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## ONLINE LEARNING IN COVID 19: A CASE STUDY OF PAKISTANI UNIVERSITIES

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### ABSTRACT

COVID-19 has not only affected the global economic order but also disrupted the education system of in person class teaching at global level. Pakistan is not also an exception to this. Pakistan, being a developing country, has already been facing economic problem that has further engraved due to widespread COVID-19. The only solution, in the absence of any vaccine or medicine, is social distancing. Starting from March 2020, the outbreak of COVID-19 resulted in the beginning of online education due to closure of the University throughout Pakistan. Face to face class room teaching is not possible during this period of social distancing. Online teaching is the only possible solution to continue the teaching particularly at university level to complete their education on time to get ready to enter in practical life.

**Purpose:** This study aims to identify the difficulties and problems of online teaching in Pakistan.

**Method:** The data is collected by using Google form from almost 600 students, of different university across Pakistan, who were engaged in online learning through different platforms such as Google classroom, What's app, Zoom, Skype etc. The collected data has been **processed** through statistical analysis by using SPSS. **Conclusion:** The research concludes that, on one hand, the access of different for online teachings are difficult to access for students, whereas on the other hand, the quality of education has been deteriorated due to multiple issues.

**Keywords:** COVID-19; University, Online Learning, Education, Pakistan.

### Introduction

An invisible virus that has originated most probably from China and spread across the globe, from East to West, from North to South, within few weeks. COVID-19 was, most probably, originated from China, Wuhan in late 2019. Since then, it has affected more than 200 states across the globe. Corona Virus disease of 2019 (COVID-19) pandemic has created a unique environment in the global world where every individual is feeling fear to be a victim of this invisible virus. Within a short span of time since its emergence, it has proved to be as most lethal weapon of 21<sup>st</sup> century so far. The world is facing most serious financial crisis since great depression of 1930s.

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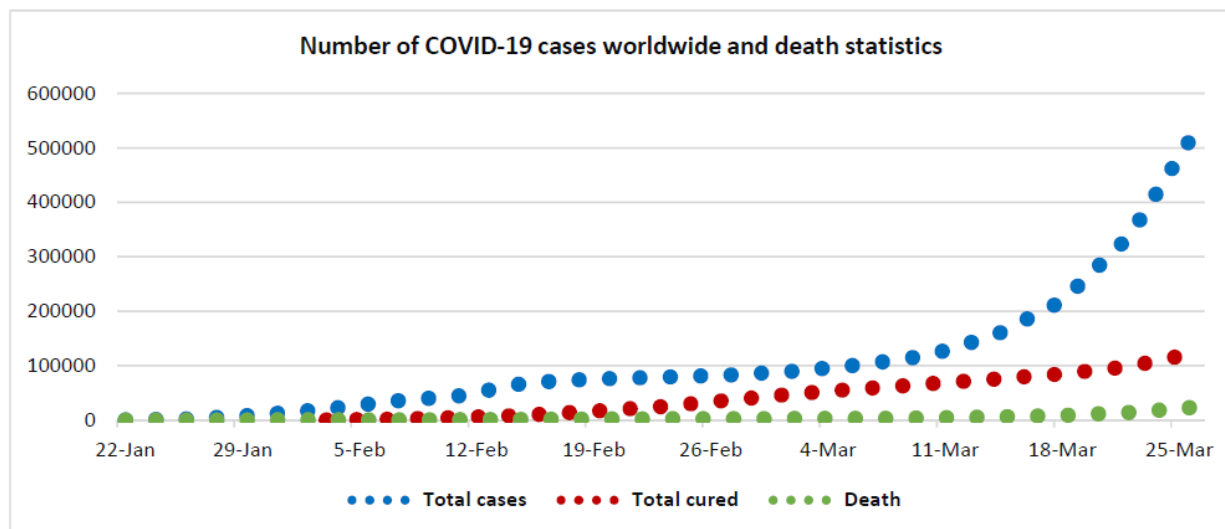
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The scientists of the modern age are trying to develop the vaccine to cure this pandemic. It has affected the people across the globe. The total number of patient has reached to 12624265 across the globe and Pakistan is touching 250000 till July 13, 2020 (COVID 19 Situation, Government of Pakistan).



