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Impediments of Online Learning and Teaching During Covid Pandemic: A Case of University Students in Punjab, Pakistan

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ARTICLE DETAILS	ABSTRACT
<p>History:</p> <p>Received: February 10, 2023 Accepted: April 11, 2023</p> <p>Keywords:</p> <p>Covid-19 Online Learning Internet Accessibility Economic cost Institutional Help</p> <p>DOI:</p> <p>10.52700/assap.v4i1.247</p>	<p>Due to COVID-19, online learning has become a major source of imparting knowledge around the world. But for developing countries, such as Pakistan, where only a small fraction have access to the Internet, this is quite challenging. The purpose of the study is, therefore, to examine vulnerabilities among university students across the province of Punjab, Pakistan, which emerged due to sudden changes in Pakistan's education system as a result of the coronavirus outbreak and the implementation of a nationwide lockdown. An online survey was conducted, and a sample of 379 students was selected from three different faculties at the University of Sargodha (Main Campus), which is one of the largest public sector universities in Punjab, Pakistan. The collected data were analyzed using statistical techniques such as percentage, cross tabulation, and multiple linear regression. The findings revealed that load-shedding, high technology costs, poor connectivity, a lack of institutional support, and a lack of face-to-face interaction are significant impediments to students, traditional learning and teaching pedagogy cannot simply apply to online learning and teaching, and that new ways of thinking and doing things are required to develop a new pedagogy that takes into account all of the variables that have been mentioned in the study</p> <p>© 2021 The Authors, Published by WUM. This is an Open Access Article under the Creative Common Attribution Non Commercial 4.0.</p>

1. Introduction

The outbreak of COVID-19 occurred for the first time in Wuhan City, China, in December 2019. The new coronavirus has been recognized as a pandemic and a global crisis by the World Health Organization as this outbreak continues to grow outside of China and reported cases reached 2 million with 8,000 deaths in more than 160 countries (Sohrabi et al. 2020). The virus reached Pakistan on February 26, 2020, when two cases were recorded (Waris et al. 2020). Due to a severe spike in Pakistan's COVID-19 cases, On March 26, Pakistan's Federal Minister for Federal Education & Professional Training, Shafqat Mehmood, announced that all educational institutions would be closed until the situation improved. Pakistan's higher education has asked universities to train staff and immediately develop online courses for students as a response to the situation of COVID-19 in the country, as it is the only possible solution for the safety of faculty and students (Ali 2020). That is why there has been a recent

trend of online learning systems being observed in Pakistan. Pakistan spends hardly 2% of the total GDP on education, which is the lowest compared to other South Asian countries (Ahmed et al. 2014). Previously, it was even below 2%. The data showed that GDP reached 2% in 2012–13. Access to basic and advanced education has been a constant challenge for Pakistan's ability to develop its human capital and transform itself into a knowledge-based economy. The limited budget for education and the reduced investment in infrastructure are further fuelling the situation (Qureshi et al. 2012). The sudden shift from an education system that is already flawed and needs to be modified to a system that requires an abundance of resources and technical expertise has posed several challenges (Khan et al. 2020).

The major problems that students usually face during an online learning environment include an unsuitable environment for study, the disparity in the availability of gadgets, inadequate content for online study, no connection or poor internet speed, and load shedding. Besides, students' health is also reported to be seriously impaired by attending online classes. Weak eyes, being overweight, sleep deprivation, and problems of conduct among students in this lockdown period are found to be higher. It is recommended that there must be a reduction in the timings of an online classes, students training, easy availability of gadgets, and cost-effective internet packs should be introduced to make online courses useful, along with encouraging students (Noor et al. 2020). Another primary concern in students' context is that it is hard for them to focus on screen material as they are accustomed to the methods of paper-based reading, as these methods allow them to make highlights and notes to foster their understanding. There is also the problem of not connecting to the server for a long duration due to low bandwidth and load shedding (Avgeriou et al. 2003).

