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Challenges of Online Learning in Developing Country under the Impact of the Pandemic Situation- A Case Study of Pakistan

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ABSTRACT

On the 30th of January 2020, The WHO proclaimed COVID-19 as a Public Health Emergency of International concern. As a direct response to COVID-19, on the 14th of March 2020, the Pakistani government decided to close all educational institutions and directed Higher educational institutions in Pakistan to begin distance learning (DL) modes and to assist their students online regularly until the COVID-19 crisis is resolved. The objective of this study is to identify the challenges that Pakistani students faced while participating in online learning environments and (1) determine whether or not there are any differences between male and female students and different socioeconomic statuses of the students who faced challenges during online learning; (2) highlighted whether online education is still feasible in Pakistan or not. The research was carried out with their permission and was conducted using an analytical and cross-sectional study. The survey was collected from 550 students through Google forms. The sampling technique used in this study was random sampling. The results of the independent sample t-test indicated that there was a difference between the responses of male and female students regarding challenges encountered in online education. Online learning cannot produce positive results in developing countries like Pakistan, where a large majority of students do not have access to a reliable internet facility due to financial and technical problems. Educational institutions that provide online courses or programs need to incentivize their teaching staff to reimagine traditional lecture-based classes for delivery in an online setting.

Keywords: Online Education, KMO and Bartlett's test, t-test, random sampling, COVID-19.

1. INTRODUCTION

On the 30th of January 2020, The WHO proclaimed COVID-19 as a Public Health Emergency of International concern [1]. Due to the escalating prevalence of confirmed cases and the continuous risk of further global spread, COVID-19 was declared a pandemic on the 11th of March 2020. The Federal Health Ministry((FHM) of Pakistan declared the first two cases of COVID-19 in Karachi, respectively [2]. As of the 19th of June in 2020, the COVID-19 cases in the country were 176543, and 4000 people had died as a result of the virus [3]. As a direct response to COVID-19, on the 14th of March 2020, the Pakistani government decided to close all educational institutions [4]. Higher educational institutions in Pakistan have been directed by the Higher Education Commission (HEC) to begin preparing for distance

learning (DL) modes, to reschedule the exams that are currently taking place, and to assist their students online regularly until the COVID-19 crisis is resolved. These directives were issued in accordance with notification given by the FHM [4]. Students participate in a kind of education known as online education by accessing educational content from the comfort of their own homes via the Internet and personal computers. While at the same time, E-learning has emerged as a trend in the education field due to the lack of other available options for educating physically present students in a classroom setting. You can write it as "The COVID-19 pandemic has resulted in a significant increase in the number of deaths, widespread terror, and confusion all around the world. However, online education is not good for the community learner, as they reveal that the course will not complete properly, which has resulted in widespread concerns regarding the contentious issue of online learning and teaching during COVID-19. To address the above information, this research highlights the challenges faced by countries that are not as technologically sophisticated as countries that are endowed with high technology, as well as the opportunities that may be available in such nations [5-11].

The unanticipated shift toward online learning evolved into measuring an organization's adaptability. Many educational institutions concentrated their attention primarily on the transition of educational content to the digital world rather than on online teaching and delivery methods [12]. Nevertheless, it was a reminder of the lack of resources in academic institutions and the social marginalization of students, where inadequate access and availability of the Internet, and the lack of the latest technology affected organizational responsiveness and the students' capacity to participate in digital learning. In addition, it was a reminder of the social marginalization of students [13-14]. Another important issue with E-learning is overcoming the opportunity to communicate effectively with teachers and students. In addition, any questions or complaints regarding the material covered in the online course are often sent to the appropriate course teacher through e-mail, which necessitates a response time [15]. Students who learn best physically will not find virtual classrooms attractive. Traditional classroom socializing is one of the most important aspects that is lacking in online education. Students never meet other students in person and only contact them via digital apps; as a result, the real-time sharing of ideas, information, and knowledge is somewhat lacking in the appearance of digital learning. The current conditions are exceptional; in contrast to typical online learning environments, as some people could argue, online education is being delivered inside Pakistan's university education framework. In Pakistan, educational institutions have been closed down in areas where social distance is more important than in other nations. After observing a decline in the number of students enrolling in educational programs, the government of Pakistan advocated using online education by students to protect both their time and their future. The higher level of education in the country has mostly been the center of attention when it comes to online education. In Pakistan, it should not come as a surprise that a significant number of parents have rebelled against the system. Pakistan now has over 70,000 private schools, which accounts for approximately one-third of all schools. Private funding currently contributes more to Pakistan's educational system than governmental financing does. Pakistan is home to a total of 120 medical colleges, with only 44 of them being public and the remaining 76 being private institutions. In these extraordinary times, online teaching and learning is the only option to solve the academic catastrophe that is occurring around

the world as a result of the epidemic of coronavirus.

