.5%)	37 (24.5%)
University provided a clear direction for e-learning (45)	27 (17.9%)	59 (39.1%)	28 (18.5%)	37 (24.5%)
It was a challenge for the university to address such a learning platform for the first time (46)	47 (31.1%)	53 (35.1%)	34 (22.5%)	17 (11.3%)
University administration timely covered the courses as possible (47)	20 (13.2%)	48 (31.8%)	41 (27.2%)	42 (27.8%)
An understandable software application was introduced for online classes by the administration (48)	32 (21.2%)	64 (42.4%)	23 (15.2%)	32 (21.2%)
Had access to administration to convey problems for solution-related online classes (49)	22 (14.6%)	37 (24.5%)	37 (24.5%)	55 (36.4%)

In terms of the administration's role in students' guidance on the newly adopted platform, 15.2% of participants were very satisfied, 41.2% were satisfied, 18.5% were neutral, and 24.5% were not satisfied. This indicates that many respondents had a positive response to the administration's role in guidance for online classes. For the provision of clear directives regarding online classes, 17.9% were very satisfied, 39.1% were satisfied, 18.5% were neutral, and 24.5% were not satisfied. This shows that the administration attempted to encourage students with clear directives about online classes.

Table 5 shows students' views regarding institutions to addressing online classes for the first time was a challenge. 31.1% of participants were very satisfied, 35.1% majority were satisfied, 22.5% were neutral, and 11.3% were not satisfied. Suggesting that it was complicated for universities to adopt digital learning mode. Regarding timely completion of courses, nearly 13.2% of participants were very satisfied, 31.8% majority were satisfied, 27.2% were neutral, and 27.8% were dissatisfied. Moreover, 21.2% of participants were very satisfied with understanding software and applications for online classes, 42.4% majority were satisfied, 15.2% were neutral, and 21.2% were not satisfied. The result indicates that addressed software applications were more comfortable to use. Moreover, from enough accessibility of students to the administration to solve problems of online classes, 14.6% were very satisfied, 24.5% were satisfied, and 24.5% were neutral, however, the majority 36.4% were dissatisfied regarding solving problems of online classes. Consequently, it suggests that the majority of respondents were of the view that was difficult to approach the administration to convey the complications and weaknesses of online classes.

Discussion and Implications

The COVID-19 pandemic significantly impacted higher education and triggered a rapid shift towards e-learning in higher education institutions (HEIs) worldwide. Many HEIs adopted online pedagogical strategies to prevent the COVID-19 pandemic from spreading, maintain social distancing and achieve curricular objectives and keep teaching and learning activities continued (Wajdi et al., 2020; Gewin, 2020; Moorhouse, 2020; Li & Lalani, 2020). The rapid shift towards e-learning was particularly challenging for developing countries like Pakistan, where there have already been existing educational challenges. The

purpose of this study was to examine the satisfaction of students with e-learning during the COVID-19 pandemic, at a Pakistani university, particularly in a peripheral context. The study's findings suggested that students generally experienced learning at a satisfactory level and reported high satisfaction relatively with e-learning during the pandemic. However, the findings also revealed that numerous factors affected the students' satisfaction such as the quality of e-learning materials, and teacher support, limited access to technology, poor internet connectivity, and electricity shortage. The study suggests that universities need to improve their e-learning infrastructure and training for teachers to enhance students' satisfaction with the e-learning experience and also ensure the provision of reliable and efficient technological infrastructure to support effective e-learning (Kazimi et al., 2020; Mahyoob, 2020).

The study revealed that a significant proportion of respondents reported dissatisfaction with online instructions. The majority of students found the online study material delivery easy to access and acceptable. However, there was dissatisfaction among students regarding online learning collaboration and different subject delivery online. In addition, the study showed that the majority of respondents reported dissatisfaction with the provision of resources for online classes. While some aspects of e-learning were positively perceived by students, many areas require improvement to ensure satisfactory e-learning experiences for students during the pandemic and beyond.