Online learning is threatening to the university's fundamental structure because it is difficult for institutions to retain their traditional delivery and facilities structure. Universities need to change to accommodate demand and develop such programs that fulfill a broad range of learning requirements. The goal of using technology should be to improve and expand on the learner process rather than to replace it. Slow servers, busy signals, no access, defective hardware, and software configuration are all hurdles that can cause frustration, which ultimately affects the learning process (O'Neill et al. 2004). One more issue that students usually face in an online learning environment is social isolation. In an online learning environment, both the students and the teachers are operating at different times and locations. This is why students cannot communicate face-to-face with their teachers and fellow students, which creates a feeling of being isolated (Hodgekinson et al. 2004).

Students often feel isolated as they feel like taking an online course all by themselves rather than being a part of a learning community in which they can share their opinions and ideas. Some students are technology-driven, while some aren't. During an online course, students expect teachers to be available 24 hours a day and expect instant feedback (Vanhorn et al. 2008). Technical issues are a significant aspect that needs to be addressed for the successful implementation and integration of online learning systems. These issues include load shedding, fast Internet, availability of the latest technology and its installation, maintaining and administering, security, and lack of resources (Panda and Mishra 2005). To support this paradigm shift, universities need to focus on ICT and reliability, tangibility, assurance, and responsiveness. ICT must include, i.e., ease of use, compatibility, and perception. With the aforementioned elements, universities can continue to operate in the situation of COVID-19 in Pakistan (Shehzadi et al. 2020).

The online learning environment creates various genuine moral concerns, including degree program quality, uprightness, security, gatekeeping, privacy, and academic honesty and

supervision. These are the troubling issues that must be addressed (Reamer 2013). Technologically advanced countries have developed systems for online learning, but this is not the case for most low-income countries, like Pakistan. Significant challenges faced by faculty members and students in Pakistan during COVID-19 are lack of faculty training and no institutional support; internet connectivity issues; assessing students online; engaging students; and adequately understanding the different aspects of online education. A collaborative approach is required, including all stakeholders, support, free online training resources, and creative thinking to overcome all these barriers. Teachers, administrators, and policymakers need to convert this disguise of COVID-19 into an opportunity for developing online learning programs. This will allow new avenues for online learning. COVID-19 is a global crisis, so we need to learn our lessons and make the best out of this time and prepare ourselves in a better way for the future (Farooq et al. 2020).

There is this need to develop compensatory behaviors for the relative lack of nonverbal communication. In the pioneering days of online learning, a contemplative design of learning activities is mandatory to attain educational outcomes (Anderson et al. 2001). All novice internet users face socioeconomic as well as psychological issues. New internet users feel uncomfortable while using the Internet, are usually unsatisfied with their skills, and are more likely to experience stress-inducing situations. The Internet requires developing a different set of skills, which is quite daunting to novice users. Prior experience with the Internet is a significant factor in Internet self-efficacy. Providing computers and the Internet would only remove physical barriers to access, but not psychological ones. There is a risk that deficient computer skills will be viewed as a kind of stereotype (Eastin and LaRose 2000). China is one of the most technically advanced countries in the world. However, its social media is still full of anecdotes of resentment towards online education. Students turn off their videos to block out relatives yelling or playing games in the background. It is challenging for students to focus when they are adjacent to home comforts. You don't get the proper response as you get face-to-face. Online education gets weird when students turn off their microphones, leaving teachers to address a black screen for hours (Lau et al. 2020). Students usually ask fewer questions online, and some have had issues because of class timings. They have to face several interaction problems, including low sound quality, poor PowerPoint slides, poor images, and delayed feedback. Narrow signals don't allow clear teacher-to-student communication.