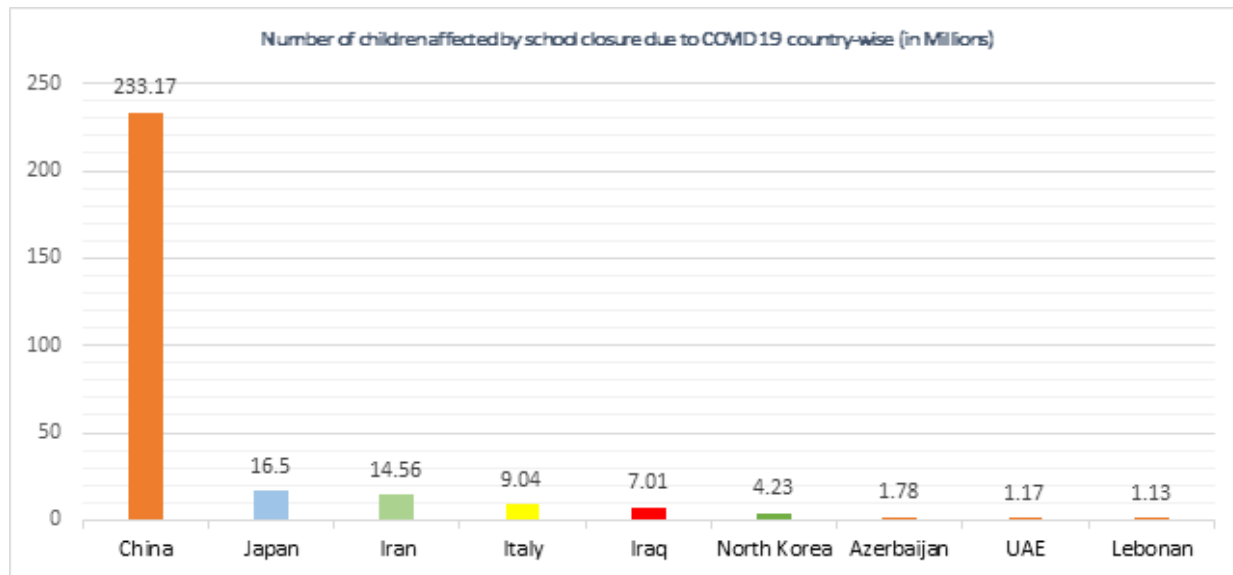
**Fig 1.** COVID-19 Statistics by Worldometer (22 Jan to 26 March 2020)

These ever increasing numbers are posing the most serious health crisis of the century till to date. A significant number of asymptomatic patients are also posing the threat of proliferation in number of cases. COVID 19 is considered as the most important global issue of the contemporary world. Many International Organizations particularly World Health Organization (WHO) is working day and night to fight against this pandemic. The scientist after initial studies regarding spread of COVID-19 warned that prevention of the infection caused by COVID-19 would be challenging (Bai et. al., 2020, 1407) Physical distancing and self-isolation are the only solutions to the problem so far.

The traditional face to face class teaching is not only difficult but also seems impossible in COVID 19 environment. Almost all the global institutions have been shifted or shifting towards online learning system. Millions of Children are affected because of closure of the schools and universities. Closure of universities interrupted both the interactive teaching and on time examinations assessment due to postponement or cancellation of examinations. Regular assessments of the students are necessary to know the progress of the students. Almost 61 states of Middle East, Asia, Africa and Europe have announced closure of universities in March 2020 (Bao, 2020, 113). Later on, almost 90% of the world population suffered due to closure of educational institutions in almost 100 states, UNESCO report states. As per report published by UNESCO, only closure of school had affected almost 1,543,446,152 making almost 90% of the

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total learners. (Humayun, 2020), 1333) . The countries like China has started online education in the beginning of 21<sup>st</sup> Century and offering more than 500 courses with enrolment of nearly 3 million (Shang & Cao, 2017).



