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Learning Losses during Covid-19 Pandemic in Pakistan: A Critical Assessment of Online Education System

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Abstract: *The Covid-19 compelled the educational sector around the world to adopt online techniques to run the educational setups. This study is intended to evaluate the effects and challenges faced by the online education system and to assess them in the wake of the pandemic in Pakistan. This research paper attempts to analyze the success level of online education and the issues faced by the teachers and students. Data was collected from teachers and students at undergraduate and post-graduate levels. It was found that online setup was more successful at the university level, particularly in social sciences, as compared to pure sciences. Online academics at the lower levels remained significantly unsuccessful. Since both faculty and students were not equipped with the new techniques to convert conventional academics into online learning. The significance of this study is that it has pinpointed the obstacles for the online education process during the lockdown in Pakistan.*

Introduction

COVID-19, a disease named by World Health Organization (WHO) on February 12y 2020, has disrupted almost all the sectors of society everywhere in the world, ranging from economic to social and political structures. The first case of coronavirus was diagnosed in the province of Wuhan, China on December 31r 2019, following the closure of seafood markets in Wuhan. COVID-19 was declared as a global emergency by the WHO on February 1y 2020. With the outbreak of the disease outside China, COVID-19 was declared a pandemic on March 11h 2020. (WHO, 2019) Among all other sectors during a pandemic, education remained the worst affected area. The closure of the education lasted for more than half a year during a pandemic. Throughout lockdown, the advanced countries converted their physical education into an online system for which they were familiar and equipped. The pandemic of

COVID-19 not only affected global public health, but also affected political, economic, religious and educational strata of society (WHO, 2020a)

According to UNESCO report the covid-19 pandemic has badly hit the educational sector, where it affected 1.6 billion students across the world in more than 190 countries of the world. In the 99 percent of poor and low earning countries the closure of educational institutions affected 94% of the country's student population. As the majority of the people had lost their jobs and businesses some 23.8 million additional students at different levels are expected to drop out of their educational institutions (UNESCO, 2020). Around one hundred countries are still not sure about reopening the institutions. Probably 465 million students who are targeted to receive distance/online education have no access to the internet across the world (CERP, 2020).

In comparison to advanced countries, the developing countries faced formidable challenges in educating their students through E-Learning mediums. In Pakistan, like all other developing countries, education is adversely affected due to Covid-19 closure. Pakistan has already been lagged behind in the field of education. This pandemic closure proved worse in history. Pakistan was not prepared for the conversion of the physical classroom into the online education system. The acquisition of required technology for both students and teachers remained a challenging task for this abrupt conversion. The most affected among them were younger children, especially those who are enrolled in government schools which are not equipped with computers and internet facilities. Most of the government schools and colleges are located in remote areas which are yet to be electrified. According to the World Bank report 2020, the losses in the educational sector in Pakistan were equal to 1.5 to 2 school years. Online learning in Pakistan couldn't produce the desired results as in Pakistan, only 36.86% population has access to broadband internet (PTA, 2019).

According to a World Bank study, in addition to 22 million children out of schools, some 90000 more children are estimated to be dropped out from primary and secondary education systems in Pakistan. The year 2020 proved a nightmare for the low-cost private schools. Following the closure policy was mandatory for all public and private educational institutions. The long period of idleness made it difficult for them even to pay the building rents and teachers' salaries, and other necessary expanse like utility bills and property taxes. Due to the stagnancy and losses to the government in the field of economy Higher Education Commission (HEC) was granted only with 64.4 billion rupees, while HEC demanded 104.789 billion recurring grants. HEC also demanded Rs.42.6 billion as a development budget, while it was granted with only 29.4 million under Public Sector Development Program (PSDP) (Pakistan Economic Survey 2018-2019).

COVID-19 is a menace to Pakistan's friable education system and its infrastructure. The objective of this study at first is, to evaluate and examine the impacts and challenges faced by the online education system. Secondly, this research study shall make an attempt to devise a mechanism of how to respond to these challenges in the wake of the COVID-19 perspective (WHO, 2020b)

"While access to education was already a problem in Pakistan – 22.8 million of Pakistan's over 70 million children are out of school – the coronavirus outbreak has exposed its profound technological inequities. Over 50 million school and university-going Pakistanis now risk falling behind", says Ambreen Arif, a top education advisor for Pakistan's central government. Pakistan ranked 152 out of 189 countries of the world in terms of the Human Development Index (HDI) (UNESCO, 2020).