This results in a waste of time and sometimes observable signs of frustration from both students and teachers (Muhirwa 2009). Mere relying on a single application would not lead us anywhere, because when Nigeria established an online learning system, courses were first delivered through print media. Efforts were made to share instructions with the help of AM and FM radio. English and communication courses were developed for beginners. Enrolled students were supplemented with audio tape recorders. Tutorials were organized at several study locations around the world (Jr 2014). In developing countries, lack of educational & technological infrastructure, lack of competent faculty, negative attitudes towards online learning, social & cultural restraints on girls, and unfit policy & funding decisions have further increased the gap between the poor and rich, rural and urban, and between genders. For the rural poor in the developing states, teachers, classrooms, books, money, and time continue to be significant issues. Although the availability of technologies has assisted developing economies in opening up to the global market, little has been done to assist disadvantaged groups in gaining access to educational opportunities. There is still a high percentage of people from lower social classes, rural areas, and females who continue to be excluded because of a lack of access to ample learning resources and primary education. There is a need to develop holistic policies that acknowledge these issues and focus on

primary and necessary infrastructure that can provide low-cost and high-quality access in disadvantaged areas. This would provide an equal opportunity for the people of deprived areas to contribute to the development of global knowledge (Gulati 2008). Pakistan was not ready for such an extreme shift in the education system. But due to COVID-19, a call for social distancing was given across Pakistan, followed by the closure of educational institutions; this shift towards remote learning was the last option. But it leads to a challenging situation not only for students but for teachers as well. Therefore, the present research has highlighted all the prominent and recessive challenges faced due to the e-learning system. So that areas could be considered by policymakers. So, whenever we need to shift towards e-learning in any unfavorable situation, the smooth running of the system can be ensured.

2. Literature Review

Online students have a higher attrition rate. Numerous factors influence student retention in an online learning environment. Students in an online setting may misinterpret and misjudge assumptions regarding an online course's time and effort. Furthermore, students have limited technological and academic experiences (Ortagus & Stedrak 2013).

In an online environment, the most commonly stated reason for not doing well in exams and dropping out is that students are left to self-study and alienation. There is a need to raise awareness that online learning is entirely different from classroom-based traditional learning and developing new curricula specifically designed for online learning (Andersson & Gronlund 2009).

Four hundred students enrolled in online learning classes from the rural and urban areas of Pakistan were surveyed. Results indicated that online learning infrastructure, which includes information quality, service quality, and system quality, directly influences the intentions toward online learning. This study also depicted that as technology is easy to use, people are more likely to use it and think it is useful. This is why ease of use and usefulness positively affect user intention to use online learning technology (Shah et al. 2013).

In developing countries, low socio-economic individuals' access to higher education is low. This is why online education in higher education programs is full of challenges because it will further expand the access gap, which ultimately causes a technological divide (Mashile & Pretorius 2003).

To distinguish helpful components and perceived challenges, 72 graduate students were surveyed. Results showed that course plans, student motivation, time management challenges, and ease with online learning technology significantly impact a successful online learning experience. Participants indicated technical problems, lack of community, time requirements, and trouble understanding online courses' objectives as challenges. This study recommended that there is a requirement for a successful instructional plan for online courses. The design should not merely focus on technological aspects but also the students' objectives, goals, and expectations. Online courses are dynamic on different levels. Information is received in different formats and at different times. When students are accustomed to learning in static and real-time settings, this will create time management issues. Assisting students in developing strategies for managing time may end up being valuable. Also, there is a need to work with students to develop a sense of community in online contexts. In last, best practices associated with an online learning environment continue to be explored so that it may end up being a significant source of learning (Song et al. 2004).

Similarly a meta-analysis of the relative distance education literature was carried out between 1985 and 2002. About 230 studies were analyzed. These studies demonstrated that many distance education applications outperform while many applications perform inadequately, and pedagogy is more important than the media. Researchers need to move beyond traditional versus online learning to such an inquiry that contributes more to our knowledge of what works best in an online learning environment (Bernard et al. 2004).

In another study which is conducted in Dubai Medical College and Dubai Pharmacy College to assess students' attitudes and perceptions towards an online learning system showed that only 4% of the students liked to have a fully online course, 23% favored complete traditional classroom course, and 73% favored mixed-mode rather than a complete web-dependent course. This study also determined the technical issue as a significant challenge in online learning. Effective strategies are required to improve access to computers, the internet, and the broadband width (Eldeeb 2014).

