Students in Online Classes

Problems and Solutions in the Perspective of Bangladesh

Bangladesh University of Engineering and Technology

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A report on
Students in Online Classes
Problems and Solutions in the Perspective of Bangladesh

Prepared for

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Forwarding Letter

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Subject: Letter of submission of a report on "Students in Online Classes: Problems and Solutions in the Perspective of Bangladesh."

Dear Sir and Madam,

With due respect, we would like to express our gratitude for assisting us in preparing a report on "Students in Online Classes: Problems and Solutions in the Perspective of Bangladesh." It has been a great privilege for us to make a report on one of the most widely discussed topics in Bangladesh currently.

The report is based on the opinions of the students who are currently undergoing online classes. After collecting data from the students, we have pointed out the problems they face in this regard. With the help of some recent articles, reports, surveys and websites we have also tried to offer some solutions that may be effective.

We are thankful to our course teachers for providing us with proper guidelines while making this report and apologize for any undesirable mistakes. We hope that this report will be helpful to improve the online learning system.

With regards,

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Summary

Online classes have now become relatively commonplace in the education sector of Bangladesh owing to the circumstances brought on by the COVID-19 global pandemic. Most institutions of the various levels of education in the country have attempted conducting some form of online education to help students advance through their academic calendars even if in the tiniest amount, and recover the country's education sector from the standstill it has been brought to by the closure imposed due to the pandemic. However, online classes do not come without their fair share of problems. In a survey conducted among students of all levels starting from Class-6 to University for this report, 98.4% of all responses included at least one type of inconvenience they faced during online classes, including high costs of internet connections, lack of network infrastructure, physical or mental health issues, frequent power losses and weather issues worsening the functionality of the infrastructure. According to a survey conducted by BioTED, when online classes first came into discussion among the University Grants Commission and various institutions, around June 2020, only 23% of the students expressed a preference for online classes, and only 55% had a satisfactory internet connection to attend online classes. According to DataReportal's Digital 2021 report, the internet penetration in Bangladesh stood at a meagre 28.8% indicating the alarming socioeconomic inequity among the student population. Even if everybody would have equal access to resources and no obstacles in attending classes, teachers and students complain that online classes are simply not as effective as traditional ones conducted in person. There is an obvious lack of interaction among teachers and learners, while practical classes and laboratory assessments are completely ineffective when conducted virtually. 85.7% of students responding to the survey for this study also reported that they do not find current evaluation processes such as online exams and assignments fair or accurate. A number of recommendations to solve these issues were also received from the students, including government funding to ensure proper internet and device access for students, providing recorded classes as an addition to live ones, and providing training to teachers through initiatives by the government or institutions. Some students even suggested suspending exams and continuing online with classes only, while around 20% of them even suggested completely suspending online education and continuing traditionally after the pandemic is over, deeming the current methods completely ineffective. To improve the quality of online classes, the largest portion of opinions for the most effective step in the process was the recommendation for government funding to ensure equal access to technology for all students.

1. Introduction

An online class is a class or course conducted through a digital learning management system, over the internet, where teachers and students can directly communicate with each other through live audio or video exchange. In the past online courses have mostly been limited to MOOCs (Massively Open Online Courses), such as those offered by companies edX, Udemy or Coursera. In the past two decades, many traditional universities in developed countries have also gradually adopted the online course system for long-distance learners from overseas. However, these have mostly been directed towards irregular students or those attending very specialized courses. In the context of Bangladesh, however, online classes have become relevant only with the spread of the COVID-19 Coronavirus. In fact, they have started to become mainstream worldwide, at all levels of education starting from pre-primary, as a replacement to regular classes, due to the restrictions on movement and lockdowns brought about by the global pandemic.

