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Perceptions of Public University Students towards Online Classes during COVID-19 Pandemic in Bangladesh

Shyam Sundar Sarkar[1], Pranta Das[2], Mohammad Mahbubur Rahman[3*], M S Zobaer[4]

[1]Department of Social Welfare, Islamic University, Kushtia-7003, Bangladesh

[2]Department of Statistics, University of Dhaka, Dhaka-1000, Bangladesh

[3]Centre for People & Environ (CPE), Mohammadpur, Dhaka-1207, Bangladesh

[4]McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, TX 77030, USA

*** Correspondence:**
Mohammad Mahbubur Rahman
mmrahman.ju39@gmail.com

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Abstract

The severe disease outbreak COVID-19 pandemic impacted public health and safety and the educational systems worldwide. For fear of the further spread of diseases, most educational institutions, including Bangladesh, have postponed their face-to-face teaching. Therefore, this study explores public university student's perceptions towards online classes during the COVID-19 pandemic in Bangladesh. Data were collected among students of Islamic University, Kushtia, Bangladesh, through an online survey. The study followed both a qualitative and quantitative approach, where the survey technique was used as an instrument of data collection. Results showed that most students were facing difficulty participating in virtual classes and could not communicate with their friends correctly during online classes. They faced challenges in online schooling, and the majority of the students preferred conventional types of learning to virtual classes and did not understand the content of virtual classes easily. The study also explored that most students did not feel comfortable in online classes. Still, considering the present pandemic situation, they decided to participate in online classes to continue schooling. Besides, the study discovered that female students showed better real perceptions than male students regarding online classes, and urban students have more optimistic appreciation than rural students. Moreover, laptop or personal computer users showed more positive perceptions towards online education than mobile users. Furthermore, Broadband/ Wi-Fi users have more positive perceptions than mobile network users. These findings would be an essential guideline for governments, policymakers, technology developers, and university authorities for making better policy choices in the future.

1 Introduction

The planet is going through the most critical times in its history because of the widespread COVID-19 coronavirus pandemic (Dubey et al., 2020). The coronavirus diseases (COVID-19) emerged in the Chinese city named Wuhan in December 2019 and intensified worldwide. As the virus is very infectious, the world's communities are very concerned about the long-term effects of this disease (Rahman et al., 2020). In March 2020, the world health organization (WHO) had proclaimed

coronavirus as a global pandemic due to its worldwide spread in a short time (Bozkurt and Sharma, 2020). The widespread COVID-19 pandemic has affected not only human health but also the education system. Most of the educational institutions postponed their face-to-face classes for fear of further spreading the diseases. Students remained worried about their studies due to the closure of academic activities. Countries worldwide adopt different strategies to ensure education institutes are continuing classes for the students despite the pandemic. As educational institutions are closed, they concentrate on taking virtual classes and exams (Agarwal and Kaushik, 2020). As universities deal with many students, they give importance to online classes so that the virus cannot transmit among the students while face to face class arrangement's (Liguori and Winkler, 2020). However, in such a critical situation like a pandemic, the classes need to be continued to advance their studies. Many countries worldwide emphasize the online education method because it is an alternative instead of the traditional learning system. Calhoun et al. (2020) demonstrated that K-12 schools in Washington State, US started e-Learning education on 17th March 2020, and the University of Washington stopped all types of traditional direct classes because of COVID-19.

The 21st century is widely dependent on modern technology, and various educational institutions adopt this technology in the advancement of higher education. With modern communication technology development, Australia has already transferred higher education to online learning long ago (Stone, 2019). Georgia typically follows the traditional education system where students are used to taking part in face-to-face classes. Due to coronavirus's worldwide spread, Georgia suspended the conventional education system and recommended universities and colleges shift into online learning from traditional learning (Basilaia et al., 2020; Basilaia and Kvavadze, 2020). Like other Asian countries, India and China have also taken several techniques for continuing higher education. These countries give importance to online learning. Teachers and students of both countries started to participate in online learning through android phones and computer screens for continuing educational programs (Bao, 2020; Kapasia et al., 2020). The first COVID-19 patient was detected on 8th March 2020 in Bangladesh (Islam et al., 2020). COVID-19 can be a possible threat to Bangladesh on account of its population density. Considering all the growing health and social concerns and ensuring public health and social safety, the Government of Bangladesh (GoB) imposed public holidays for all the educational institutions, public and private organizations, industries, offices from 26th March 2020 (Shammi et al., 2020). According to the government decision, direct educational activities are stopped in Bangladesh due to the dreadful effect of the COVID-19 pandemic. Thinking of the present situation, the University Grants Commission (UGC) of Bangladesh allows public and private universities for taking online classes for continuing educational activities (Alamgir, 2020).