**Fig 2.** Number of learners affected by COVID-19 worldwide (4 March 2020) (Source: Humayun, 2020, 1334)

## Pakistan and Corona

The first case was reported in Pakistan in early March 2020. Pakistan does not enjoy the good medical facility as the developed states have. So, Pakistan closed the educational institution as precautionary measure to adopt the only available remedy, physical distancing, that can help in blocking the proliferation of the virus among people. Moreover, later on, other measures such as closure of markets, shops, offices and banks were adopted to stop the spread of virus. Pakistani society faced multiple socio economic challenges in the wake of this shut down. This pandemic has far reaching economic, social and societal consequences in Pakistan. Traditional Mode of face to face teaching was on halt at school, college and university level. Students also suffered due to closure of educational institutions. The government decided to start online classes because there was no chance of opening of educational institutions in near future. For a country like Pakistan, where the students are facing multiple problems such as non-availability of infrastructure i.e. internet facilities, computer facilities, internet speed and broadband connection etc., it was a difficult decision. Online teaching techniques and EL model of education have been used by the developed states since many years. They have sufficient ICT infrastructure.

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However, it was a very difficult decision as Pakistan is not a technological advanced state and use of technology particularly in teaching is rare. The technological devices and broadband connections are very costly. The availability of internet is also an important issue at some places. The problems such as speed of internet and issue of connectivity are also faced by the students. Majority of the students particularly in public sector universities are also unable to pay fee due to financial crises in the wake of COVID-19. Public sector universities, already facing financial crunches, have to spend huge amount on developing learning tools such as Learning Management System (LMS). However, instead of all these difficulties, the universities have shifted the paradigm of traditional calls room and face to face teaching to online teaching by developing different tools and conducted online classes. Although, online classes are free from the burden of space and limitation of time. However, ICT infrastructure and economic resources are still insufficient. The availability of reading material, lecture and guidance through question answer sessions among students and teacher are different vital task to be necessarily performed through online education system.

### Literature Review

Humayun (2020) explored the growth of E-learning (EL) techniques by using the information and communication technologies (ICTs). She has described how EL tools have changed the traditional classroom learning. The paper has prescribed different EL tools for the EL practitioners to ensure the security of the EL data. The author has briefed about the using of Blockchain techniques to secure the EL system and process.

Bao (2020) explained the experience of online teaching in higher Education in Peking University. He concluded that online system is delivering education effectively through effective teaching and academic support to both students and teachers.

According to Insight report of Research Gate (2020), the researchers are spending more time in reading scientific research, writing scientific paper and peer reviewing during pandemic time. The researchers are collaborating more with other researchers instead of COVID 19 environment. They are shifting their techniques of research from labs to new ways of working. This shows that instead of current global environment, the researchers are performing well and the developments and innovations in the field of education had not affected much.

Andersson and Gronlund (2009) find that developing states are still facing challenges in E-Learning as compare to developed states such as course challenges that includes curriculum, teaching design and content of course; challenges pertaining to individuals' characteristics such as student's approach, motivation, social support, teacher's motivation, commitment, competence and qualification; technological challenges such as access to infrastructure and cost of technology; and contextual challenges such as organizational issues including knowledge

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management, training of staff and teachers and cultural and societal challenges including role of student and teacher, rules and regulations. This research has also contributed in developing a comprehensive strategy to overcome the challenges of e-learning in developing states.

Weippl and Ebner (2008) have pointed that e-learning is posing security challenges in using of internet particularly when educational institution is controlling the e-learning of that individual. They also pointed out that e-learning can also cause privacy breach.

Alhabeeb and Rowley (2017) have shown through their research that how three important universities of the Saudi Arabia has not only successfully developed e-learning mechanism but also implemented that successfully. The research emphasized that students, teachers and university management together played vital role in making the e learning a successful experience in these three institutions of higher education in Saudi Arabia.

The research study of Institute of Cost and Management Accountants of Pakistan (ICMA) (2020) entitled "Economic Impact of COVID-19 on Pakistan" explained the multiple effects of COVID-19 on Pakistan. The report claimed that COVID-19 would affect economic growth of Pakistan in terms of decrease in tax revenue, reduction in foreign remittances, increase in poverty and unemployment. Manufacture sector in Pakistan would also suffer from this pandemic.