According to Pakistan Economic Survey, the literacy ratio in Pakistan is only 57%. The drop-out ratio is 22.7% in primary schools in Pakistan, which is 3rd highest in the South Asian region after Bangladesh and Nepal. The number of teachers serving in these primary schools is 522400 in 172.5 thousand primary schools and 448100 thousand teachers in 46700 middle schools. Total 31400 secondary schools were observed functional during the years 2017-18. There are 5800 higher secondary schools/inter colleges with 123200 teachers. There are 3700 technical and vocational institutions with 18200 teachers. There are1659 degree colleges with 41233 teaching staff and 211 universities with 51500 faculty members in both public and private sectors. With such alarming figures, Pakistan has the world's weakest higher education system and has been ranked 50th among the top 50 higher education systems in the world (Pakistan Economic Survey 2018-20F19).

Literature Review

Research on the impact of Covid-19 on education is scarce in the context of Pakistan (Kermani 2020). The response of the educational sector to the current pandemic has made many inefficiencies visible in the context of the Pakistani education system. E-learning

has not been a preferred medium of instruction, even when it was optional in the pre-pandemic days. The government has also not given it any serious attention, so the situation of digital learning has worsened, bringing with it a loss in learning to the students and affecting the teaching quality adversely. The education sector lacked the necessary training and technology, leading to excessive stress among all stakeholders, including the faculty, the parents, and of course, the students at the education institutions (Ahmad, 2020).

The losses in education due to closures have had catastrophic impacts on the education sector, and the most worrisome part is the fact that these losses will translate into future years and students will have to deal with the issue in the years to come. According to one estimate by academia magazine, some experts have predicted that the education sector has faced losses of two billion dollars approximately in the current pandemic. These immediate losses will translate into future losses initiating a vicious cycle. School closures during the earth quack 2005 resulted in a 1.5 to 2 years loss the study time. According to Masood and Qureshi 2020, the effect of those losses continued for a period of four years after the earth quack (The Academia Magazine, 2020).

The effects are not just in education in terms of loss of learning but also in monetary terms. Such closure deeply impacts economic outcomes for the students. Studies also estimate that such losses translate into a reduction of revenue in the adult life of students to have suffered closures of schools and educational institutions for such a long time. See, for example (Andrabi et, al 2020).

Given the nature of this phenomenon affecting the entire population, there is also a gendered dimension of these "learning losses" the female students in the patriarchal structure of Pakistani society have to take care of certain tasks assigned to them at home. The National Commission on the status of women 2020 believes that such students will have immense difficulty in balancing these chores and school activities.

Closure of schools has affected not only the students but teachers as well. E-Learning was the preferred medium during the pandemic to deal with the closure. However, the infrastructure required for it was not up to the mark in many areas of Pakistan, leading to immense problems for the faculty. Students in many rural areas have to climb mountains or to go far off places just so that they can get a good 4G signal to take their online classes. The lack of proper internet connectivity and the absence of necessary training required by both teachers and students proves to be a big obstacle (UN News, 2019).

Even before the pandemic, some institutions were using digital means for distance education. Allama Iqbal Open University is a pioneer in this field. Despite of the many advantages of online and distance education, there were many challenges. These includes the lack of proper infrastructure and necessary training. (Fergusan 2020) E-learning was not very welcomed by the people of developing countries like Pakistan. (Hassaan 2020) reports that the population in the developing countries are skeptical about online education, other issues include insufficient infrastructure and lack of training.

Pupils and teachers face capacity issues alike. Moreover, there exists a reluctance on the part of both teachers and students to adopt the new medium of technology as a preferred mode of imparting education. Even if students are given the technology in the form of Android or laptops, the fact that they don't know how to use it effectively renders the technology useless. (Zahra 2020) also report these as challenges.

Distance learning institutions in Pakistan, therefore, rely heavily on "print" as the preferred medium of instruction because the students and the teachers lack the capacity to fully utilize the digital mediums (Mukhtar 2020) reported the lack of training of the academic as the major hurdle since technology is of no use without proficiency.