Undoubtedly, online learning is a good initiative for carrying on teaching and educational programs during this pandemic. But at the same time, students and teachers have to face some problems in adjusting online classes. As the online learning method is very new in our education system and we are not acquainted with the process, both students and teachers have to face difficulties during online classes. Developing countries like Bangladesh still follow traditional face-to-face classes while teachers delivering their lectures, students and teachers use virtual technology to run educational activities for the first time. Both teachers and students face many challenges to adopting the new online class and exam systems. The majority of the students come to universities for studying from rural areas. After declaring public holidays, students went back to their home, and now they have to participate in online classes and exams from remote regions. Most of the students use smartphones and laptops to take part in online courses and other educational activities. Internet cost is very high in Bangladesh, and most rural areas do not have high-speed internet connections like broadband internet service. Therefore, students rely on cellphone companies' internet service, which is very costly, and they struggle to buy expensive internet packages due to financial obstacles. Sometimes they cannot

get a proper internet connection due to poor networks that hamper online learning, and they have to search for suitable places for appropriate internet connection. This study aims to explore the perceptions of public university students during the COVID-19 pandemic in Bangladesh. The contribution of this study might be helpful for governments and policymakers for future interventions.

2 Methods

2.1 Study area and location of the study

Islamic University is one of the reputed and oldest public universities in Bangladesh, located in the south-western part of the country. The institution is placed in the middle of two districts named Kushtia and Jhenaidah. It is situated 24 km south of Kushtia city and 22 km north of Jhenaidah City. The university is renowned as the leading international center for theological, general, applied and engineering studies.

The researchers selected this university as a study area considering the following factors:

a) Location of the campus.
b) Combination of theological, general, applied and engineering studies.
c) Number of local and foreign students.
d) Reputation in postgraduate research and teaching.

2.2 Procedure

The Islamic University website showed that a total of 15,456 students are currently studying in the university. At first, the current study's required sample size was determined using the formula $n=N/(1+Nd^2)$ (Islam, 2007), wherein this study N=15,456; d=0.05, and n is the size of the sample needed. Therefore, using the formula mentioned above, the estimated sample size was 390. It was feasible to obtain the complete list of first, second, and third-year social welfare department's students of Islamic University. Then, fifty students were proportionally randomly selected from the list of these students. Then these fifty students were asked to give a list of twenty students they knew from the university other than the department of social welfare. After obtaining that list, ten students were randomly selected from each twenty students list, given by the students reached among the fifty students of the social welfare department. After doing this, a total of 408 students were randomly selected for the online survey. Therefore, an online Google form [1]was developed consisting of twenty questions. The Google form link was sent to these 408 randomly selected students through different social networking sites, and was requested to fill-up the form. Among these twenty questions, eight questions were regarding demographic characteristics such as age, sex, residence, the information on device and network used marital status, university name, and educational qualifications. Furthermore, among these eight questions, four questions were asked to compare the results using those characteristics. The rest four the questions had to verify whether the respondents are meeting the target population's characteristics. The final twelve questions, which address the student's perception towards online classes, were inspired by a similar study conducted by Borstorff and Lowe (2007).