Salik (2020) also claimed that the most important concern of the government had been the impact of lockdown on poor segments of the society. A state with already fragile economy could hardly sustain this economic challenge. The projected economic loss can be up to 4% of the GDP due to multiple reasons such as disruption in Foreign Direct Investment (FDI), decline in trade, tourism and aviation. A lot of amount would be required to strengthen the substandard medical infrastructure to cope up with such pandemic situation. This will lead towards further decline in the economic progress of the country. In addition to this, Pakistan's Foreign Exchange Reserves were declined to 11.2 \$billion from \$12.8 billion only in a single month of March amid Corona outbreak. Furthermore, the World Bank (WB) also estimated the \$17 billion remittances in Pakistan in 2020 as compared to \$22.5 billion in 2019 making almost 23% less. (Salik, 2020, 1-2) This grave economic condition may put Pakistan into further dependency over donor states and International financial Institutions.

Saleem (2020) described that COVID-19 impacted the Belt Road Initiative (BRI) and China Pakistan Economic Corridor (CPEC). The project was disrupted due to unavailability of labor force that stayed home due to pandemic situation. Foreign Minister of Pakistan, Shah Mehmood Qureshi also pointed out that CPEC would not suffer for long term but might be for short term due to COVID-19 situations. However in spite of this delay, the CPEC still provides many windows of opportunity for both Pakistan and China. It is very vital for Pakistan particularly because the economic impact will be more severe for Pakistan as a developing country as compared to the developed states such as US and China.

## Impact of COVID-19 over Education in Pakistan

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COVID-19 has affected almost every walk of life in Pakistan such as industries, hotels, small businesses. Similarly, educational institutions and education have also suffered a lot due to COVID-19. It is one of the major area that has been suffered and lead towards social disturbance and economic recession as well. The government has not only closed all school, colleges and universities but also postponed examinations of all classes for indefinite period.

### **Online Learning in Universities**

Education is the main instrument for the development of any state. The modern developed world is a result of modern innovations that are possible only through education. Mostly developed states of the world have already shifted their education to online learning/teaching. World Health Organization (WHO) has also recommended shifting the in person face to face teaching towards online teaching. Many developed states of the world has already using online communication platforms effectively even before COVID-19 such as the blackboard system and has access to majority of online academic resources from home. Almost 100 million users are using blackboard system across 90 countries with around 16000 clients across the globe (Humayun, 2020, 1335)

Pakistani universities were closed on first week of March 2020 in the wake of pandemic. Educational institutions started to find alternative techniques to teach students to avoid loss of students by arranging online classes. Pakistan has not such mechanism of online communication earlier. Even students had rarely enjoyed access to online academic source from home. The government announced to start online teaching. However after few days, multiple problems were highlighted and some universities continued their online teaching through whereas some universities announced to postpone the online teaching till the development of proper online teaching mechanism such as Learning Management System (LMS). Although a lot of free interactive tolls are available in Pakistan, just like in any other developing or under developed states, such as Google Classroom, WhatsApp, You Tube etc. The use of a simple, easy and appropriate tool is the foremost important challenge in online teaching. It is interesting to note that many universities have been offering distance learning courses but they have not developed any effective tool through which they can meet the contemporary challenge of paradigm shift from face to face teaching to online teaching of regular classes. The developing of alternate mechanism of a traditional classroom teaching is a difficult task for students, teachers and university administration particularly in an environment where the state has very limited economic resources with no proper developed mechanism of E learning.

### **Data Analysis**

Gender	Frequency	Percentage
Male	290	49.07

Female	301	50.93
	591	100.00

Income	Frequency	Percentage
Less than 25,000	181	30.63
25,001 – 50,000	204	34.52
50,001 – 75,000	92	15.57
75,001 – 100,000	54	9.14
More than 100,000	60	10.15
	591	100.00

Education Level	Frequency	Percentage
Bachelors	458	77.50
Masters	109	18.44
MPhil	21	3.55
PhD	3	0.51
	591	100.00

Faculty	Frequency	Percentage
Arts & Social Sciences	133	22.50
Economics, Business, Commerce	353	59.73
Natural Sciences	48	8.12
Engineering	11	1.86
Technical Education (diplomas etc.)	2	0.34
Medicine (MBBS and BDS only)	15	2.54
Pharmacy	1	0.17
Veterinary Sciences	5	0.85
Agriculture	21	3.55
Languages	2	0.34
	591	100.00

Area of Residence	Frequency	Percentage
Urban	341	57.70
Rural	250	42.30
	591	100.00