However, online education has experienced several avoidable situations in the earlier literature regarding teaching, learning, and assessments. In contrast, E-education has been adopted on a large scale. When evaluating online education, [16] reported that the diversity of practices and how they may be implemented in an online context is severely constrained. The reported data/literature revealed that online classrooms provide a variety of problems that both students and professors have voiced. The students have first participated in an online class, and as a result, it has been discovered that they are having difficulty appropriately adapting to the system. Moreover, learning and instructing will be a new adventure as they transition from traditional classrooms to the more contemporary format of computer-based instruction in a "virtual classroom."

Second, during the lockdown, most students in various regions of the nation have been staying at home. This is because internet facilities are limited in rural areas, so students utilize mobile Internet, which mostly troubleshoots problems with online connectivity. Moreover, the cost of internet access in our nation is still high. Third, specific technological problems exist, such as a lack of computer and smartphone literacy. In addition, both teachers and students are needed to download various software, such as Zoom and Tencent meetings or Google Chat, etc. Sometimes claims difficulty due to less experience and the fact that these applications only possess significantly less time for connection. Fourth, time management is also essential; for example, Zoom can link individuals online for a total of 40 minutes during each session, but it takes students some time to reply to the class because there are often disruptions caused by technology. Students that enter the class aimed at the lesson have less opportunity to comprehend some of the material. Fifth, all teachers have problems giving feedback to each student while keeping students engaged in the subject. According to [17] research, adjusting to the setting of an E-class can be difficult for students and facilitators

Due to the prohibitively expensive Internet connection and easy accessibility of the technology can be acquired, there has been a significant demand for instruction and education delivered over the web. Education offered over the Internet is rapidly becoming more prevalent in school systems and institutions throughout the United States. This study also investigates whether online classes are beneficial for high school students. This study raises issues regarding how high school students engaged in an online course might receive the most helpful support, which was underlined before [18-23].

In [24] proposed a study to explore the perceptions of students in higher education in Pakistan on the required implementation of online and distance learning for university courses during the epidemic of COVID-19. In Pakistan, students of postgraduate and undergraduate levels were polled about their opinions on online education. The study's findings indicate that E-learning cannot generate the intended outcomes in developing nations like Pakistan. This is because a large number of Pakistan's students do not have an internet connection due to a combination of financial constraints and technological barriers. Higher education students have noted various difficulties, including reduced face-to-face involvement with their teachers, slower reaction times, and a lack of traditional classroom socializing.

Another research [24] shows that around 70% of students participated in online education throughout the lockdown time. The majority of students attended their online classes using android-based mobile devices. Students have reported various issues associated with melancholy and anxiety, inadequate internet

access, and an unsuitable atmosphere for studying at home. During this epidemic, students from underserved communities and those living in rural or isolated locations confront the most significant educational obstacles. Based on the findings of this study, focused interventions to promote a favorable environment for learning among students from vulnerable sections of society are suggested. There is an immediate need for strategies that will allow the state to construct a robust education system that will ensure the development of skills necessary for employment and the productivity of young minds.

The main contribution of the study are as follows;

- This study presents the differences between male and female and different socioeconomic status students regarding the challenges encountered when participating in online education.
- To evaluate and analyze the different relations between groups and variables, KMO and Bartlett's, and T-tests are conducted.
- The results indicate a difference between the responses of males and females and different socioeconomic status students regarding challenges encountered in online education. According to the findings, all students, regardless of their educational level (high school, university level, etc.), had the same problems.

In addition, the project aims to find answers to the following hypotheses:

H01 = The students that participate in online learning do not have any difficulties.

H02 = There is not a substantial difference in the reactions of male and female students to the problems that they confront when participating in online education, correct.

H03 = There is not a significant difference in the educational levels of the students' comments on the difficulties that are encountered when participating in online education.