2.3 Measurement

[1] Google Form. Link to the form: https://docs.google.com/forms/d/e/1FAIpQLSeNE480vdQ-jkQpm_nQa05QNQl8w-rqHtcA8k7d1xIczFpI0A/viewform

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To measure the perceptions toward online classes' twelve Likert scale items were employed. A five-point Likert art scale from strongly disagree (1) to strongly agree (5) was used to access online classes' perceptions. For testing the interpretation, respondents were interrogated to give their opinion about twelve objects. The twelve scales were obtained from the study of Borstorff and Lowe (2007).

2.4 Statistical Analysis

After several days of the link sent to the 408 students, 314 students responded to the Google form. Then after removing all the inadequacies from the data, complete data of 304 participants were obtained. After that, the reliability analysis was undertaken with the twelve Likert scale items to measure online class perception. At the same time, descriptive statistics of the twelve Likert scale items were also calculated. Statistical T-test was applied to glimpse if there is a remarkable dissimilarity in perception regarding student's background information. All of the statistical tests had been one-sided, and p- values <0.05 had been regarded noteworthy. The data had been analyzed by using software R version 4.0.2 and SPSS 25.

3 Results

3.1 Demographic characteristics of the participants

Among 304 participants, 66.1% were male, 33.9% were female, 10.5% were graduate students, and 89.5% were undergraduate students; 65.5% were from rural, and 34.5% were from urban areas. The respondents were aged between 18-25 years, and most of the respondents were aged 21. In the sample, 92.1% of the respondents mostly used mobile to join online classes, and 7.9% used laptops or personal computers. Furthermore, 78.9% of the respondents used the mobile network to join online courses, and 21.1% of the respondents used the broadband connection. A comprehensive presentation of the demographic characteristics is done in Table 1.

Table 1. Demographic characteristics of the students.

Variables	Percentage
Gender	
• Male	66.1%
• Female	33.9%
Residence	
• Rural	65.5%
• Urban	34.5%

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Level of educational qualification	
• Undergraduate students	89.5%
• Graduate students	10.5%
Device used	
• Mobile	34.22%
• Laptop/PC	37.83%
Network used	
• Mobile network	33.79%
• Broadband connection	37.20%

3.2 Reliability analysis of the Likert scale items

Reliability analysis was conducted among the 12 Likert scale items to measure perception toward online classes to know how much internal variability among the 12 items is genuinely reliable. Computing Cronbach's alpha conducted the reliability analysis. Chris Dewberry (2004) found that the standard approach level of the alpha coefficient is 0.70. A survey by Likert scale objects is unlikely to be calculating the same structures if the alpha value is less than 0.70. A study by Likert scale objects is unlikely to be calculating the same structures if the alpha value is less than 0.70. Cronbach's alpha computed from the 12 items used to measure perception towards online classes was found to be 0.892 (Table 2). Therefore, Cronbach's alpha indicates that the 12 items can measure the same construct; in this study, it is the students' perception toward online classes. Consequently, the module can be applied to assess public university students' attitudes towards online classes during the COVID-19 pandemic.

Table 2. Result of reliability analysis.

Cronbach's Alpha	No. of items
0.892	12

3.3 Descriptive statistics of the Likert scale items

One item addressed the difficulties of students accessing online classes. 39.8% of the students disagree that they do not face any trouble accessing online classes (Table 3). The second item showed students' communication problems with teachers, and communication difficulties with classmates, during online classes. 35.5 % of the respondents disagree that they had no problems communicating

 doi:10.20944/preprints202105.0516.v1

with teachers, while 31.6 % agree and 12.8% strongly disagree. Regarding communication with classmates, 42.8% of the students disagree with the statement that they had no difficulties communicating with classmates' while 26% agree, and 12.5% strongly disagree. Most of the students (30.9%) agree that they feel equally challenged in online classes as they thought in traditional classes, though 29.6 % disagree with that.

The fourth item measured students' attitudes toward their learning and class contents. 22.4% of the students agree that they think they learn equally in online classes, sitting in traditional classes, while most students (41.7%) disagree. 39.1% of the students disagree that the lecture contents are clearly understood, while 25.7% agree, and 19.1% are undecided. Only 30.3% of the students agree that they can take class notes like they used to take in traditional classes, while 43.1% disagree. Furthermore, 33.6% agree that online assignments were helpful, and 31.9% disagree.