**Table. 1. Availability of computer and internet connection for online classes.**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(1a) I have easy access to computer or any such device for online classes	15.57	45.01	19.97	14.21	5.25
(1b) I have easy access to internet connection	10.15	36.38	24.03	21.66	7.78
(1c) The internet connection / access is available whenever I require.	8.29	28.60	28.43	25.04	9.64
(1d) I don't have any problem with the speed of internet for online classes.	6.26	18.44	19.80	34.52	20.98
(1e) I think that I have problem with the availability of internet for online classes for me	19.46	37.39	20.64	18.44	4.06

The Table 1 describes the most important issues of online learning such as availability of computer, broadband and internet speed. The data shows that majority of the students have access to computer devices for online classes. Almost 46.53% have easy access to internet connection. However in term of internet speed, the majority of the students are facing problems as 55.50% of the respondents have problems with the speed of internet.

**Table. 2. The quality and regularity of online teaching**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(2a) The online classes are being taken regularly.	19.12	42.64	20.47	12.69	5.08
(2b) The regularity of online classes is better than face to face classes.	5.41	9.64	11.17	28.43	45.35
(2c) The online class starts on time.	10.66	37.39	25.89	17.43	8.63
(2d) The start timing of online class is better than the face to face class	5.25	16.07	18.95	29.78	29.95
(2e) The online class finishes on time.	8.97	42.98	20.47	17.77	9.81
(2f) The teachers are well prepared for online classes.	11.84	36.04	26.57	14.38	11.17
(2g) The teachers are better in teaching online classes as compared to face to face classes.	3.05	9.64	19.80	32.32	35.19
(2h) The teachers are able to demonstrate the Practical (where applicable) effectively.	2.03	23.35	31.98	23.35	19.29



Table 2 describes about the regularity and quality of online classes. The survey shows that majority of the students i.e. 61.76% opines that classes are being taken regularly. However an overwhelming majority around 73.78% are not satisfied about regularity of online teaching as compared to face to face teaching. Majority opines that classes starts on time and finishes on time. However when students compared it from face to face teaching, 59.73% considers that the class start time in online teaching is not better as compared to face to face teaching. Although teachers are well prepared for online class according to 47.88% yet 67.51% considers that teachers are not better in teaching as compared to face to face classes. Similarly only 25.38% agree with the ability of teachers in demonstrating online practical effectively. This part shows that regularity and quality of teaching is good overall in online classes when students consider the independently but when students compare it with face to face teaching, the quality and regularity of online teaching is not good.

**Table. 3. The provision of study material and resources**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(3a) The teacher are providing me enough study material	5.75	40.78	27.07	17.09	9.31
(3b) I have easy access to the teaching resources like books / handouts	5.75	34.86	25.55	22.50	11.34

Table 3 describes the provision of reading material and access to learning resources. 46.53% agree that teachers are providing enough study material. Similarly 40.61% agree that they have easy access to books and hands out and almost 33.84% do not have access according to the results. This shows that less than half per cent of the students have proper reading material during online classes.

**Table. 4. Online Learning Experience**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(4a) I am overall satisfied with the learning experience of online classes.	3.21	16.24	21.83	28.60	30.12
(4b) The overall learning experience in online classes is better than the face to face classes.	1.81	8.97	13.87	35.70	40.27
(4c) I can ask questions to the teachers as easily as in face to face classes.	8.12	31.81	20.14	21.15	18.78
(4d) Teacher is able to answer my question	9.48	39.93	27.75	16.75	6.09

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easily					
(4e) I am often satisfied with the answers provided by the teacher	6.94	40.27	32.66	12.86	7.28
(4f) I think that teacher was better in answering my question in face to face classes	35.70	31.98	16.07	9.81	6.43
(4g) The discussion on study topic in online classes is as easy as it is in face to face classes.	2.71	14.38	18.95	39.09	24.87

Table 4 describes the quality and experience of online learning experience of the students. Only 19.45% are satisfied with the learning experience of online classes. An overwhelming majority of 75.97% opines that online learning experience is not better as compared to face to face classes. 39.91% agree that asking questions from teachers in online classes is as easy as in face to face classes and almost similar percentage (39.93%) disagree. 49.41% agree that teacher is able to answer the questions of the students. However, merely 20.14% are not satisfied with the answer given by the teacher in response of question asked by the students. But when it comes to comparing of face to face classes with online classes, 67.68% opines that teachers can answer better in face to face class. Only 17.09% agree that discussion in online classes are easy as compare to face to face classes.