A survey was carried out to determine the critical factors affecting students' satisfaction in an online learning environment. The results showed that computer anxiety, teachers' attitude towards online learning, the flexibility of an online course, course quality, easy to use, ease in access, and variety of assessments are the factors that usually influence students' satisfaction in an online course (Sun et al. 2007).

The main barrier to online education is the lack of a robust telecommunication structure with staunch bandwidth, cost, and the ability to purchase necessary equipment. Lack of ICT skills is another obstacle that stops the majority of people from making use of ICTs. Educational programs intend to bring these skills to disadvantaged groups so that this wide range of barriers in promoting e-learning can be removed (Cullen 2001).

One of the crucial issues of most developing states is not having access to high-speed internet due to numerous factors, including intermittent electricity, untrained personnel, and expensive low bandwidth satellite technology. To get the benefits associated with online learning, developing nations need to develop innovative ways of delivering content online instead of relying on expensive and unreliable internet connections as an academic staff is overburdened by many students. Hence, the introduction of online learning is prone to faculty resistance. This is why it is necessary to train academic staff in the use of ICTs. (Omidinia et al. 2011).

Technology favors people who belong to high socioeconomic status or people residing in urban areas, whereas it neglects people of lower socioeconomic status and rural areas. This discrimination will continue to exist until the universities and governments develop large-scale projects that distribute resources allocated for education. New policies need to focus on developing such formulas that equalize technology spending (Chellman 2005).

Adopting online learning models in developing countries are more demanding because they lack effective implementation of ICT policies. The approaches & developing practices are also way different in the developing world because of several contextual factors, including users' demographics, government, institutional policies, and the digital divide based on the social background (Nawaz, 2012).

A thriving online learning environment requires the reconstruction of roles, responsibilities, and practices of online teachers. It is essential to comprehend the dynamics of a range of online learning environments, the discernments and conceptions that already exist, and how to make the best use of current technology to overcome barriers to a thriving learning

environment. Student readiness is fundamental for successful learning experiences. Students must prepare themselves for the changing demands relevant to online learning for technology, pedagogical practice, and learning management (Vonderwell & Savery 2004).

R1. To see the effect on university students in Punjab owing to the Sudden shift from traditional classrooms to digital learning due to Covid-19.

R2. To identify issues faced by university students across Punjab during online classes amidst Covid19.

R3. To examine the shortcomings in the policies shaped for university students' online education across Punjab in response to the Covid-19 crisis.

H1. There is a strong association between the lack of face-to-face interaction and students' understanding of the content being taught for online learning.

H2. Poor connectivity, Economic cost, and Institutional support are negatively associated with online learning.

3. Methodology

3.1 Research design, sampling, and Instrumentation

A cross-sectional field survey was conducted to address research objectives. A multi-stage sampling method was employed. As all students and teachers in Punjab were involved in online education during this pandemic (homogenous population), the data was collected from students (n = 379) from three different faculties of the University of Sargodha (Main-Campus), as it is one of Punjab's largest public sector universities. To measure challenges faced by students and teachers during online learning and teaching and policy gaps, a 2-point scale (Nominal Scale) was used to get information from students about internet access, economic feasibility, and basic skills, along with a 5-point differential scale (Semantic Differential Scale) to get to know students' attitudes, approaches, and perspectives regarding online learning. Descriptive statistics along with cross tabulation (Pearson Chi-Square) and multiple linear regression were used to summarize or describe the data.

4. Research Results and Discussion

Bi-variate Analysis (Hypothesis Testing)

4.1. Hypothesis 1

Alternative Hypothesis: There is a strong association between a lack of face-to-face communication and students' understanding of the the content being taught in online learning.

Null Hypothesis: There isn't a strong association between a lack of face-to-face communication and students' understanding of the content being taught in online learning.