(Mehmood 2020) reported that lack of required competency, availability of proper digital resources, and access to technology has

the major hurdles faced by digital E-learning programs in the case of Pakistan. 97% of the Pakistani population believe that the closures due to pandemics despite E-learning programs have negatively affected their children's education. A vast majority of them is not using technology such as mobile internet for the purpose of E-learning. The main reason behind that is a lack of proficiency and capacity. (O'Malley 2017)

Significance of Online Education

Though pandemic proved disastrous for the education sector in Pakistan. The main reason was that, unlike the education system of the developed world, Pakistan's education sector was unable to adjust itself with technological needs in the process of provision of online education. But still this online education proved an opportunity for Pakistani students in many ways. The cities that are provided with internet facility has shown high potential for online education. Some visible advantages are given as under:

First, Online education proved cost-effective and affordable in many aspects, such as a decrease in fuel charges because of no transportation, reduction in electricity consumption and charges in the educational institutions, evasion of wages of non-teaching staff, the decline in the consumption of unnecessary food and other beverages in the institution's cafeterias and lavish consumptions on their trips and other recreational activities like welcome and farewell get-togethers. On the other hand, a single online video lecture on YouTube has the ability to consume millions of followers.

Secondly, the number of internet users was significantly increased from 76.38 million i.e., 17% to 76.49 million i.e., 35% in the year 2020. (Haris 2020). The positive results of this improvement are that internet users are increased for a good cause to keep in touch with their academics.

Thirdly, the education system in Pakistan is not uniform. There are multiple strata of schooling for instance, an elite class like Beacon House, City Schools Educators etc. in almost every city of Pakistan. E-learning gave an opportunity to have access to the online contents to those who belong to lower and middle classes on an equity basis. Fourth, many jobless educators, trainers, and other freelancers availed a chance to launch their personal YouTube channels, which brought revolutions in the rise of the jobs industry from home.

Fifth, the education sector in Pakistan remained conservative and hostile to reforms. This COVID-19 closure of educational institutions disturbed the conservative chains and gave way to introduce new innovations in the learning process in a better way. Now students are able to enter into online classrooms with their fingertips from anywhere in the world. Due to the recording options, they can listen to the lectures again and again. For better understanding, there is a screen share option through which they can learn far better than the white board/blackboards in physical classrooms.

Sixth, pandemics brought new revolutions in distance education and the learning process. It gifted us to know about useful software like Microsoft Teams, Google Meet, Zoom and Google Class Room as the medium of instruction. This converted mobile and laptop screens to a perfect interactive class room. Seventh, E-learning also saved much of the time of both faculty and students. More than 50% of students of Peshawar university travel daily from Mardan, Nowshera, Charsadda, Khyber, Kohat districts and other adjacent areas. This would take 2 to 3 hours daily to reach the university. The digital pattern of education saved their time, money and energy.

Eighth, the Daily use of electronic devices, emails, and other social media software for attending video conferences, attempting papers through online examinations, and submission of assignments and presentations enabled both teachers and pupils to get acquainted with modern technology. They have also created Facebook and WhatsApp groups with each subject teacher through which they interact 24/7 for the exchange of files, lecture notes, subject contents related to their respective

subjects.

Ninth, another advantage of online classes observed is that it accommodated hundreds of students to attend the class with one teacher at the same time. In the physical classroom, it is very difficult to manage a class beyond the strength of 50 students. Similarly, the student's attendance in an online class may be taken with one single click on the save and download button. On the other hand, marking students' attendance in a physical class with normal strength consumes ten to fifteen minutes daily in each class from a teacher.

Tenth, this modern teaching and learning system proved beneficial in another way that it makes it easy for the students to grasp difficult ideas. They got red off the outdated concept of paying attention at any cost (required in physical class room), otherwise once they lost is missed forever. Now students have easy access to online content. They can also watch the recorded films again and again of the lectures delivered in their physical or mental absence. This significantly changed the traditional cheating culture.

Given that E-learning and digital distance education was already challenging area for the Pakistan education system. How has the pandemic situation affected E-learning, the teachers, the students and the quality of education?