2. METHOD

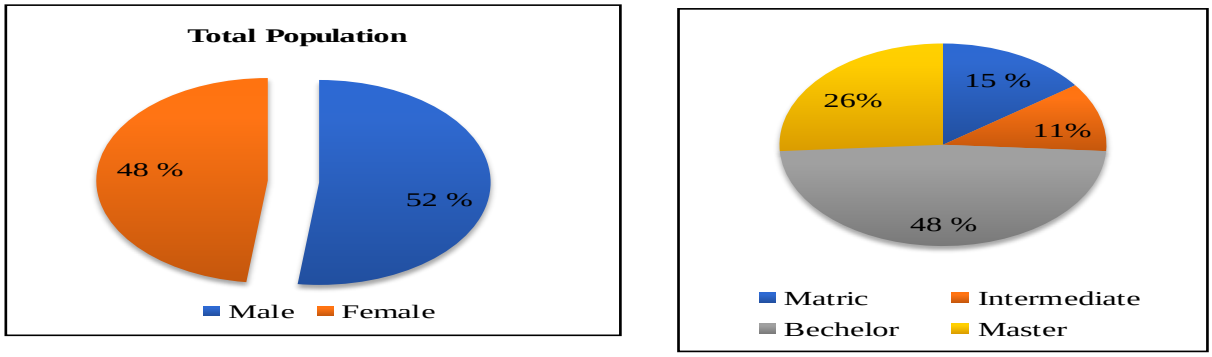
2.1. Research Design

This research used a descriptive research design to collect accurate data. Its approach entails describing research variables and behavior without influencing them. The study used a research survey for the quantitative research methodology. The researchers surveyed a representative sample of the total population to describe the respondents' views, habits, opinions, and traits. Moreover, researchers gather the quantitative data through questionnaires (E-mail and WhatsApp). After doing so, they analyze the data to evaluate the research hypothesis and questions. The survey may be divided into two primary parts: the sample survey census. The survey demonstrates that data can be obtained from every student in the population, excluding anybody from the survey process. The purpose of the study is often summarized using the data obtained from a representative part of the population in a survey sample. The majority of research survey designs are included non-experimental. These designs analyze the statistical connection between variables to characterize a particular variable. Longitudinal surveys collect data from the same target group several times. However, this research design is a cross-sectional survey. Its purpose was to investigate the difficulties in online learning experienced by students registered in E-education courses during the pandemic.

2.2 Sample and Population

The students in Pakistan who were enrolled in online programs were the target of this particular research project at Swabi, Pakistan's educational institution, which provided the source for selecting random samples. Moreover, 550 students were selected from the population. We randomly

picked, and the method is called random sampling. As a method of data collecting, we used an online survey conducted using a Google form. The demographic information of the participants is shown in figure 1.



(a) (b)

Figure 1. Characteristics of the participants (a) (b).

2.3 Instruments

The design and organization of a questionnaire that was self-constructed. The first part was devoted to the respondent's background information. It was broken down into sub-parts such as age, the name of their university or college, their qualification (level of education), gender, and different socioeconomic status selection. The second section discussed the challenges that students have faced in online learning. In this investigation study, a variety of scales were used. i.e., Dichotomous scale, Category scale, and Nominal scale. In order to discover the connections that exist between the various variables, the study made use of the correlation's method for analysis. After that, we examined the dependability of each variable to determine whether the constructs were internally consistent. Participants in the study were students from Swabi, Pakistan, who were enrolled in online courses at the time of the research. There are 550 students in the sample that was collected. The method of sampling used was known as simple random sampling. As a method of data collecting, we used an online survey conducted using a Google form. These statistics showed that the value of reliability was 0.80.

2.4 Data Analysis

The data were analyzed with SPSS 15.0, and the study comprised an assessment of the sample's demographic profile and an investigation of the construct's internal consistency. The participants' responses to the scale's items were presented descriptively, using %ages and frequencies in particular. The t-test and Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's test of Sphericity was then used since the results of the normality test that had been used to compare the groups revealed that the combined data were normally distributed.