Table 1: Face to Face Interaction

Do you enjoy learning online? (Online Learning)	How important face to face interaction is for fruitful learning? (Face to Face Interaction)					Total
	1 (Lowest)	2	3	4	5 (Highest)	
Yes	5	25	36	39	66	171

	1.3%	6.6%	9.5%	10.3%	17.4%	45.1%
No	14	16	27	30	121	208
	3.7%	4.2%	7.1%	7.9%	31.9%	54.9%
Total	19	41	63	69	187	379
	5.0%	10.8%	16.6%	18.2%	49.3%	100.0%

Table 2: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.467 ^a	4	.000
Likelihood Ratio	21.698	4	.000
Linear-by-Linear Association	5.493	1	.019
N of Valid Cases	379		

The aforementioned results showed that among 379 respondents who do enjoy learning online, 1.3% accounted for 1 (being the lowest) when they were asked about how important face-to-face interaction is for a successful learning environment, 6.6% accounted for 2, 9.5% accounted for 3, 10.3% accounted for 4, and 17.4% accounted for the 5 (being the highest). While respondents who don't enjoy learning online, 3.7% accounted for 1 (being the lowest) when they were asked about how important face-to-face interaction is for a successful learning environment, 4.2% accounted for 2, 7.1% accounted for 3, 7.9% accounted for 4, and 31.9% accounted for the 5 (being the highest). The *p*-value indicates that the above-mentioned variables aren't independent of each other and there exists a statistically significant relationship between lack of face-to-face communication and students' understanding of the content being taught to online learning, which shows that the above-mentioned alternative hypothesis "There is a strong association between lack of face-to-face communication and students' understanding of the content being taught to online learning" has been accepted. A study was conducted to find out about college students' experiences with online learning and face-to-face learning. Accordingly, students preferred taking easy academic subjects online and preferred taking difficult or important subjects online, which require a lower level of teacher presence face-to-face (Jaggars 2014). Teachers' verbal or non-verbal cues create psychological distance between their students and themselves, which ultimately promotes greater learning (Swan 2002). Lack of face-to-face interaction is one of the major limitations of online learning as students and teachers are physically separated from each other. This physical separation creates several barriers to effective communication (Sher 2009). The findings contradict the work of Comer (2013), as he believes that a lack of face-to-face interaction doesn't create much difference.

4.2. Hypothesis 2

Alternative Hypothesis: Poor connectivity, Economic cost & Institutional support are negatively associated with online learning.

Null Hypothesis: Poor connectivity, Economic cost & Institutional support are positively associated with online learning.

Table 3: Poor Connectivity

Do you enjoy learning online? (Online Learning)	Is there Load-shedding at your place of residence/area? (Poor connectivity)		
	Yes	No	Total
Yes	96	75	171
	25.3%	19.8%	45.1%
No	142	66	208
	37.5%	17.4%	54.9%
Total	238	141	379
	62.8%	37.2%	100.0%

Table 4: Chi-Square Tests

	Value	Df	Asymp. Sig. (2- sided)
Pearson Chi-Square	5.909 ^a	1	.015
Likelihood Ratio	5.904	1	.015
Linear-by-Linear Association	5.894	1	.015
N of Valid Cases	379		

Results of hypothesis II showed that among 379 respondents who do enjoy learning online, 25.3% opted for yes when they were asked if there was load-shedding at their place of residence or area. And 9.8% opted "no. While respondents don't enjoy online learning, 37.5% of them opted yes to the question "Is there load-shedding at your place of residence/area? And 17.4% opted not to. The *p*-value indicates that the abovementioned variable "**poor connectivity**" isn't independent of online learning and that there exists a statistically significant relationship between poor connectivity and online learning. High-speed internet access, continuous power supply, administration, maintenance, and availability of technology are all important aspects of implementing online learning (Qureshi et al. 2012). Not all students can have access to the necessary technologies that are required for online learning, which include fast internet connections and powerful computers. One problem that was observed in almost all countries during this pandemic was deficient bandwidth, causing connection failures during online classes (Ferri et al. 2020). Lack of access to high-speed internet, a lack of adequate interaction, and ineffective technology are among the major challenges to online learning in Pakistan (Ullah et al. 2020).