1.1 Background

The SARS-CoV-2 virus was confirmed to spread to Bangladesh in March 2020, with the first case being reported on March 8, 2020. The first coronavirus death was reported on March 18, and soon after, on March 23, a general lockdown was announced by the government. As the public holiday kept being extended due to no improvement in the public health situation, online classes officially first came into discussion around late May to early June 2020. An online survey was conducted by the University Grants Commission over April and May, and a letter on their findings from the survey was sent to the Ministry of Education on June 4, with the intention of forming an *Online Education Learning Policy* for the then situation and the days to come. The survey concluded that universities were not yet capable of conducting online classes due to the shortage of technical facilities and funds. Furthermore, four of the top-ranking public universities – University of Dhaka, Bangladesh University of Engineering and Technology (BUET), Jahangirnagar University, and University of Chittagong – reported that they were not intending to conduct online classes over the pandemic unless the government were to provide all the required facilities. The survey indicated that schools, colleges, and *madrasas* were even worse equipped for online education. Following a meeting on June 18 with the VCs of public universities, the UGC sought special budget allocation from the ministry. UGC Secretary Prof. Ferdous Zaman told the *Dhaka Tribune*: "The government agreed in principle to conduct online classes in public universities even as 38% of students do

not have smartphones or laptops." Finally, on June 25, the UGC asked all public universities to start academic activities over the internet from July. As quoted by *New Age,* UGC Chairman Kazi Shahidullah said, "The practical classes and examinations, however, will not be conducted through the online classes. After resuming normalcy, practical classes and examinations will be conducted." However, as the general holiday kept getting extended, many universities and lower-level institutions continued conducting classes and exams, with some even conducting practical classes virtually. Interviewing students from some of the top universities and colleges in Dhaka, it was also found that a large number of them had granted students promotion to the next semester or year of education based on the results of term finals conducted online. The HSC and equivalent exams of 2020 had to be cancelled and grades were assigned based on students' scores in the previous JSC and SSC public exams. The SSC and equivalent exams of 2021 faced the same fate and the possibility of conducting higher secondary level examinations in 2021 is still under scrutiny. The Ministry of Education, on multiple occasions, tried resuming academic activities of schools, colleges and universities on campus, every time resulting in the extension of the closure imposed. In late February, Education Minister Dipu Moni finally announced the reopening of all institutions up to the higher secondary level on March 30. Still, an abrupt rise in the number of COVID-19 cases and deaths caused by them clearly indicated the beginning of a second wave of the Coronavirus in Bangladesh. Nation-wide lockdown from April 4 was quickly imposed, nullifying all possibilities of resuming on-campus classes. As of late April 2021, online classes and examinations still continue being conducted in Bangladesh across a large number of institutions of all levels, while teachers, students and their guardians have not ceased to complain about all the hurdles involved in the process.

1.2 Online Classes: Views and Perspectives of the Students

All educational institutions in Bangladesh remain closed since March 17. However, educational institutions gradually leaned towards an online education system. It is obvious that as an instant change the system was imperfect and everybody has had a hard time adjusting to it. However, after almost a year, students have both positive and negative feelings towards it.

First of all, each and every student is happy that online classes are happening. The monotonous lives of students as they are in home quarantine for a lengthy period are diversified by online classes. It also creates a bridge between students and teachers to stay connected virtually. Online classes also help the students to lead a disciplined life although they are staying at home. Students also think that shifting to online learning was quite a wise decision. Otherwise, due to

this long-lasting pandemic, students would be lagging far behind. Those who were in their final semesters have already graduated and new students are also being admitted into many institutions.

However, the negative reviews about this system are quite a lot among the students than the positive ones. The main challenges are economic issues, network and electricity problems and health issues. From our survey, we also get a look at these problems individually. Almost 70% of the students have to spend 500-1000 taka per month for their internet connection and those who are in the rural area have to use mobile data. In that case, they need more than a thousand taka every month. Yet network issues are not solved. More than 50% of students face network issues or load shedding 1-3 times every day, and they have sometimes missed exams or deadlines due to this problem. Also, for some students, this thing is so severe that they can't even do their classes properly.

Aside from these problems, students are not quite satisfied with the structure of their online courses. More than 70% of students feel that the course structures followed in online are not good enough. Students also don't find the online evaluation process fair and accurate. That's why many students have suggested withholding online exams and continuing the classes only.