3. RESULTS

In this section, descriptive analysis is presented. Furthermore, it also represents relational analyses of the subjective framework. The responses to the various questions raised by the researcher are outlined in Table 1, along with the frequency and %age of respondents for each challenge. These questions pertain to the difficulty encountered by students when participating in online learning. 191 of the 550 respondents, or 34.7%, said yes, while 359 responded no, for an overall response rate of 65.3%. In addition, the second question's 416 (75.6%) of the 550 respondents "yes", while 134 (24.4%)

shows "no". "Compared to laptops and tablets, mobile phones have become one of the most popular devices among students". The 411 of the 550 respondents, or 74.7 %, replied yes, while 139 of the respondents, or 25.3%, indicated "no", while the question "whether or not time management is a challenging issue for online learners". A total of 550 respondents 54.4%, gave a positive response, while 251 of the respondents, or 45.6%, gave a negative response. The question "Do you have any anxiety when attending your lessons online" 357 of the 550 respondents (64.9 %) replied "yes", while 193 of the respondents (35.1 %) replied "no". The question "." Is there any mismanagement experienced by you during online learning?" was asked to 550 people, and 357 (64.9 %) of those people replied yes. The remaining 193 (35.1 %) respondents said "no". 207 (37.6 %) of the respondents to the survey replied yes, whereas 343 (62.4% of the respondents) answered negatively to the question of "whether or not the Pandemic situation boosted students' levels of self-confidence". Out of 550 respondents, 285 (31.6%) responded "yes", while 376 (68.4%) replied "no" to the question of "whether or not online learning improved students' capacity to develop their learning skill.

Table 1. Shows Statistical analysis of participants along with demographic information.

Age (in years):	Education:	Gender:	socioeconomic status:
1. 25 and less than 25	1.Matric & & intermediate	1. Male 2. Female	1. Poor
2. 26 to 30	2. Bachelor		2.Rich
3. 30 to 50	3. Master		

No	Factor involving	Yes	No
1.	Is it beneficial for students to participate in online learning?	416	134
2.	Compared to laptops, tablets and phones have quickly become one of the most popular devices among students for engaging in online educational pursuits.	191	359
3.	Time management is a challenging task for E- learners	411	139
4.	Is there any miss-management faced by you during online learning?	357	193
5.	Have students enhanced their social skills while participating in online learning?	174	376
6.	Do you have any anxiety when attending your lessons online?	468	82
7.	Pandemic circumstances facilitated the development of contemporary evaluation and assessment technology for students?	367	183
8.	Is it true that the online learning method is appropriate for all students given the current pandemic?	82	468
9	Family provided financial support to manage Internet and other computing resources costs during the e-Learning journey.	75	475
10.	In Pakistan, is online learning still applicable?	202	348

From the pool of 550 respondents, 272 (49.5 %) said yes, while 278 (50.5 %) replied "no" to the question, "Is the online learning method valid for all students in its precarious situation?" 468 of the total 550, 85.1 % responded "yes", while 82 (14.9 %) of the respondents answered negatively about whether online studying during a pandemic scenario impacts a student's eyesight. Students' social skills increased due to online learning, according to 269(48.9 %) respondents and 281 (51.1 %) of the respondents, respectively, out of 550 total respondents. 367 of the 550 respondents replied yes, while 183 answered no, to the question of whether or not the Pandemic situation has updated the assessment Technology evaluation for students.487 students responded out of a total of 550. (88.5 %) responded "yes", while 63 (11.5 %) of the students replied "no" to the question, " Family provided financial support to manage internet and other computing resources cost during e-Learning journey."279 of the 550 respondents (50.7%) responded "yes", and 271 of the respondents (49.3%) replied "no". The question of whether online education may be applied further in Pakistan was asked to 550 people, and 202 (36.7 %) of those people replied "yes". The remaining 348 (63.3 %) responded "no," as shown in figure 2.1