Table 5: Income Vs. Economic Cost

Family Income/Month (Income)	Are these Internet Packages economical? (Economic cost)		
	Yes	No	Total
41000-60000	66	110	176
	17.4%	29.0%	46.4%
610000-80000	58	53	111
	15.3	14.0%	29.3%

810000-100000	33	30	63
	8.7%	7.9%	16.6%
101000 and above	14	15	29
	3.7%	4.0%	7.7%
Total	171	208	379
	45.1%	54.9%	100.0%

Table 6: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.865 ^a	3	.049
Likelihood Ratio	7.902	3	.048
Linear-by-Linear Association	.032	1	.859
N of Valid Cases	379		

Results of the aforementioned table showed that among 379 respondents, students having family monthly income ranging from 41k-60k, 17.4% opted yes when they were asked are these internet packages economical and 29.0 % opted no. Students having family monthly income ranging from 61k-80k, 15.3% of them opted yes when they were asked are these internet packages economical and 14.0 % opted no. Students having family monthly income ranging from 81k-100k, 8.7% of them opted yes when they were asked are these internet packages economical and 7.9% opted no. For students having family monthly income ranging from 101k and above, 3.7% of them opted yes when they were asked are these internet packages economical and 4.0% opted no. The *p*-value indicates that above mentioned variable **economic cost** isn't independent of income and there exists a statistically significant relationship between income and economic cost. This issue is especially prevalent among middle class families having multiple kids, or parents who are engaged in jobs with less income (Ferri et al. 2020). The average monthly cost of internet in Pakistan is determined to be around 35 dollars. This figure, although it may seem like a lot, is somewhat notably low as compared to most countries, especially in the West, with the United States and Canada both going above \$40, as computed every month. However, with the average monthly income of the people of Pakistan, this amount is a sort of mountain compared to other countries that have considerably higher income per capita (Sheikh 2015).

Table 7: Online learning Vs. Economic Cost

How satisfied are you with the overall format of online classes? (Online Learning)	Are these internet packages economical? (Economic Cost)		
	Yes	No	Total
1 (Lowest)	50	76	126
	13.2%	20.1%	33.2%
2	33	46	79
	8.7%	12.1%	20.8%
3	32	50	82
	8.4%	13.2%	21.6%
4	35	27	62

	9.2%	7.1%	16.4%
5 (Highest)	21	9	30
	5.5%	2.4%	7.9%
Total	171	208	379
	45.1%	54.9%	100.0%

Table 8: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.807 ^a	4	.008
Likelihood Ratio	13.891	4	.008
Linear-by-Linear Association	8.758	1	.003
N of Valid Cases	379		

Results of the aforementioned tables showed that among respondents who are highly dissatisfied (1 being the lowest) with the online system, 13.2% find internet packages economical and 20.1% don't find them economical. Among respondents who ranked 2 as their satisfaction level with the online system, 8.7% find internet packages economical and 12.1% don't. Among respondents who ranked 3 as their satisfaction level with the online system, 8.4% find internet packages economical and 13.2% don't. Among respondents who ranked 4 as their satisfaction level with the online system, 8.7% find internet packages economical and 12.1% don't. Among respondents who are highly satisfied with the online system, 5.5% find internet packages economical and 2.4% don't. The *p*-value indicates that the abovementioned variable **economic cost** isn't independent of income and that there exists a statistically significant relationship between online learning and economic cost. According to the Inclusive Internet Index 2020, Pakistan ranked 76th out of 100 countries overall. Besides digital illiteracy and poor network quality, the country scored poorly in the affordability indicators. Only 35% of the population in Pakistan has access to the Internet. Apart from the class gap, there is also the rural-urban split. The University of Karachi, which is the largest in Pakistan, enrolls 30,000 students in the metropolitan city of Karachi. About two-thirds of students are from working-class family backgrounds, but they still either lack high-tech gear or are unable to purchase costly internet subscriptions (Baloch and Musyani 2020).