2. COVID-19 and the Current Condition of the Education System in Bangladesh

After the first confirmed case of COVID-19, the Ministry of Education and UGC announced the closure of all primary, secondary and tertiary educational institutions from 17 March until 30 March. From then onwards, there have been several more announcements of extension of the shutdown. Bangladesh, as a developing nation, continues to struggle in terms of education affordability. Many online platforms have sprung forth, but no standardized or well-regulated ones to cater to the general. Many of the software, namely Zoom, Facebook, Skype, MS Teams and others, require premium accounts, high-speed internet and may look complicated to use. Such mismanaged and unmitigated closure has had many repercussions, including restricted intellectual progress and the economic insufficiency of all people involved. A UNICEF survey shows that globally 14 countries have remained veritably closed from March 2020 to February 2021, of whom Bangladesh stands as the 3rd worst performer. Many experts opine that there is an endless scope of improvement.

2.1 Closure of Educational Institutes due to Lockdown

After March 23, 2020, all academic activities in the country were instructed by the government to close down activities on campus. Soon after, all board exams after March 2020, including PEC, JSC and HSC, were cancelled and students were handed an auto-promotion to the next class. The pandemic has also forced to shut down the halls, hostels, messes and other residential facilities provided to the students. Shadow education programs and coaching centers had to also shut down in the face of economic infeasibility and lack of students.

The government was unable to celebrate the annual 'Book Day', although all primary and secondary textbooks were made freely available online. Since most children in Bangladesh do not have access to the internet, the government has been broadcasting lessons on television for school students. Most of the universities are conducting online classes, even though not all of the feedback was positive. The only sector that turns out to be the least affected is the *Qawmi Madrasa* curriculum, which under a string of health restrictions has been allowed by the government to continue classes and take exams, since most of their institutions are residential in nature and are easy to control and monitor.

Following the closure for over a year, the schools have taken preparations to resume classes in a restrained manner from May 30 this year, although the pandemic shows no sign of being subdued. In its 47th annual report to the government, the UGC suggested formulating a policy to introduce a unified test for students vying for a seat at the private universities in Dhaka. On the other hand, admission tests in major public universities were halted until March of this year.

2.2 Conducting Online Classes with the Help of Technology

Due to the lockdown during the COVID-19 pandemic, our education system had become completely stagnant. But due to the easy availability of digital communication technologies in today's world, a new method of conducting classes soon came forward. For online classes, students and teachers need a suitable device with a reliable internet connection and an online platform or LMS (Learning Management System).

Devices needed for online classes:
- Laptops/Desktops
- Smartphones
- Tablets

The main requisites of these devices are they must have a clear front camera, supported 4G/LTE for good bandwidth, enough screen size for a good vision.

Platforms for online classes:

- **Zoom:** Zoom is a great platform for video communications. Because of its great sets of features, it is largely used for conducting live classes.

- **Google Meet:** Google Meet is Google's web meeting platform. Similar to zoom, it is also a widely used medium of online classes.

- **Google Classroom:** It is a free web platform with for creating, distributing and grading assignment. Its integration with google drive and google meet makes it a good LMS.

- **Microsoft Teams:** Microsoft Teams is a business commutation platform developed by Microsoft. However, because of its rich features and its integration other Microsoft services, many institutions have taken it as LMS.

- **Facebook Live and YouTube Live:** Facebook Live and YouTube Live are good for streaming. Because of easy access and low latency streaming with less bandwidth, some teachers choose these for taking live classes.