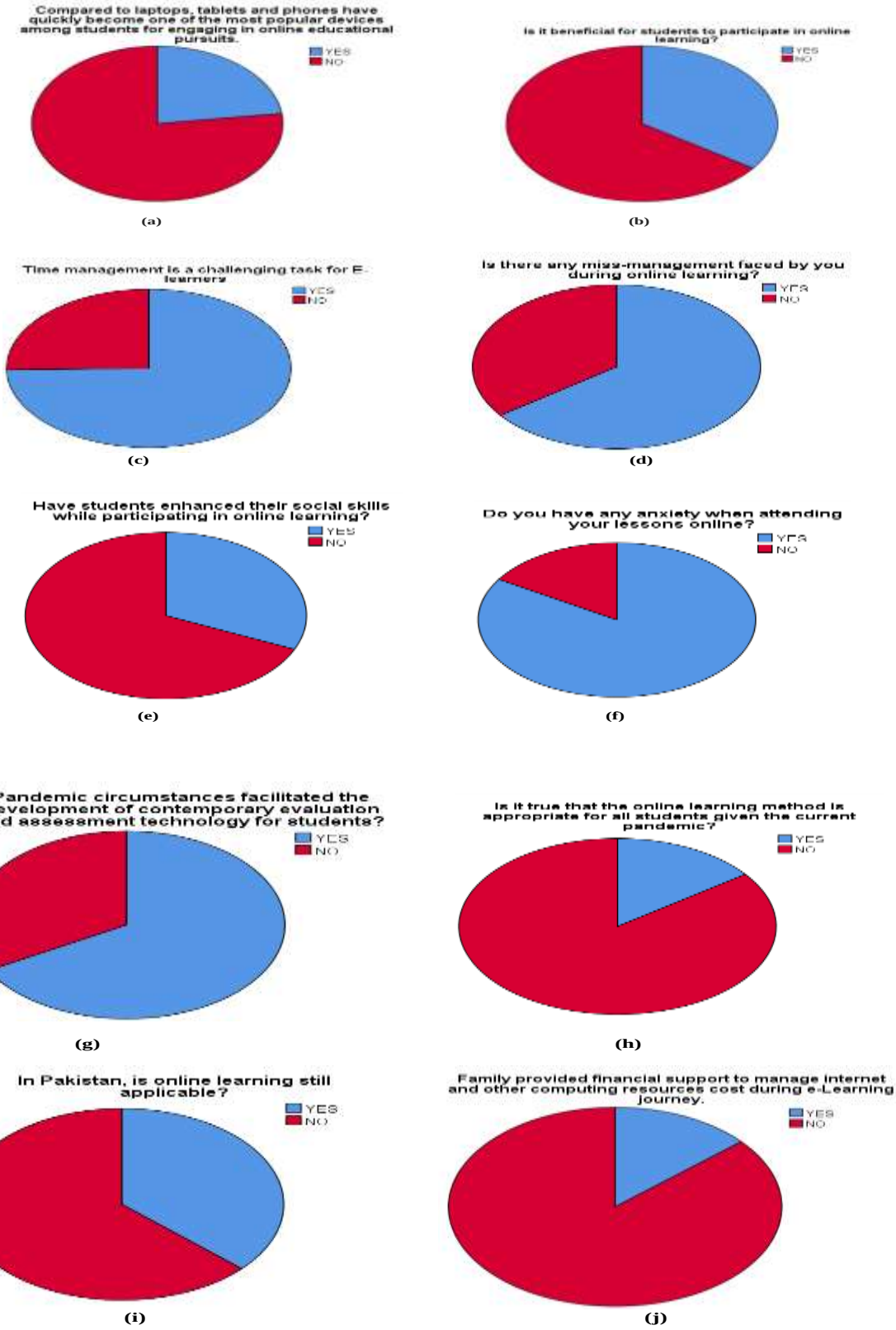


Figure 2.1. The ratio (%) participants response(a-j).

The statistics (mean, std. deviation, min and max, sample size, etc.) and variables are shown in table 2.

Table 2. Shows statistical description of participants along with the response.

Statistics											
	Compared to laptops, tablets and phones have quickly become one of the most popular devices among students for engaging in online educational pursuits.	Is it beneficial for students to participate in online learning?	Time management is a challenging task for E-learners	Is there any miss-management faced by you during online learning?	Have students enhanced their social skills while participating in online learning?	Do you have any anxiety when attending your lessons online?	Pandemic circumstances facilitated the development of contemporary evaluation and assessment technology for students?	Is it true that the online learning method is appropriate for all students given the current pandemic?	In Pakistan, is online learning still applicable?	Education of responded	Family provided financial support to manage Internet and other computing resources cost during e-Learning journey.
N	Values	550	550	550	550	550	550	550	550	550	550	550
	Missing	0	0	0	0	0	0	0	0	0	0	0
Mean	1.7709	1.6527	1.2527	1.3509	1.6836	1.1618	1.3309	1.8509	1.6327	1.7836	1.8636	
Std. Error of Mean	.01794	.02032	.01855	.02037	.01985	.01572	.02008	.01520	.02057	.02986	.01465	
Mode	2.00	2.00	1.00	1.00	2.00	1.00	1.00	2.00	2.00	2.00	2.00	
Std. Deviation	.42063	.47654	.43497	.47769	.46548	.36862	.47097	.35650	.48250	.70032	.34349	
Variance	.177	.227	.189	.228	.217	.136	.222	.127	.233	.490	.118	
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Maximum	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	

KMO and Bartlett's test of Sphericity

The KMO test is carried out to determine the degree to which the variables have a partial correlation with one another. The researcher uses a principal component analysis (PCA) with a varimax rotation to analyze the data to verify the reliability of measures for all items falling under the E-learning challenges construct based on student evaluation.