47% of students think that the opportunity of participating in online classes is beneficial in the middle of a pandemic, while 14.5% disagree and 16.8% are undecided. Most students (47.3%) disagree that they have more flexibility in online classes than traditional classes. Moreover, most of the students agree that they will participate in all the online classes. They recommend their friends to participate in online classes, although some disagreements exist and some are undecided. Each Likert scale item's mean score is also calculated which refers to the student's strength of agreement or disagreement with the items.

Table 3. Descriptive statistics of the twelve Likert scale items.

Query	Strongly disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly agree (%)	Mean
I do not face any trouble in accessing online classes. (P1)	15.5	39.8	13.7	28	3	2.69
I had no problems communicating with my teacher when I have questions or concerns during an online class. (P2)	12.8	35.5	15.8	31.6	4.34	2.79
I never had any difficulties communicating with my classmates during online classes. (P3)	12.5	42.8	16.4	26	2.3	2.63
I feel that I am challenged in an online class environment as I am usually challenged in a traditional classroom. (P4)	8.9	29.6	24.3	30.9	6.3	2.96

 doi:10.20944/preprints202105.0516.v1

I think I learn just as much in an online class as I would sit in a traditional class. (P5)	15.5	41.7	16.8	22.4	3.6	2.57
The contents of the lecture are clearly understood in the online classes. (P6)	11.8	39.1	19.1	25.7	4.3	2.71
I can take class notes in online classes like I used to take in traditional classes. (P7)	10.5	43.1	12.8	30.3	3.3	2.73
Online assignments helped me understand the course contents. (P8)	10.5	31.9	20.1	33.6	3.9	2.88
I have more flexibility in online classes than in traditional classes. (P9)	19.1	47.3	15.8	15.5	2.3	2.35
The opportunity of participating in online classes is beneficial in this pandemic. (P10)	5.9	14.5	16.8	47	15.8	3.52
I will participate in all the online classes. (P11)	7.6	19.7	20.7	43.8	8.2	3.25
I will recommend my friends to participate in online classes. (P12)	4.3	12.2	24.3	49.3	9.9	3.48

Strongly Disagree=1, Disagree=2, Undecided=3, Agree=4, Strongly agree=5

3.4 Perceptions difference regarding demographic characteristics

Each respondent's perception score was calculated by summing over the score given to the twelve Likert scale items. To understand whether there is a significant difference in perception score regarding student's demographic information one-sided T-test had performed, assuming unequal population variance. The mean perception score of males and females is 33.53 and 36.42 in the sample (Table 4). The p-value associated with the variable gender is 0.004 since the p-value is less than 0.05. It can be stated that the mean perception score of female students is significantly higher than the mean perception score of male students.

 doi:10.20944/preprints202105.0516.v1

Regarding variable residence, the p-value associated with it is 0.04. Hence, the test says that the students staying in urban areas have a significantly higher mean perception score than the students staying in rural areas, as the p-value is less than 0.05. Also, the test between the students' device to access online classes and perception scores suggests that the students using laptops/PC in accessing online classes have a significantly higher mean perception score than the students using mobile phones in attending online classes. Also, between the students' variable network to take part in online classes and perception scores, the p-value associated is 0.008, suggesting that the students using the broadband connection in attending online classes have significantly high mean perception scores than the students using mobile network in attending online classes.

Table 4. T-test result specifying the connection between perception score and demographics.

Variable	**Perception Score** **Mean**	**Test statistic value (t)**	**P-value (One tail)**
1. Gender • Male (201) • Female (103)	33.53 36.42	-2.67	0.004
2. Residence • Rural (199) • Urban (105)	33.88 35.69	-1.73	0.04
3. Device used • Mobile (280) • Laptop/PC (24)	34.22 37.83	-1.87	0.03
4. Network used • Mobile network (240) • Broadband connection (64)	33.79 37.20	-2.45	0.008

4 Discussion

This study investigated public university student's perceptions towards online classes and its difference regarding student's gender, residence, the device used, and types of network used in accessing online schooling. The study was conducted among the students of Islamic University, Kushtia- Jhenaidah- 7003, and Bangladesh. As we know, the Bangladeshi educational system follows the traditional face-to-face learning method. But now, the whole educational activities are operating online during this covid-19 pandemic. The study demonstrated the perceptions and problems of online classes in the view of public university students.