3. Online Classes in the Viewpoint of Bangladesh

Despite the best efforts of both students and authorities, online classes are not going smoothly. Bangladesh being a developing country, has a lack of proper infrastructure. According to our survey, 99.2% of the students face some sort of inconveniences during online classes.
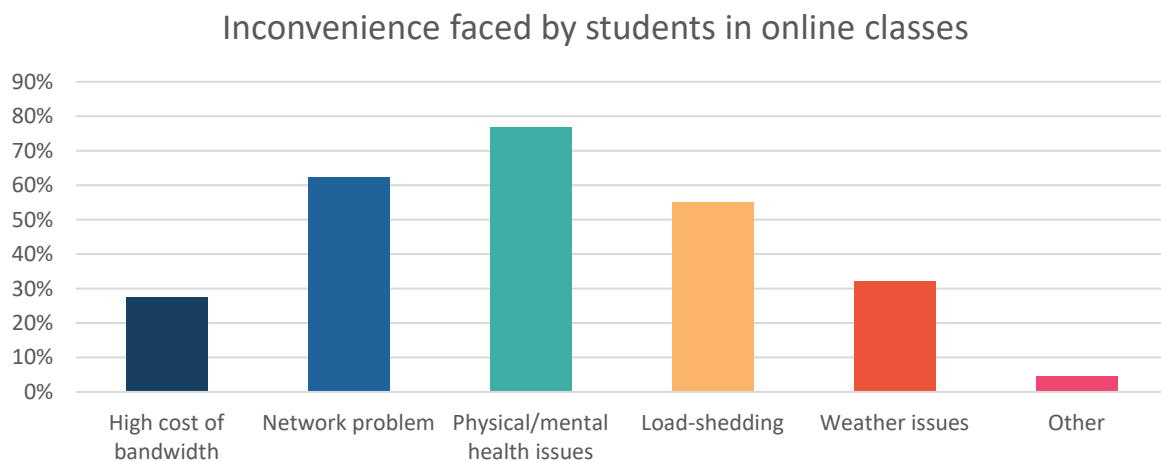
Figure-1: Inconvenience faced by students in online classes

3.1 Network Problems

The digitization process of Bangladesh is slow in comparison to other modern and developed countries. So, the infrastructure, as well as the socio-economic condition of Bangladesh, are not up to the mark to provide a smooth internet connection all over the country. But a good internet connection is a must to conduct online classes. There are some ways of providing internet connection in our country. But none of the ways is faultless.

- **Mobile Network:** More than 90% of internet users of Bangladesh are mobile internet users. There are 3 types of mobile internet connection 2G (50% users), 3G (38% users) and 4G (12% users) (differentiated with maximum bandwidth speed and network strength). 4G is the best among the three, but it was launched a few years ago and had coverage in only a few major areas. But, truly speaking, none of these networks is stable. Again, none of the networks can provide their maximum bandwidth speed. Moreover, the speed and stability largely vary to different mobile SIM operators.

- **Wireless/Broadband Network:** The network speed of wireless/broadband connection is more stable than a mobile network but not up to the mark. The ISP (Internet Service Provider) doesn't always provide the maximum bandwidth as they mention. Moreover, the network sometimes lags heavily because of poor bandwidth. Again, sometimes they stop providing connection due to server maintenance, update etc.

3.2 High Cost of Bandwidth

The current pandemic exposed many shortcomings of the country's mobile network and internet infrastructure, which cannot but profit off the helplessness of the masses. An average duration class may take 300 MB of data and if a student attends 3 classes per day, he will need to spend around 1 gigabyte of data, which is beyond the reach of many families in Bangladesh. 64.3% of our subjects had to make adjustments in order to overcome the expenses that came with the online transition, either by setting up new connections, increasing the internet cost or to some extent even changing their location of abode. 92.8% of our subjects spend over BDT 500 per month on internet expenses, and more than a third of them (39.8%) spend over BDT 1000 monthly.

SANEM estimated that 43.90% of the students' families could fall victim to poverty due to the pandemic, forcing 7.70 million additional students' families to enter poverty. Their survey back in June 2020 showed that 44.7% of the students could not attend online classes due to lack of

logistics. Moreover, mobile phone users will have to pay higher bills as supplementary duty is set to increase to 15% from the current 10% in the proposed budget for the fiscal year 2020-21. Students will now have to pay a 33.25% tax to the government for mobile phone use instead of the previous 15%. Therefore, to avail a service worth Tk 100, users will have to recharge Tk 133.25. Or, for each Tk 100 recharge, a user will get services worth Tk 75.05. The education minister has asked the mobile phone authorities to improve the quality and compromise the expense from their CSR funds. However, the companies are yet to respond to this call.

3.3 Unavailability of Smart Devices

Finance Minister AHM Mustafa Kamal, in his budget speech, pointed out that 40 million students are not being able to continue regular academic curriculums across Bangladesh.

According to a study by the Bangladesh Teachers' Network, around 40% of the students of Dhaka University are unable to buy devices and internet packages. The latest 2020 data of HIES (Household Income and Expenditure Survey) showed that around 12.70% of the poor families do not have a single mobile phone.