**Table. 5.** Online examination and student satisfaction

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(4h) I think Examinations can be fairly conducted through online medium	5.75	17.94	18.95	21.49	35.87
(4i) I am concerned that my results will not be as good as previous examination.	34.86	32.32	21.49	7.78	3.55
(4j) I have no concern over results of online exams.	5.08	18.61	22.67	30.80	22.84

Table 5 describes about the concerns of the students regarding online examination. Only 23.69% agreed that examinations can be fairly conducted through online system. It shows the serious concern of the majority of students about the online examination system. Similarly an overwhelming majority of 67.18% showed their fear that their result could not be as good as of previous examination. 53.64% showed their concern regarding their result of online examinations. This survey clearly shows the concern, fear and dissatisfaction of the students regarding online examinations and results.

**Table.6.** Financial issue and financial burden of online teaching

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(5a) Online teaching has put extra financial pressure	31.89	31.13	18.78	14.72	3.83
(5b) Online learning has decreased financial burden	9.64	21.49	20.81	28.43	19.63

Table 6 describes about the financial burden of online learning over the students. 63.02% students opine that online teaching has put extra financial pressure over the students. Only 31.13% agree that online classes has decreased financial burden. This can be said that students are facing extra financial burden due to multiple issues such as internet charges, computer and printer and scanner or smart phone to continue online study.

**Table. 7. Experience of paradigm shift from face to face learning to Online learning**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(6a) I had no problem in switching to online mode of studies in the beginning of online classes.	4.23	21.32	26.23	30.12	18.10
(6b) I am still facing problems.	26.23	39.42	19.46	12.35	2.54
(6c) The overall transition from face to face teaching to online learning is easy	5.41	16.41	24.03	34.86	19.29

Table 7 describes the overall experience of the university students regarding paradigm shift from face to face teaching to online teaching. Only 25.55% agree that they have no problem in switching of classes to online mode. Even after continued learning, majority of 65.65% is still facing problems in taking online classes. Merely 21.82% considers that transition from face to face teaching to online learning is easy. This shows that Students have not good experience of this paradigm shift from face to face learning to online learning.

**Table. 8. Prospects of online teaching**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
(7a) Online teaching should continue	2.03	13.37	13.03	29.95	41.62

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(7b) Online teaching is easiest way of learning	2.88	12.35	17.94	32.49	34.35
(7c) I am able to concentrate on my studies as before COVID 19	10.32	35.87	16.07	18.44	19.29
(7d) Universities should be closed during COVID 19 as semester break	40.78	28.76	13.71	11.17	5.58
(7e) My daily routine is disturbed due to online learning classes	38.24	33.50	13.87	12.69	1.69
(7f) My study hours have been increased due to online learning classes	21.49	32.66	22.00	15.74	8.12

Table 8 pronounces about the future prospect of online teaching in the opinion of the university students. In response to a statement regarding the continuation on online teaching, only 15.40% agree whereas overwhelming majority (71.57%) disagrees. Moreover, 66.84% rejects the notion that online teaching is the easiest way of learning. The response of 46.19% shows that COVID-19 has affected their concentration over study whereas 37.73% has not affected in terms of concentration over their studies. 71.74% agrees that online classes have disturbed the daily routine of the students. In response to a statement regarding increasing study hours of the university students due to online classes, 54.15% agrees. These responses show that prospects of online teaching are not good due to dissatisfaction of students.

## Conclusion

Pakistan, being an undeveloped state, is lacking behind in the field of technology on one hand and facing financial crises with almost more than fifty per cent of the population living below poverty line. COVID 19 pandemic has further aggravated the situation in such states in terms of economic recession. Education is one of the most important tools of development and COVID 19 has affected the education most because the other routine business has restored in many states with precautionary measures but these precautionary measures can not be implemented in education particularly in universities where a large number of students are studying in one class. In Pakistan, a large number of students, in universities, live in the hostels, on campus or outside, accommodating sometimes 3 or 4 students in a single room. So it is quite impossible to live in such conditions. Therefore, like other states, the universities in Pakistan have started online education system for the university students. The study concludes that instead of this difficult situation and multiple problems, the online system of learning at university level is running smoothly. The students are learning through online education and they have access to reading material. The teachers are teaching regularly. However when online learning is compared with face to face in class teaching, the students prefers face to face teaching. Primarily, the students are facing problems due to technological issues such as availability of broadband connection and internet speed. The research also shows that online teaching has put extra financial burden over