The finding reveals that most students face difficulty accessing online classes and communicating with teachers and classmates during online classes. These findings are supported by some previous studies such as Kapasia et al. (2020), Subedi et al. (2020). Students faced problems accessing online classes due to the low speed of the internet. Sometimes, they disconnected from online class due to electricity and faced challenges communicating with teachers and classmates (Subedi et al., 2020). On the other hand, Blizak et al. (2020) mentioned that students faced difficulty participating in online classes due to the lack of gadgets. Students had to do substantial home assignments that need much time to do and created obstacles in attending online classes.

The online learning system is very new in developing countries like Bangladesh. According to this study's findings, most students say that they are not equally challenged in an online class and do not learn equally in online classes as they would be sitting in traditional classes. Most students say that class contents were not clearly understood and could not take class notes during the class time regarding class contents and class notes. Most of them also found online assignments not helpful. These findings are consistent with several previous studies such as Khalil et al. (2020), Alawamleh et al. (2020), Bisht et al. (2020). In an online learning system, most students face difficulty understanding class contents, lectures, and sometimes getting proper study materials. Participants also said that online classes could not create a natural classroom environment, and here students missed appropriate interaction with classmates and instructor (Bisht et al., 2020; Khalil et al., 2020). On the contrary, Alawamleh et al. (2020) and Blizak et al. (2020) found that most students preferred traditional direct classes in the classroom instead of virtual classes. They found that participants did not discern comfort in virtual classes, and participants argued that conventional classes are better than online classes.

We know that there is no alternative to online classes to conduct the eLearning process. But as a developing country, Bangladesh faces some problems in operating online classes. Considering all the issues, online classes are very fruitful for students in the pandemic. Our study's findings sketched that most students think that the opportunity to participate in online classes is beneficial. They will participate in all the online classes and recommend their friends to participate in online classes. This finding is similar to that from other studies. For instance, Subedi et al. (2020) investigated that online classes are time-consuming; anybody can take part in online classes at any time, which saves time and minimizes the risk of accidents. Students feel comfortable and flexible in online learning and can save more time and get enough time for studies (Khalil et al., 2020). The finding is also consistent with Kim et al. (2005). They mentioned that most students gave a positive opinion about online classes and online classes were very flexible. They would motivate their friends and peer groups in participating in online classes.

The study finding illustrates that female students show more positive perception than male students towards virtual classes learning in the difference in perception score. Our finding has similarities

with Bisht et al. (2020), which reveal that female students quickly adopted online learning and felt more flexible in eLearning education and thought online assignments were easier than male students. In the authors' opinion, some other factors may be associated with this surprising result. The finding from this study indicates that regarding residence, students residing in urban places have a more positive perception towards online classes than rural areas. In the authors' opinion, rural areas students are getting less access to the internet, which is the possible reason for less positive perception of the rural students than urban students. Our finding is similar to some previous studies. For example, Demuyakor (2020) found that the slow speed and high cost of internet package create disturbance in online learning. Most developing countries do not create modern facilities in the network system, and in rural areas, mobile networks and internet systems are very miserable. Due to a lack of internet and mobile network in rural regions, most learners cannot continue their virtual classes. Rural students do not have the proper capacity to buy mobile and laptop for online education, and most of the students have vital financial problems. Sometimes they cannot take part in online classes due to the lack of gadget and rickety signals of the internet and insufficiency of wireless internet connection (Xue et al., 2020). On the other hand, Agung et al. (2020) explained that internet connection and electricity supply are volatile in the village area, and students have to pay extra cost for internet connection. They are very anxious about their current situation.