A survey by BioTED BD in June 2020 revealed the underlying fact of this strong dissent when they found only 55.3% of the students having access to a laptop, PC, or a tablet to attend an online class. An average proficient laptop cost ranges from 40 thousand taka to 70 thousand taka, which is far above the average income of a household. To make matters worse, laptops are not available in places other than large cities. Despite all of these, 46% of our subjects have admittedly managed newer devices solely for their online education. Only 27% of our participants have shown satisfaction regarding the current infrastructure.

3.4 Rural Area Problems

The rural areas of Bangladesh are not well developed. Electricity is a major concern. Load shedding is constant in these places. Power is gone for hours, especially in the working hours of the day. Moreover, the internet connection is terrible. There is no facility to use the broadband connection in most cases. And as for mobile data, the internet connection is very slow and unstable. It is not suitable for doing live classes. Also, paying for mobile data is a big burden for many rural folks.

At the pre-university level, most schools and colleges in the countryside are not conducting online classes as most of the teachers and students do not have the necessary devices or skills for classes to be conducted online. Hence, the students are falling behind compared to the ones in urban areas.

3.5 Load Shedding

According to the Power Development Board (PDB), our country's actual power generation capacity is 19,107 MW. But despite having surplus electricity, we are not getting an uninterrupted power supply. After a survey, it was found that the residents of Mohammadpur, Dhaka face load shedding every day for 20-60 minutes in the lockdown. The condition is even worse in other urban and rural areas. Thus, we are facing a lot of trouble in our online education system. According to our survey, 71% of the students face load shedding during online classes every day. Students face many inconveniences attending online classes due to this frequent load shedding. Also, according to our survey, 82% of the students use broadband as their main mode of internet connection, which becomes useless during load shedding and students have to spend extra money to buy mobile data for that time. Moreover, sometimes due to bad weather, transformers get destroyed, connection wires get torn. These take a long time to fix. Thus, power is gone for hours, and so is the wi-fi. Our survey shows that 32.3% of the students have faced difficulties attending online classes due to load shedding during bad weather.

3.6 Socioeconomic Disparity

School students, especially those who study in government institutions, are among the worst-hit sections of our society by COVID-19. The lockdown triggered by the pandemic has not just left school education haywire but also made it costly and out of reach of children from poorer families. The kids who study in government schools are likely to suffer in many ways due to the emerging situation. The sad part is that the government's education department does not yet have a policy on this.

Online education, although being a well-intentioned move, is bound to widen the digital divide in society. Poor and middle-class parents already hit by income loss have been forced to cough up extra money on their kids' smartphones, tabs, laptops etc. According to our survey, almost 80% of students had to make some adjustments in order to take online classes.

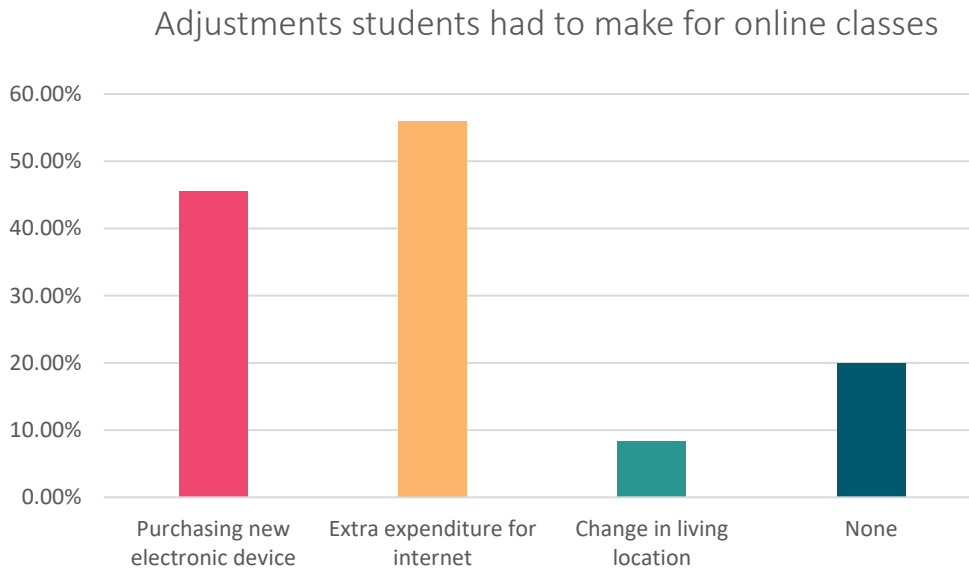Adjustments students had to make for online classes