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the students because of high cost of broad band connectivity. Moreover, students also feel fear about their results in online education. They are of the opinion that they cannot maintain their previous performance through online system of examination. They opines that face to face class teaching is better than online learning in terms of regularity, punctuality, availability of academic resources, class discussion and question answer session. The results show that a large number of students don't want to continue online learning rather they are of the opinion that this period should be treated as semester break during COVID 19 period. The research concludes that Pakistan is not as advanced in technological field just like many other advanced states that were already using the technology for education so it is very difficult for students to shift from Traditional class room approach of face to face teaching mechanism to online teaching method. Most importantly because online learning and teaching is majorly dependent upon the availability of fast and uninterrupted internet connection that is still unavailable even in many main areas of Pakistan. The government must introduce low cost ICT substitutes such as smart phones, radio and television to give students easy and cheaper access to different modes of online learning.

## REFERENCES

- Alhabeeb, A. and Rowley, J. (2017), Critical success factors for eLearning in Saudi Arabian universities, *International Journal of Educational Management*, Vol. 31 No. 2, pp. 131-147.
- Andersson, Annika and Ake Gronlund, (2009) A Conceptual Framework for E-Learning in Developing Countries: A Critical Review of Research Challenges, *The Electronic Journal on Information System in Developing Countries*, Vol. 38 Issue 8, p. 1-16
- Bai, Yan, Lingsheng Yao, Tao Wei, Fei Tian, Dong-Yan Jin, Lijuan Chen and Meiyun Wang, (2020) Presumed asymptomatic carrier transmission of COVID-19. *JAMA*. April 14, 1406-1407.
- Bao, Wei (2020), COVID-19 and online teaching in higher education: A case study of Peking University, *Hum Behav & Emerg Tech*. 2020;2: 113-115.
- COVID 19 Situation, Government of Pakistan, available at <http://covid.gov.pk/stats/global>, accessed on July 13, 2020.
- Humayun, Memona (2020) Blockchain-Based secure framework for e-learning during COVID-19, *Indian Journal of Science and Technology* 13 (12): 1328-1341.
- ICMAP Research Report (2020), "Economic Impact of COVID-19 on Pakistan" Institute of Cost and Management Accountants of Pakistan

<http://epistemology.pk/>

Insight report of Research Gate (March 31, 2020), COVID-19 Impact on Global Scientific Community, available at [https://www.researchgate.net/institution/ResearchGate/post/5e81f09ad785cf1ab1562183\\_Report\\_COVID-19\\_impact\\_on\\_global\\_scientific\\_community](https://www.researchgate.net/institution/ResearchGate/post/5e81f09ad785cf1ab1562183_Report_COVID-19_impact_on_global_scientific_community), accessed on April 15, 2020.

Saleem, Haider Ali, (2020). COVID-19: Impact on BRI and CPEC, Issue Brief, May 5, Institute of Strategic Studies, Islamabad.

Salik, Ahmad Naeem (2020), Impact of COVID-19 on Economy of Pakistan, Issue Brief, May 2, Institute of Strategic Studies, Islamabad.

Shang, J. J., & Cao, P. J. (2017), The Preliminary exploration of development strategy of higher education informatization in China. Peking University Education Review, 15(1), 173-182.

Statistics by Worldometers (2020), available at <https://www.worldometers.info/coronavirus/worldwide-%20graphs/#total-cases>, accessed on April 16, 2020.

Weippl, E.R. & Ebner, M. (2008). Security Privacy Challenges in E-Learning 2.0. In C. Bonk, M. Lee & T. Reynolds (Eds.), *Proceedings of E-Learn 2008--World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*. Las Vegas, Nevada, USA: Association for the Advancement of Computing in Education (AACE), pp. 4001-4007, available at <https://www.learntechlib.org/primary/p/30247/>, accessed on May 12, 2020.