The online class is the only medium to continue education in the middle of this pandemic situation. Overall, few students are getting benefitted through online classes, and most of them face some troubles. Online schooling has created discrimination between rural and urban students, between laptop/PC users and mobile phone users, between WIFI users and mobile network users. So our study suggests that we need to build a plan so for the students to get befitted through online classes and take necessary steps to reduce the discrimination created by online classes. In this regard, Agung et al. (2020) identified that mobile user student's face space and speed-related problems due to small RAM, and sometimes they cannot install useful software in mobile due to limited space. In the authors' opinion, laptops/PC screens are more significant than the mobile screen that helps clear viewing. This can be considered a plausible explanation of the result obtained regarding the variable type of device used in attending online classes.

This study indicates that students using broadband connections have a more positive perception towards online classes than the students using mobile networks to attend online learning. In this study, a mobile network refers to a 3G or 4G network, and broadband connection means Wi-Fi or such type of connection. In the authors ' opinion, a broadband or Wi-Fi internet connection is speedier than 3G/4G mobile network connection. This can be why students using the broadband connection in attending online classes have a more positive perception of online classes. However, this study only explored public university students' perceptions towards online classes during the covid-19 pandemic in one single University in Bangladesh. The study also did not explain the other factors that might influence online classes, such as students' psycho-social conditions during this pandemic, the student's financial needs, internet, and electricity problem, also did not discuss in which way the students can handle the situation but indirectly discussed those problems which need to be solved.

5 Conclusion

The online class is the only medium to continue education in the middle of this pandemic situation. Overall, few students are getting benefitted through online classes, and most of them face some troubles. Online schooling has created discrimination between rural and urban students, between laptop/PC users and mobile phone users, between WIFI users and mobile network users. So our study

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suggests that Government should build a plan so for the students to get befitted through online classes and take necessary steps to reduce the discrimination created by online classes.

6 Limitation

This study's primary restraint was that the survey was operated by only a small portion of participants in Islamic University, Kushtia-7003, Bangladesh. The study only explored public university students' perceptions towards online classes during the covid-19 pandemic in one single University in Bangladesh. The study also did not explain the other factors that might influence online classes, such as students' psycho-social conditions during this pandemic, the student's financial needs, internet, and electricity problem. The study did not show how to solve the issues and how the students can handle the situation.

5 Ethical issue

As there is no concrete ethical body in Bangladesh, we could not take the ethical approval for this study. However, before gathering data from the students, the research objectives were told to the respondent and given the guarantee of the confidentiality of their information. They were also informed that participation in this study is a voluntary contribution. He/she can quickly opt-out of the research, and this decision will not affect the students. Besides, any questions, which will help to identify the participant, were not asked.

6 Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

7 Author Contributions

SSS conceptualized the study, SSS and PD carried the literature review, coordinated data collection; PD analyzed the data using SPSS, SSS and PD drafted the manuscript. MMR revised the manuscript. MMR and MSZ supervised analysis and commented on the improvement of the manuscript. MMR & MSZ reviewed the manuscript and approved it.

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10 References

Agarwal, S., and Kaushik, J. S. (2020). Student's perception of online learning during COVID pandemic. The Indian Journal of Pediatrics, 87, 554-554.

Agung, A. S. N., Surtikanti, M. W., and Quinones, C. A. (2020). Students' Perception of Online Learning during COVID-19 Pandemic: A Case Study on the English Students of STKIP Pamane Talino. SOSHUM: Jurnal Sosial Dan Humaniora, 10(2), 225-235.

Alamgir, M. (2020, April 30). Ensure online classes: ministry, UGC to all universities. The Daily Star. https://www.thedailystar.net/online/news/ensure-online-classes-ministry-ugc-all-universities-1898335 [Accessed March 15, 2021].

Alawamleh, M., Al-Twait, L. M., and Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. Asian Education and Development Studies.

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies, 2(2), 113-115.

Basilaia, G., Kvavadze, D. (2020). Transition to online education in schools during a SARS-CoV-2 coronavirus (COVID-19) pandemic in Georgia. Pedagogical Research, 5(4).