The study findings also showed that most of the students reported that teaching methods for online content were comfortable because the online instructional methodology applied by teachers for certain subjects was satisfactory, in line with the findings of the study conducted by Safdar and Khan (2020) and Farooq et al. (2020) in Pakistan found that students have had different views on e-learning content delivery at various universities in the province of Sindh. In addition, they concluded that the e-learning content delivery and instructional methodology were positively accepted by students and that could be a viable alternative to traditional classroom learning during the pandemic. Suggesting that systematic approaches should be established for online classes to effectively utilize technologies and meet students' needs (DeLisi et al., 2020).

The findings implied that a significant portion of student respondents viewed the e-learning platform as not a two-way communication approach that was teacher-centered, consistent with the findings of the previous studies conducted in the province of Punjab, Pakistan found that students were dissatisfied with e-learning, which significant portion preferred face-to-face learning (Adnan and Anwar, 2020). Ansar et al. (2020) found that the majority of students preferred face-to-face learning over e-learning. Furthermore, the findings demonstrated that most students were not satisfied with the e-learning facilities and resources during the pandemic and their satisfaction with e-learning was a complicated issue that varied depending on factors including the quality of online resources, content delivery, and internet connectivity issues ad access, lack of teacher training, and maintaining students' engagement in Pakistani peripheral areas. Collaboration with stakeholders, institutional support, utilizing free online training resources, and innovative thinking overcome these challenges (Farooq et al., 2020).

The study also found that most respondents were dissatisfied with e-learning to provide career opportunities and engagement in curricular activities in line with the findings of the study by Ansar et al. (2020) conducted at a medical and dental college where most of the students were dissatisfied with existing resources for self-study and practical activities provided by their institutions for curricular activities. In addition, the study found that students demonstrated their dissatisfaction with online formative and summative assessments in line with the findings of past studies which revealed that a higher proportion of respondents were dissatisfied with online formative and summative assessments and highly affected by poor internet connections and the unwariness of technological operation (Farooq et al., 2020; Xiao et al., 2020; Li et al., 2020). Therefore, assessment procedures created challenges for students to be involved with it, and for universities to conduct unbiased online semester examinations. Similarly, Sahu (2020) concluded that many HEIs completed their courses online, but the assessment procedures had tremendous challenges for faculties and administrations to assess and evaluate students' performance online to acquire reliable results.

The analysis of this study also revealed that a major portion of students was satisfied with the role of administration in their guidance in the new learning platform and timely completion of the courses possible. Moreover, the students responded that having access to the administration to convey problems for solution-related online classes is in line with the previous research (Oliveira et al., 2020) that provided satisfactory online academic programs and introduced an understandable software application for online classes by the administration and management (Firang, 2020; Hua and Shaw, 2020).

The current study contributed to digital pedagogical research by expanding the stock of existing literature on students' satisfaction with e-learning and exploring the challenges confronted by students in adapting to e-learning during the COVID-19 pandemic, particularly in the context of a peripheral public university in

Pakistan. The study's findings have implications for university and government authorities, as well as policymakers in Pakistan in particular and other developing countries in general. In addition, e-learning has undoubtedly emerged as an essential tool for continuous learning and could be an effective alternative to traditional face-to-face learning during pandemics and emergencies. However, it requires careful consideration of the diverse needs and preferences of students. To make e-learning productive, university administration should invest in digital literacy skills and provide high-quality e-learning resources to students that effectively support learning outcomes. Universities should also emphasize prioritizing course content and instructor support are essential to guarantee a positive and effective e-learning experience for students. Additionally, the study highlighted the challenges students faced accessing technology and e-learning resources in less developed regions. Therefore, it is recommended that government authorities and policymakers should prioritize investment in digital infrastructure and ensure equitable access to technology and resources for e-learning during similar crises in the future.

Limitations of the Study

Despite its valuable contribution, the study is not without limitations. However, the limitations provide the readers with the opportunity to determine the usefulness of the study (Marshall and Rossman, 2011). The main limitation of the study is its narrow scope because it only focused on undergraduate students with a relatively small sample size of 151 students at a peripheral public university in Pakistan. This limits the generalizability of the findings to other contexts and universities. Furthermore, the study used a close-ended questionnaire to collect data, which limits the depth and richness of the data; mixed methods research could have provided a nuanced understanding of the participants' experiences and satisfaction with e-learning during the pandemic. Finally, this study only captured a snapshot of students' satisfaction with e-learning during the pandemic and has not investigated the effectiveness of e-learning and compared it with face-to-face learning.

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