Figure-2: Adjustments students had to make for online classes

Moreover, kids from these families are unable to catch up with online classes. A major reason for the poor efficacy of online classes is the lack of concentration power of students in lower classes and not-so-great technical quality of apps that connect teachers and students—either audio or video is of poor quality with frequent interruptions in internet connectivity. Many students from rural areas, in fact, parents too, are still to believe that smartphones can also be tools of education.

3.7 Fairness of Evaluations

Unlike the traditional in-class exams, there are many obstacles in conducting a fair evaluation online. Online exams limit the capacity for standard forms of educator observation. A typical class in our country has 30-60 students. Teachers cannot monitor every student simultaneously in a video call with a tiny computer screen, which leaves the students a big chance of cheating in various ways. During an online exam, a student can open the browser, search his question on Google and copy the answer, and the teacher will have no way of knowing or proving that.

Almost every class has some group chats among students on Messenger, WhatsApp, Discord, or other platforms. They can discuss answers among themselves during an exam which ruins the entire purpose of individual evaluation. Another problem unique to online classes is hiring a third party to take an exam by proxy. Students can ask a senior student or a friend from another class or other institution and, if needed, pay a reasonable fee for answering the questions for them in the exam. This is mainly seen at the university level. According to our survey, 86% of the students themselves think that online evaluation is not fair.

4. Impacts of Online Classes on Students

It has been over a year since the lockdown began. Almost all of the universities and many schools and colleges have been trying their best to continue their classes over the internet, though not all feedbacks were positive. Students have been facing many issues attending classes online. These have been impacting the students physically, mentally and academically.

4.1 Impacts on Physical Health

Students spend a significant amount of time in their online classes, about 4-7 hours daily. This huge amount of screen time leads to unavoidable physical health issues like:

- **Stress on the eyes:** One of the most notable concerns of online classes is eye strain. The more hours spent in front of the screen, the more likely it is that intense eye strain will occur. This is partly due to the blue light generated by the computer or phone screen. This eventually leads to decreasing in eyesight, myopia, dry eye syndrome or computer vision syndrome. Doctors recommend taking a break after every 30 minutes of screen time. However, this is not an option for most of the students. Because after one class, they often have another mandatory class right after, leaving no time to give the eyes a break.

- **Poor Ergonomics:** Poor ergonomics is another concern of online classes. Most of the students use regular tables and chairs, which is not good for long time computer use. They also do not maintain a good posture. They sit in the same spot for a long period of time and do not stretch their muscles. All these contribute to back pain, neck or shoulder pain, rounded shoulders, Fibromyalgia and other musculoskeletal disorders.

- **Overuse of headphones:** A large number of students use headphones during online classes. It blocks the air passage in the ear canals and creates pressure on the eardrums. Using headphones for hours causes dizziness, hearing loss, ear infections, ear pain, NIHL (Noise-Included Hearing Loss), Tinnitus and headache.

- **Sleep deprivation:** Insomnia symptoms are common in students taking regular online classes. Staring at the screen for a long time causes less production of melatonin, a hormone responsible for sleepiness. Thus, it disrupts the sleep cycle of a person. According to a study, 87.4% of the students who had more than 2 hours of screen time had difficulties falling asleep at night.

4.2 Impacts on Mental Health

The mental and emotional pressures experienced by students can lower immunity and thus cause deteriorated physical health. Online education can affect mental health in several ways:

- **Anxiety and stress:** As students are not accustomed to the online education system yet, it is quite hard for them to keep progress at the same rate as before. Therefore, students often get worried about their studies and progress. These thoughts and constant anxiety leave a deep scar on the mental health of any child, teenager or young adult.

- **Staying focused:** Staring at a fixed point on a screen for hours can lead to very distracting and uncomfortable tension headaches. The temptation to surf social media during online lessons is also another reason for losing focus. In a normal class, a walk in the hallway or a little chat with friends helped students regain concentration. But in online classes, students often force themselves to stay focused in the class against their will.