Analysis of the KMO Value in Relation to Sampling Adequacy 1 to 0.9 Excellent, good between 0.8 and 0.9, a medium between 0.7 and 0.8, reasonable between 0.6 and 0.7, acceptable between 0.5 and 0.6, and unacceptable below 0.5 Furthermore, the KMO value close to 1.0 and the significance value of Bartlett's Test close to 0.0 indicated that the data is adequate. Table 3 shows that Bartlett's Test of Sphericity was significant (Chi-square, p-value (Chi-square, p-value0.000)), and the significance value of Bartlett's Test was close to 0.0.

Table 3. Shows total variance using Principal Component Analysis (PCA).

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	5.577	61.963	61.963	5.577	61.963	61.963
2	1.952	21.688	83.651	1.952	21.688	83.651
3	.581	6.451	90.102			
4	.465	5.162	95.264			
5	.211	2.347	97.611			
6	.074	.828	98.439			
7	.064	.706	99.145			
8	.051	.567	99.712			
9	.026	.288	100.000			

Table 4. Presents the KMO and Bartlett's test.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.853
Bartlett's Test of Sphericity	Approx. Chi-Square	6791.612
	df	36
	Sig.	.000

According to the findings, there is a significant overlap in the information contained within the variables, which points to a robust partial correlation. As a result, carrying out factor analysis is a sensible course of action, as shown in Tables 3 and 4. A statistically significant test (typically less than 0.05) demonstrates that the correlation matrix is not an identity matrix (rejection of the null hypothesis), as shown in figures 3. and 4.

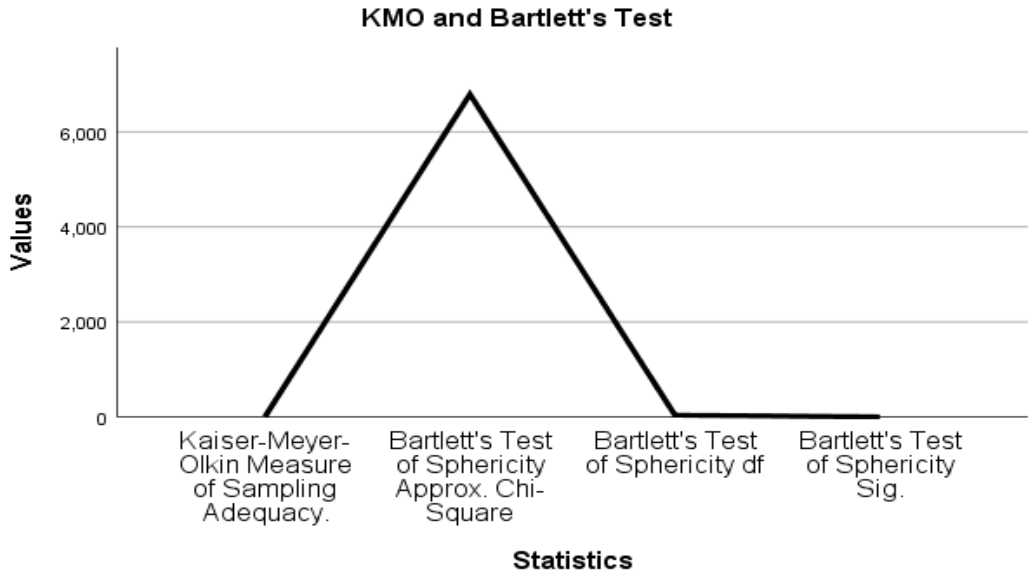


Figure 3. Analysis of KMO and Bartlett's test of Sphericity.