Challenges to Online Education in Pakistan on the Basis of Findings of the Study

Conversion of physical classes into online has benefited both students and faculty members in terms of better learning, but still there are a large number of challenges that were faced by the students and faculty during the E-learning process. According to UNESCO as of April 144, 2020, 180 countries, including Pakistan, have closed nationwide schools which affected 1.5 billion learners. Pakistan's case was one of the worse because only one-third of the total population of Pakistan has broadband subscription till the end of 2019. With such alarming figures, Pakistan's education sector faced the formidable challenges given below, in the wake of the closure of the educational institutions and moving towards online medium.

1. First and foremost issue is the lack of quality of IT infrastructure, weak connectivity issue and frequent intervals of on/off during in online classes made the students to lose their interest in classes even having electricity and internet but poor quality deprived them in this regard.

2. The students belong to abusive households were having a shelter in the form of an educational institution. They remained at home for longer times due to lockdown faced the issue of domestic violence. As the increase in the unemployment ratio increased the ratio of violence. In Pakistan 28% of women between the age of 15-49 have fell pray to violence during pandemic. (National Commission of Women Status Report 2020)

3. The students at the university level were observed with more depression and anxiety due to detachment from society during the pandemic. Because they socialize more as compare to school and college students. Secondly, they were having more concern about the news of the virus on media.

4. Lack of training, preparation for digital/E-learning and sudden announcement of conversion to online classes remained another arduous task for every concern.

5. Another challenging task Infront of educational institutions was the conduct of online examinations and quality of assessments. It was observed that there was no proper mechanism for the process of student assessments. Sometimes the faculty would give three to four days to a student to submit their papers, observed in the Department of the Political Science University of Peshawar during terminal examinations at the graduate level. Consequently,

these online examinations promoted a cheating culture among the students.

6. Online education is an Elite practice and is likely to decrease literacy ratio of low-income families and rural areas.

7. Cultural obligations and quality of education in E-learning is another issue as a female cannot open video. This would create problems for teachers to check the availability of students in pursuit of an online class room.

8. Lack of acquisition of digital devices, especially with females belong to conservative families remained deprived of education during the pandemic. (Personal communication with students of Women University Mardan KPK)

9. Lack of physical activity has been found another problem. Lack of extracurricular and other recreational activities affected both the mental and physical health of students and teachers.

10. One female student from the English department from BS 2nd semester in the Women University of Mardan shared her experience. She said that they lost confidence level during the closure period and this online education halted their coordination process and particularly their personality development. All these are possible in physical classes.

11. Students from natural and numerical sciences found it difficult to grasp the ideas and concepts in theory as they needed laboratory and equipment for their study. This online education deprived them from practical and lab experiments.

12. Online education proved more worse for females as compared to males. One student from the department of the International Relations University of Peshawar belong to Chitral said that upper Chitral is not provided with internet facilities and as the hostels was closed in pandemic for them, they learned nothing and two semesters were just a waste of time and money.(Personal communication with the student of the International Relations University of Peshawar).

13. Most of the students from Mardan, Islamabad and Peshawar responded and complained about the time management of teachers. It was observed that teachers would not follow the time table and would take the classes at their personal convenience, sometimes at night.

14. This E-learning increased the level of lack of interest in books among the students, and they were obliged to stick to these electronic devices all the days waiting for classes and updates in their WhatsApp and Facebook groups. In the end, they were engaged more but educated less.

15. Another issue faced by the students was that of the learning environment at home. Frequent disturbance of kids and other family members proved the biggest hurdle in pursuit of their learning process.

16. Learners belonged to Poor families and low-income families were unable to buy expensive mobile internet packages which deprived them from taking classes.

17. Rigid rules of institutions for timely submission of their examination papers and assignments while students fell prey to un-scheduled electricity breakdowns and poor connectivity issues. The students confronted with such issues were adversely affected in terms of their examinations results.

18. Online classes give birth to another major issue, i.e., "relation barrier". According to psychologists, compared to google classroom, physical classroom environment and appearance have more influence over student's attention. A mere mobile or laptop screen at home environment relatively observed failed to keep students attentive.

19. Lack of discipline and order: students creating a disturbance in online classes were difficult to be controlled by the teachers concerned in case they would turn off the video option.