- **Camera anxiety:** Online classes have increased the pressure of looking presentable at all times. Some students tend to be hyper-aware of their appearance on camera. Although this concern differs from person to person, for some students, this may lead to depression, lack of confidence and many other problems.

- **Lack of social interaction:** Shifting classrooms to the virtual world has impacted students' social life the most. Online classes don't offer the scope to share feelings with friends, and so some students may feel that they are losing bonds with their friends. Students also don't get the attention from teachers that they used to get in the classroom.

- **Virtual Learning Fatigue:** Spending a significant amount of time online can fatigue students. Part of the reason a day full of video interactions is so mentally draining is that human brains cannot process information in the way it's accustomed to. In face-to-face interactions, there are several nonverbal cues, such as body language, voice tone, or facial expressions. When it's difficult to pick up on these cues, the brain must work harder to interpret the information it's receiving, causing extra mental fatigue.

4.3 Impacts on Academics and Learning

A change in the medium of conducting courses affects not only the physical and mental health of learners but also their overall experience and quality of learning, along with the integrity of their academics. The following factors come into play here:

- **Lack of consistency in course structure:** A traditional classroom setup has a fixed structure consisting of a learning environment, evaluation methods, and a system of rewards and penalties. Students in most educational institutions have reported a lack of consistency in the medium of conducting their classes and evaluations across various courses or subjects. Learners are often required to go out of their way and use different platforms to attend classes or exams than the one officially fixed by their institutions. 19.3% of the students surveyed even responded that their institution did not have a fixed platform or LMS at all, making it more difficult for many learners to follow the structures and requirements of courses.

- **Unreliability and unfairness in evaluations:** Conducting evaluations, particularly exams, online is significantly different from conducting them in person. The online education experience varies too much from student to student, depending on their socioeconomic background and geographical location, causing discrepancies in academic results. The limited scope of invigilation during evaluations further weakens the authenticity of these. Due to the reduced authenticity of academic results, universities, particularly foreign ones are unwilling to trust the standard of evaluation at the high school level or the auto-promotion results granted for canceled public examinations based on previous examinations. Following this trend, employers are also reluctant to trust the authenticity of the grades from university semesters that were conducted online. Thus, due to the problems brought on by online classes and assessments, the academic and professional careers of the students are directly affected.

- **Poor growth of practical and professional skills:** Due to a blatant lack in the element of interactivity in online classes, it is just exceptionally difficult to conduct sessionals or laboratory classes online. This greatly affects students in technical disciplines whose professional abilities and careers largely depend on practical skills that cannot be effectively taught without proper interaction in person with technical equipment.

5. Conclusion

As a developing economy which is poorly connected compared to its neighbors and the rest of the world, Bangladesh is quite obviously not very ideally suited for the conduction of online classes as a mainstream mode of education. A large portion of the country's student body still lacks the resources needed to participate in academics through the internet.

With no set date for the return to physical classrooms, it is up to students and teachers to make the best of online learning, and it is up to authorities to make the path for them as devoid of hassles as possible. Learning online is different from learning in a face-to-face setting, and for students, it is important to think about their own interests, needs and goals before committing themselves to the virtual classroom experience. Several factors come into play, such as the time they have at disposal, their comfort levels and access to technology, high-speed internet, the platform being used by the institution, etc.

The pandemic has shown us that online learning is going to be part of our reality. The opinions of learners suggest that only through the utmost cooperation between them, their teachers, authorities of the educational institutions and government bodies, it will be possible to optimize the allocation of resources and maintenance of standards with the limited resources available.