Basilaia, G., Dgebuadze, M., Kantaria, M., and Chokhonelidze, G. (2020). Replacing the classic learning form at universities as an immediate response to the COVID-19 virus infection in Georgia. Int. J. Res. Appl. Sci. Eng. Technol, 8(3), 101-108.

Bisht, R. K., Jasola, S., and Bisht, I. P. (2020). Acceptability and challenges of online higher education in the era of COVID-19: a study of students' perspective. Asian Education and Development Studies.

Blizak, D., Blizak, S., Bouchenak, O., and Yahiaoui, K. (2020). Students' Perceptions Regarding the Abrupt Transition to Online Learning During the COVID-19 Pandemic: Case of Faculty of Chemistry and Hydrocarbons at the University of Boumerdes—Algeria. Journal of Chemical Education, 97(9), 2466-2471.

Borstorff, P. C., and Lowe, S. K. (2007). Student perceptions and opinions toward e-learning in the college environment. Academy of Educational Leadership Journal, 11(2).

Bozkurt, A., and Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. Asian Journal of Distance Education, 15(1), i-vi.

Calhoun, K. E., Yale, L. A., Whipple, M. E., Allen, S. M., Wood, D. E., and Tatum, R. P. (2020). The impact of COVID-19 on medical student surgical education: implementing extreme pandemic response measures in a widely distributed surgical clerkship experience. The American Journal of Surgery, 220(1), 44-47.

Dewberry, C. (2004). Statistical methods for organizational research: Theory and practice. Psychology Press.

Demuyakor, J. (2020). Coronavirus (COVID-19) and online learning in higher institutions of education: A survey of the perceptions of Ghanaian international students in China. Online Journal of Communication and Media Technologies, 10(3), e202018.

Dubey, S., Biswas, P., Ghosh, R., Chatterjee, S., Dubey, M. J., Chatterjee, S., ... and Lavie, C. J. (2020). Psychosocial impact of COVID-19. Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 14(5), 779-788.

Islam, M. N. (2007). An introduction to sampling methods: theory and applications. Book World, Islam, S. D. U., Bodrud-Doza, M., Khan, R. M., Haque, M. A., & Mamun, M. A. (2020). Exploring COVID-19 stress and its factors in Bangladesh: a perception-based study. Heliyon, 6(7), e04399. Dhaka.

Kapasia, N., Paul, P., Roy, A., Saha, J., Zaveri, A., Mallick, R., ... and Chouhan, P. (2020). Impact of lockdown on learning status of undergraduate and postgraduate students during COVID-19 pandemic in West Bengal, India. Children and Youth Services Review, 116, 105194.

Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., ... and Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: a qualitative study exploring medical students' perspectives. BMC medical education, 20(1), 1-10.

Kim, K. J., Liu, S., and Bonk, C. J. (2005). Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. The Internet and Higher Education, 8(4), 335-344.

Liguori, E., and Winkler, C. (2020). From Offline to Online: Challenges and Opportunities for Entrepreneurship Education Following the COVID-19 Pandemic. Entrepreneurship Education and Pedagogy, 3(4), 346–351. https://doi.org/10.1177/2515127420916738

Rahman, M. S., Peeri, N. C., Shrestha, N., Zaki, R., Haque, U., & Ab Hamid, S. H. (2020). Defending against the Novel Coronavirus (COVID-19) outbreak: How can the Internet of Things (IoT) help to save the world?. Health policy and technology.

Shammi, M., Bodrud-Doza, M., Islam, A. R. M. T., and Rahman, M. M. (2020). COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh. Heliyon, 6(5), e04063.

Stone, C. (2019). Online learning in Australian higher education: Opportunities, challenges and transformations. Student Success, 10(2), 1.

Subedi, S., Nayaju, S., Subedi, S., Shah, S. K., and Shah, J. M. (2020). Impact of E-learning during COVID-19 pandemic among nursing students and teachers of Nepal. International Journal of Science & Healthcare Research, 5(3), 68-76.

Xue, E., Li, J., and Xu, L. (2020). Online education action for defeating COVID-19 in China: An analysis of the system, mechanism and mode. Educational Philosophy and Theory, 1-13.

11 Supplementary Material

Attached as additional document.