Status of Government Response

Majority of the governments have devised strategies to ensure quality education during the pandemic. The world had never met such a dramatic fate like this. Most of the states promptly responded to the Covid-19 in the field of education and diverted towards online education, and homeschooling was started officially. The responses of the government around the world are different in terms of income levels. Less than 25% of low-income countries currently provide some sort of distance education. Most of them are using TV and Radio. On the other hand, developed countries, having all the required resources and infrastructure, are successfully providing online education. (Pakistan Annual Policy Briefing 2020)

Education in Pakistan is the subject of both the federal and provincial governments. The federal government has of three types of main concerns about education. These are, to finance research and development in the country, accreditation, and development of curriculum. Moreover, this is mandatory for the government to provide free and compulsory education to all children from the age of 5 to 16 under article 25 (A) of the constitution of Pakistan 1973. The government of Pakistan initially adopted the policy of Brick and Mortar to solve correctly for sudden learning through the declaration of summer holidays and work from home. Later on, the government decided to pursue online education to which only universities responded positively but with weak infrastructure. While schools and colleges were ignored in an unprecedented manner.

However, the concerned authorities took the issue of learning losses seriously. Pakistan ministry of federal education and professional training announced a public policy naming, "Pakistan National Educational Response and Resilience plan for Corona Virus Disease 2019". The purpose of this policy is to cope with the impacts of covid-19 through the provision of strategies and policy innervations for the education sector in Pakistan. This policy is uniformly formulated for all the provinces including G.B Islamabad and AJK and for all the levels of education up to the higher secondary and for both public and private sector. The vision of this policy is to policy is firstly, to focus impacts of the pandemic on education in Pakistan, secondly, to strengthen public-private coordination and thirdly, to support the continuation of learning and protect the health and wellbeing of approximately 40 million students and two million teachers in Pakistan public school system.

To meet the financial issues of the education sector, the government also has approved a fiscal stimulus package of RS 1.2 trillion and supplementary grants of RS 100 billion for the residual emergency relief fund for mitigating the effect of covid-19 for the impoverished population.

Ministry of education and Professional Training (MEPT) initiated 28 development projects by Mid of October 2020. PKR 110 billion relief for people in electricity bills payment has already been waived off (Economist Intelligence Unit 2020).

The government also announced an 8 billion US dollars package to be spent on a multi-sectoral relief package to address the challenges during the dramatic experience of covid-19.

The government of Pakistan initiated a program naming "Digital Pakistan Initiative (DPI)" In order to ensure "access and connectivity". Its main objective is to reduce the learning losses through initiating a televised learning process at both the central and provincial levels. Apart from all these steps, this research study suggests some important recommendations based upon the observation of the failure of online education and learning losses in Pakistan.

Way Forward

Governments are the only mechanisms and organized structures through which adverse effects of covid-19 may be mitigated. Some significant policy recommendations are put forwarded by this study are given as: first of all, the government needs to prioritize elementary education, which is adversely affected during

the lockdown period. Though universities struggled a lot not to waste student's time but public sector elementary education due to the non-availability of any other alternative, faced the problem of loss in learning. Secondly, the closure of educational institutions made it necessary for educational institutions to bring some innovations in the century's old methodology of teaching and learning. Students need to be motivated to adopt the habit of self-study and to implement a variety of learning approaches from different technological platforms. Thirdly, the policymakers need to arrange special training programs for teachers to make animated videos in native languages to make lessons easy and understandable for students, especially at the school level.

Fourthly, the government can save the time of mature students at higher levels by dividing them into 3 or 4 different shifts in a single day for observing Corona SOPs and to continue learning on campuses. Fifth, we have discussed earlier in the challenges that students from low-income families were in dire need of financial support to meet the expanses of internet packages. Thus, it is recommended that the government should provide recorded lectures to national television and radio. In this way, the students at maximum level would be able to get benefits of learning through an affordable medium. Similarly, government can also provide USB only one per each public sector primary and elementary schools headmasters to ensure E-learning at the gross root level. Sixth, learning computer applications may be made compulsory at all levels along with other compulsory subjects like Pakistan Studies, Islamiyat, and English. Already existing faculty will also require some sort of training to learn the use of modern technology.

Seventh, one special recommendation is made for universities to take equity-based initiatives. As we observed the student's demonstrations in Islamabad in front of HEC against online exams and classes. The factor behind it is that every university inhibits students from diverse regions. For example, in Peshawar based universities, almost 30% of students belong to Erstwhile FATA where students missed the exams and classes because of load shedding and the non-availability of internet. Eighth, the provision of appropriate digital infrastructure like laptops, Android mobile phones, Power supply, and free access to the paid websites of educative values need to be ensured on an equitable basis.