Table 9: Online learning Vs. Institutional facilitation

How satisfied are you with the overall format of online classes? (Online Learning)	How important is Institutional facilitation (Technical support, assistance, training, etc) for making online learning work? (Institutional Facilitation)					Total
	1 (Lowest)	2	3	4	5 (Highest)	
1 (Lowest)	25 6.6%	13 3.4%	14 3.7%	9 2.4%	21 5.5%	82 21.6%
2	2	20	24	4	29	79

	0.5%	5.3%	6.3%	1.1%	7.7%	20.8%
3	1	6	3	6	14	30
	2.7%	9.7%	3.0%	10.0%	11.8%	7.9%
4	3	4	19	19	17	62
	0.8%	1.1%	5.0%	5.0%	4.5%	16.4%
5 (Highest)	6	19	41	22	38	126
	1.6%	5.0 %	10.8%	5.8%	10.0%	7.9%
Total	37	62	101	60	119	379
	9.8%	16.4%	26.6%	15.8%	31.4%	100.0%

Table 10: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	83.019 ^a	16	.000
Likelihood Ratio	75.148	16	.000
Linear-by-Linear Association	17.876	1	.000
N of Valid Cases	379		

Data showed that among 379 highly dissatisfied respondents (1 being the lowest) with the online system, 6.6% opted for 1 (lowest) when they were asked how important institutional facilitation is for establishing a successful online learning environment, 3.4% opted for 2, 3.7% opted 3, 2.4% opted 4, and 5.5% opted for 5 (highest). Among respondents who ranked 2 as their satisfaction level with the online system, 0.5% opted 1 (lowest), 5.3% opted 2, 6.3% opted 3, 1.1% opted 4, and 7.7% opted 5 (highest). Among respondents who ranked 3 as their satisfaction level with the online system, 2.7% opted 1 (lowest), 9.7% opted 2, 3.0% opted 3, 10.0% opted 4, and 11.8% opted 5 (highest). Among respondents who ranked 4 as their satisfaction level with the online system, 0.8% opted 1 (lowest), 1.1% opted 2, 5.0% opted 3, 5.0% opted 4, and 4.5% opted 5 (highest). Among respondents who are highly satisfied with the online system, 1.6% opted 1 (lowest), 5.0% opted 2, 10.8% opted 3, 5.8% opted 4, and 10.0% opted 5 (highest). The *p*-value indicates that the abovementioned variable, institutional facilitation, isn't independent of online learning and that there exists a statistically significant relationship between online learning and institutional facilitation. Institutional facilitation plays a major role in making any online learning initiative work (Fetzner 2003). The *p*-values of the above three variables (poor connectivity, economic cost, and institutional support) show that they are not independent of each other and that there is a statistically significant relationship between them. This means that the alternative hypothesis, "Poor connectivity, economic cost, and institutional support are all bad for online learning," is true.

Multiple Linear Regression

Table 11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.737 ^a	.544	.517	.85001
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The above table provides the *R* and *R*² values. The *R* value represents the simple correlation and is .737 (the **R** column) which indicates a high degree of correlation. Values between 0.7 and 1.0 (-0.7 and -1.0) indicate a strong positive (negative) linear relationship via a firm linear rule. The *R*² indicates how much of the total variation in the dependent variable **Online learning** can be explained through independent variables (Enjoyment, Effectiveness, English proficiency, Institutional facilitation, Teachers’ feedback, Sense of community, participation, connection, motivation, focus, Self-discipline, confidence, Face to Face interaction, Time consumption, Load-shedding, Economic cost, Stable WiFi, ICT skills, HEC guidelines, and Govt support). In this case, 54% can be explained.

Table 12: ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	307.588	21	14.647	20.272	.000 ^b
	Residual	257.937	357	.723		
	Total	565.525	378			

The **ANOVA** table reports how well the regression equation fits the data. The table indicates that the regression model predicts the dependent variable significantly well. Here, $p < 0.00$ which is less than 0.05 and indicates that, overall, the regression model statistically significantly predicts the outcome variable.