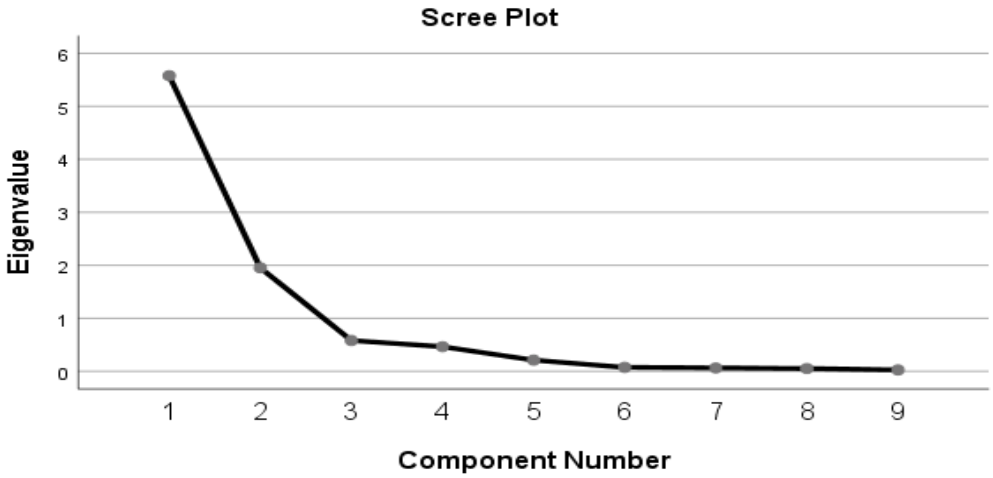


Figure 4. Presents the further analysis of KMO Test and Bartlett's test of Sphericity.

Moreover, one sample of the t-test was applied to determine the challenges students encounter when participating in online learning. Given that the P value of P (0.000) is lower than the level of significance (0.05), we can conclude that our null hypothesis, which stated that "Students in online learning experience no problem," is false. Therefore, it is possible to conclude that students participating in online education are confronted with many challenges. Table 5 provides a summary of the findings concerning the question of whether or not the gender variable contributes to the difficulties that are encountered.

Table 5 One Sample t-test of significant differences between males and females regarding difficulties encountered in online education.

Variables	N	SD	df	t	M	p	Gender
Challenges encountered by students	166	3.7	549	3.80	22.40	0.832	Male
	386			1.89	23.70		Female

Finally, we investigated whether or not there is a correlation between the different socioeconomic status effects on E-learning; we implemented a t-test, as shown in Table.

Table 6. One Sample t-test of significant differences in how students of different socioeconomic status responded to questions concerning difficulties encountered in online education.

	Sig.	Mean Square	Sum of Squares	F	df	p
Within groups		13.53	6841.4	19.79	550	
Between groups	0.0	250.5	750.5		3	
Total		250.5	750.5		3	

Table 6 shows that the F-value of 19.79 with p = 0.000 is statistically significant at the standard alpha level of significance (.05) difference between the various socioeconomic statutes of students' concerning problems while participating in online education. There is a significant gap in different socioeconomic statutes between students' responses concerning the challenges they encounter when participating in online education. Students of poor socioeconomic statutes had more significant difficulties during the pandemic in online classrooms than students of rich socioeconomic statutes. Because due to COVID-19, the avg family member becomes needy and poor, and they cannot afford Internet and computing resources for their children. This shows that poor students have more difficulty with online education than wealthy students.

Therefore, we have to conclude that our hypothesis, which indicated that "There is no substantial difference in the socioeconomic statutes of students' responses on challenges faced during online education," is rejected.

Table 7. One Sample t-test of significant differences in how students of different educational levels responded to questions concerning difficulties encountered in online education.

	Sig	Mean Square	Sum of Square	F	df
Within groups		12.53	6841.4	18.79	546
Between groups	0.0	235.5	706.5		3
Total		235.5	706.5		3

Table 7 explains that the F-value of 18.796 with p = 0.000 is statistically significant at the standard alpha level of significance (.05) difference between the educational level of students' comments concerning problems while participating in online education. There is a large gap also in the educational level between students' responses concerning the challenges they encounter when participating in online education. Students in lower-level courses had more significant difficulties during the pandemic in online classrooms than students in higher-level classes. It is because the lower

education level has unfamiliar with the Internet and computing resources which is much more difficult for him to take online classes during the pandemic. Therefore, we have to conclude that our hypothesis, which indicated that "There is no substantial difference in the educational level of students' responses on challenges faced during online education," is also rejected.