Ninth, Female students of public sector universities were suffered a lot, especially those from far-flung and backward areas. The boarding students among them need not to send home rather they should to be accommodated by the government under the framework of necessary SOP's. Tenth, the method of evaluating the students through online examination give birth to cheating tendencies among the students. They would be given a free hand to submit their papers in one or two full days. This badly affected the quality of education. One professor of Islamic International University Islamabad suggested that under a live webcam video, the examination may be conducted. Though this method may raise the issue of privacy concerns or non-availability of connectivity, camera or power issue. The other possible option is the student's capacity can also be genuinely judged through viva exam.

Eleventh, the lock down resulted in great economic crises. Thus, it is difficult for parents to pay the semester fee of their children. All the public and private sector universities charged their students with routine fees. The students of engineering universities in Peshawar demonstrated once demanded during lockdown for providing them internet wireless devices (like Pakistan Telecommunication Company Limited (PTCL's) Evo 4G USB or any other wireless USB, s available in the market which able to provide internet), along with monthly packages from their fees to attend online classes.

Twelfth, all the higher education institutions in Pakistan need to appoint or hire the services of a focal person to coordinate and manage all the complications faced by students in terms of their disabilities in online classes. It

would be helpful in promoting the issues of despair, uneasiness and other worries of the students. Thirteenth, construction of buildings in remote and backward areas that are deprived of internet and electricity facilities for the students to continue their studies and minimize learning losses. This would be an alternative to commercial internet cafes where the learning environment is not conducive.

Fourteenth, to decentralize the governance of education as is required in a typical federal system for the provision of educational services at the grass-root level.

As a result of school closures in Pakistan, the heavy burden was tolerated by marginalized strata of society. Fifteenth, online education provided an opportunity for the students in developing countries like in Pakistan to acquire quality education in pattern of Western Europe and USA which decreased their worries about study abroad which is somehow a craze in Pakistani youth.

Conclusion

Summing up we can say that the education sector is confronted with extraordinary challenges and limitations throughout the period of closure of the institutions due to COVID-19, which resulted in the broadening of the pre-pandemic gaps in the education system in Pakistan. E-learning has further aggravated inaccessibility matter in education because majority areas of the country have no access to digital infrastructure, especially for students who belong to marginalized backgrounds. Online education may be taken as an opportunity rather than a challenge or issue if

the government and educational institutions eagerly adopt the suggested measures as the way forward in this article. "Education is no longer an option; it is the prescription for economic survival" (Hogan 2010).

Pakistan being a developing country couldn't meet the challenges of training and development of faculty, development of curriculum, allocation of funds, advancement in the field of software and improvement of quality in other educational infrastructure. For the solution of all these identified issues, we need a relentless in-depth research in the field of education across the country. Similarly, the female strata remained unconnected to online education due to cultural limitations in Pakistan as discussed in this article in detail.

Government needs to divert more focus towards E-learning in this age of technology. As it is not only learning through electronic devices rather it should be considered as a major social change as a target in the context of developing state. Another prerequisite is that the concerned authorities need to work on an inter-institutional competitive program in order to encourage, promote, nurture and apprise the online education to save the time of our young generation in future. This research study attempted to inform the concerned about Covid-19 catastrophic impacts on both pedagogic and scholastic activities and how this pandemic disturbed the whole academic calendar throughout Pakistan. Apart from challenges the significance of online education has also been deliberated as a requirement in this age of technology and global village.