Table 13: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.915	.416		2.201	.028
	Enjoyment	-1.058	.117	-.431	-9.053	.000
	Effectiveness	-.584	.136	-.205	-4.310	.000
	English Proficiency	.248	.052	.239	4.780	.000
	Institutional facilitation	.143	.047	.156	3.060	.002
	Teachers’ feedback	.187	.052	.181	3.576	.000
	Sense of community	.292	.049	.294	5.974	.000
	Participation	.216	.047	.227	4.557	.000
	Connection	.126	.049	.133	2.570	.011

Motivation	.374	.052	.382	7.1 63	.000
Focus	.298	.047	.256	5.7 33	.000
Self-Discipline	.279	.042	.301	6.6 17	.000
Confidence	.282	.046	.313	6.1 57	.000
Face to Face interaction	.048	.020	.121	2.3 58	.019
Time-consumption	.245	.049	.248	4.9 62	.000
Load shedding	.350	.127	.139	2.7 62	.006
Economic cost	-.460	.123	-.187	- .3.7 36	.000
Stable WiFi	-.457	.125	-.187	- .3.6 63	.000
ICT skills	-.601	.145	-.216	- .41 35	.000
Access	.192	.067	.145	2.8 51	.005
HEC guidelines	.399	.047	.400	8.4 64	.000
Govt support	.356	.047	-.367	7.6 59	.000

Online learning

The **coefficient** value in multiple linear regression represents how much the mean of the dependent variable changes when the independent variable is changed by one unit while the other variables in the model remain constant. The ability to hold other variables constant is critical because it allows you to assess the effect of each variable in isolation from the others. Whereas the sign of a linear regression coefficient tells whether there exists a positive or negative correlation between each independent and the dependent variable. A positive coefficient shows that an increase in the value of the independent variable causes the dependent variable to increase as well whereas a negative coefficient shows that the rise in the independent variable causes the dependent variable to rise as well.

The above **Coefficients** table provides us with the necessary information to predict whether all these aforementioned independent variables (enjoyment, effectiveness, English proficiency, institutional facilitation, teachers' feedback, sense of community, participation, connection, motivation, focus, self-discipline, confidence, Face to-Face interaction, time consumption, load-shedding, economic cost, stable WiFi, ICT skills, HEC guidelines, and government support) contribute statistically significantly to the model by looking at the "**Sig**" column. Also, the values in the "B" column under "Unstandardized Coefficients" can be used to make the regression equation look like this:

Online learning= (-1.058) + (-.584) + (.248) + (.143) + (.187) + (.292) + (.216) + (.126) + (.374) + (.298) + (.279) + (.282) + (.048) + (.245) + (.350) + (-.460) + (-457) + (-.601) + (.192) + (.399) + (.356) + .915

5. Conclusion

The present study has shown that the majority of students don't have ICT skills, the means to buy a reliable source of high-speed Internet, and an uninterrupted supply of electricity (load-shedding). Many rural locations have no electricity or unreliable internet service, making it difficult to support most of the online portals used by universities to teach, such as Zoom, and university teachers have never been trained to conduct lessons this way or they aren't familiar with the adequate ways of assessing students online. The universities themselves lack sufficient resources for creating a successful learning and teaching environment. Students frequently feel alienated rather than part of a learning community in which they may share their opinions and thoughts because of a lack of face-to-face/social interaction with teachers and other fellow students and delayed feedback as teachers and students are operating at different times and spaces. Conventional learning or teaching pedagogy can't simply apply to online learning and teaching. This study has shown that different ways of thinking and doing things are needed to create a new pedagogy that takes into account all the variables that have been found.

6. Recommendations & Policy Implications

Winning this long-term incline will require increased education financing from local and international sources. Covid-19 is going to affect budgets, but this isn't going to change the fundamental demographic fact: Education systems in underdeveloped or developing countries must grow, which will help the youth of these countries to profoundly alter the world. This would require strong efforts by governments to prioritize spending on education within their budgets; international donors to prioritize education financing; and a mindset by everyone to increase social support programs. Holistic policies must be developed to recognize these impediments and focus on essential infrastructure that can provide low cost and easy access to disadvantaged communities. This allows people with equitable opportunities in disadvantaged places to be involved in the progress of the country. It is therefore vital for educational institutions, governments, and policymakers to address the abovementioned impediments in the most effective way in the particular country's context.

Declaration of Interest Statement

There is no clash of interest between the authors.

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