4. DISCUSSION AND RECOMMENDATION

The COVID-19 pandemic influenced the education of students around the world who took classes via physical. Online education was approved by the higher officials of academic institutions so that students may continue their studies. Even though it has the potential to be used with various digital tools such as tablets and smartphones, online learning may not be as productive as expected, according to the findings of some researchers [2-16]. It is the case even though online learning appears to help protect students and faculty's health during the COVID-19 pandemic in developing countries [21]. In underdeveloped nations like Pakistan, India, Nepal, Africa, etc., where many students do not have access to a reliable internet service owing to financial and technological issues, online learning cannot deliver positive outcomes. It is because of the country's current economic situation or students' socioeconomic status. The purpose of this research was to investigate the performance of online education and the challenges encountered by students enrolled in online courses. According to the findings of this investigation study, average 75 % of students lacked access to adequate internet facilities and faced a wide variety of internet-related problems, and 65 % of students lacked satisfaction with online education. 85 % of students responded that attending online courses on smartphones is causing them to have eyesight problems. Whether they were at the high school or the university level, all of the students were dealing with the same problems. Students of all genders who have different socioeconomic statuses were encountering the same difficulties in their online courses.

Most students are concerned about studying in a digital or online environment. Students in Pakistan's higher education system encountered several significant challenges, the most important of which were a lack of access to internet services, appropriate engagement and communication with other students and teachers, and inefficient technology. Students now have an entirely new educational experience as a direct consequence of the abrupt transition away from conventional classrooms and studying face-to-face to online learning. Most students do not have access to dependable or high-speed internet connections, so they are having trouble with online studying. Students in less developed regions of former Fata, Baluchistan, Chitral, and Gilgit-Baltistan do not have access to internet services [22].

During the early days of the web, only a few educational institutions were able to successfully launch online courses because of the restricted resources available to them. According to the study's findings, other difficulties students experience include a shortage of socializing opportunities on campus and slow response time from teachers. Respondents also noted that it is possible that Pakistan may not be able to make use of online courses in the future. Because most of the students in underdeveloped nations, such as Pakistan, do not have access to the Internet due to budgetary and technological constraints, one might conclude that online education cannot provide effective outcomes in these kinds of countries.

Students often participate more actively in academic tasks in conventional classroom settings because of face-to-face contact with the lecturer and their class companions. According to the student's responses, the traditional classroom setting provides a higher motivation level for learning than the alternative, distance learning. Most students can efficiently manage their time to study

online and quickly finish assignments on time. However, whole courses cannot be done online.

Students not only need to have the ability to keep up with the rapid speed of online courses, but they also need to have solid computer and technology abilities to learn from online lectures. It is the only way to ensure that an online program is efficient and successful. Such students can manage their study time effectively.

4.1 Recommendation

Following are some recommendations that were developed based on the study's findings.

- Educational institutions that provide online courses or programs need to incentivize their teaching staff to reimagine traditional lecture-based classes for delivery in an online setting.
- Researchers exploring online teaching and learning should prioritize gathering data regarding the use of tools, systems, and practices for which a sound evidence base is not currently available. Stipends and, mainly, course release time, are potent motivators for faculty. In particular, it would be necessary to have statistics on the services provided by student success management systems. Some examples of these services are course selections and early-alert systems.
- These systems include: The use of technology for training the students will employ in their courses should be actively promoted by academic institutions and academic units. Students will unavoidably use a wide variety of tools and technologies, including those that are publicly accessible (such as Google Drive and Microsoft Office) and others that are exclusive to the university (such as the LMS). Many students have the impression that they are not equipped to utilize the institution's particular technology, and some even have the impression that they are not prepared to use commercial software. Lack of knowledge and confidence is a key cause of failure for students, and it does not matter how many online courses or programs an institution offers or how large those programs are. Technology is essential to the success of students. However, there is a rather simple solution to this problem: The most pressing training requirements of the student body should be determined by the institutions, after which training options in the identified areas should be made available and aggressively promoted. Faculty members must encourage or even require students to attend the training in order to improve students' technological literacy.
- Educational institutions that provide online courses or programs must design incentive systems that promote innovative pedagogical practices to attract and retain students. Innovation in the classroom does not often result in favorable treatment throughout research universities' tenure and promotion procedures. However, it is not always the case. Faculty members with a higher level of self-assurance in their abilities to manage the classroom are more likely to encourage or even require students to use computer devices. At the same time, they are present in the classroom. Its self-assurance develops organically with age and with an increase in the number of years spent working in a teaching post.

Declaration by Authors

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