References

Ahmad, K. (March 66, 2020). *Professor turns to online lectures as Sindh closes universities over coronavirus*. Arab News - Pakistan: https://arab.news/6z4zu

Andrabi, T., Daniels, B., & Das, J. (2021). Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005. *Journal of Human Resources*, 0520–10887R1. https://doi.org/10.3368/jhr.59.2.0520-10887r1

Centre for Economic Research in Pakistan. (CERP). (2020,April 166). Digital Education Response to Covid-19 in Pakistan. Centre for Economic Research in Pakistan (CERP): https://www.povertyactionlab.org/initiative-project/digital-education-response-covid-19-pakistan

Economist Intelligence Unit. (2020). The Inclusive Internet Index 2020. https://theinclusiveinternet.eiu.com/explore/countries/PK/

Ferguson, N. M., Laydon, D., Nedjati-Gilani, G., Imai, N., Ainslie, K., Beguelin, M., & Ghani, A. C. (2020). Report 9 - Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. London: Imperial College. https://www.preventionweb.net/publication/report-9-impact-non-pharmaceutical-interventions-npis-reduce-covid-19-mortality-and

Haris. (April 33, 2020) *online schooling: Possibilities and concerns*. https://indianexpress.com/article/opinion/coronavirus-pandemic-online-education-technology-6345621/

Hassaan, M. (March, 2020). Suspend the Online Classes and Refund the Fees (Pakistani Universities). https://www.change.org/p/higher-education-commission-hec-pakistan-suspend-the-online-classes-and-refund-the-fees-pakistani-universities

Hogan, R., & Kedrayate, A. (2010). E-learning: A survival strategy for developing countries. In Eleventh Annual Conference of the Sir Arthur Lewis Institute of Social and Economic Studies. University of the West Indies, Republic of Trinidad and Tobago.

Kermani, S. (2020). *Coronavirus: rumours, fear and rising Covid deaths in Pakistan*. BBC News, 2020. https://www.bbc.com/news/world-asia-52925286

Mehmood, A. (May 199, 2020). *COVID-19: Education in Pakistan gets mundane attention*. https://www.thenews.com.pk/print/660617-covid-19-education-in-pakistan-gets-mundane-attention.

Mukhtar, S. (2020). Pakistanis' mental health during the COVID-19. *Asian Journal of Psychiatry*, *51*, 102127. https://doi.org/10.1016/j.ajp.2020.102127

National Commission on the Status of Women. (2020). Gendered Impact and Implications of COVID-19 in Pakistan. Government of Pakistan, Ministry of Human Rights. Ministry of Human Rights. http://www.mohr.gov.pk/SiteImage/Misc/files/GenderedImpact.pdf

O'Malley, Sharon (July 122, 2017). Effective Teaching Online. https://www.insidehighered.com/digital-learning/article/2017/07/12/7-guidelines-effective-teaching-online

Pakistan Economic Survey. (2018-19). (Accessed at 25-09-2020) http://www.finance.gov.pk/survey_1920.html

Policy Brief: Education during COVID-19 and beyond. (August 2020). August 4g 2020), Tariq Banuri(CHAIRMAN, HEC) WHY ONLINE EDUCATION? (14-04-2020) https://www.hec.gov.pk/english/HECAnnouncements/Pages/Why-Online-Education.aspxtps://reliefweb.int/re

port/world/policy-briefeducation-during-covid-19-and-beyond-august-2020.

PTA Annual Report. (2019). PTA official website. (Accessed on 25-09-2020) https://www.pta.gov.pk/en/annual-reports

The Academia Magazine. (June 05, 2020). COVID-19: Pakistan's Education Sector Faces $2b In Losses. The Academia Magazine: https://academiamag.com/pakistans-education-sector-faces-2b-in-losses/

UN News. (2019). *'Health is a right, not a privilege' says WHO chief on World Health Day*. UN News,April 7l 2019. https://news.un.org/en/story/2019/04/1036221.

UNICEF. (2020). COVID-19 emergency preparedness and response WASH and infection prevention and control measures in schools. *UNICEF,* March 25h 2020. Accessed July 13y 2020. https://www.unicef.org/documents/

wash-and-infection-prevention-and-control-measures-schools.

World Health Organization. (2020a). Coronavirus (COVID-19) events as they happen. AccessedJuly 13y 2020. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen.

World Health Organization. (2020b). WHO coronavirus disease (COVID-19) dashboard. AccessedJuly 13y 2020. https://covid19.who.int/.

World Health Organization. (2019). novel coronavirus (2019-nCoV): strategic preparedness and response plan. February 3y 2020. Geneva: World Health Organization; 2020.

Zahra-Malik, M. (2020, July 144). The coronavirus effect on Pakistan's digital divide. BBC: https://www.bbc.com/worklife/article/20200713-the-coronavirus-effect-on-Pakistan's-digital-divide.