6. Recommendations

Adopting a new mode of education is quite a challenge for everyone. The system is not perfect yet, and because of the pandemic and economic condition of the country, there are more challenges to face than usual. According to our survey, students feel that these changes should be brought in to improve the quality and accessibility of online classes-
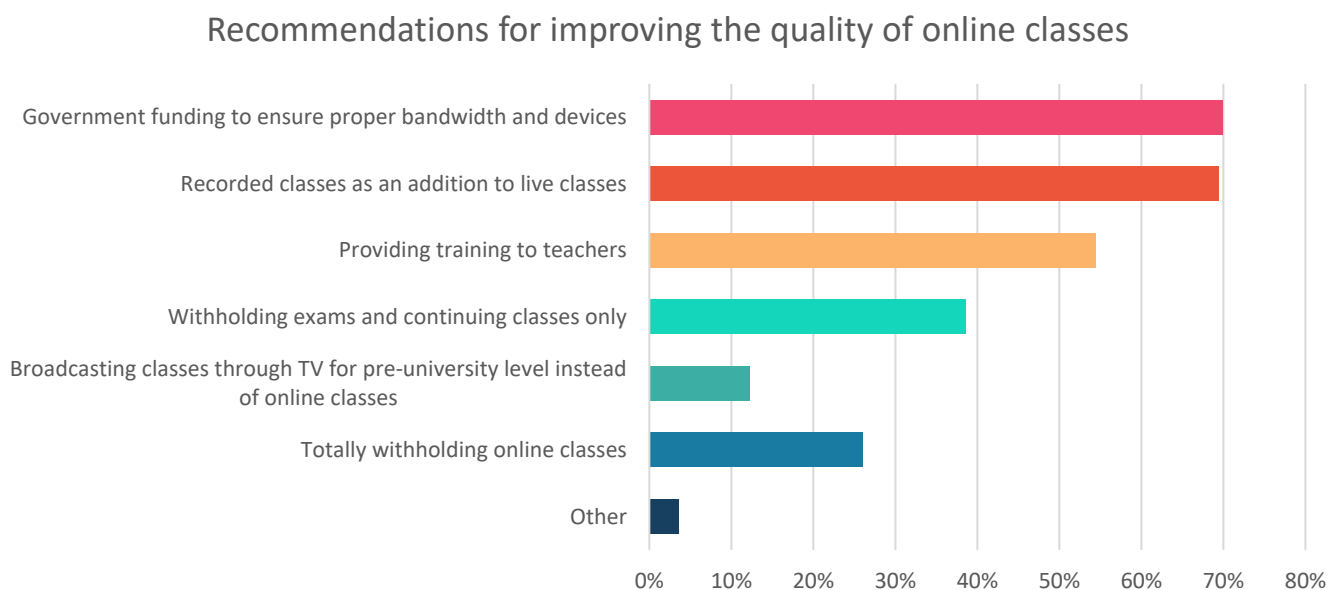

Figure-3: Recommendations for improving the quality of online classes

6.1 Suitable Rules for Conducting Online Classes:

Some suitable protocols should be maintained in order to make online classes convenient for both the student and teachers. Such as-

- The teacher should maintain a fixed LMS for his/her course like Google Classroom or Microsoft Teams.

- The teacher should provide lecture materials like pdf, presentations, class recordings etc. to the class so that if some students miss the class, they can go through these later. Hence, online storage services like Google Drive or OneDrive can be used.

- The teachers should be flexible about giving attendance. If a student can show a valid reason for his/her absence, the teachers may consider him/her.

- Teachers should give a reasonable submission time for online evaluations or assignments. If someone gets infected by covid and cannot attend online exams, the authority should take his/her exams later separately, at a convenient time.

6.2 Importance on Students' Opinions

Taking students' opinion is necessary for any kind of education system. But in online systems, it is a prime need. In the online education system, there lie many issues and problems for the students. So, the teachers and authority should stay in touch with every student. They should encourage students to express their problems and opinions freely and maintain privacy. Many students face different financial, residential, and family problems to maintain online classes regularly. So, there must be an open and confidential section where students can freely express their problems. Every student can have their own opinions and resolutions of the teaching style, teaching duration, and evaluation methods. So, the authority should maintain privacy and collect information from the students and do what is necessary for the betterment of the students.

6.3 Ensuring Proper Bandwidth and Devices for all Students

Technical issues such as internet connectivity, packet loss and latency can hinder successful online teaching. In this regard, Students might use a wired internet connection (Ethernet LAN) to improve their internet connectivity and reduce technical issues. However, not all students have consistent access to high-speed internet, so it is important to provide low bandwidth and asynchronous learning materials and activities to mitigate connectivity issues. Alternatives of

live teaching such as pre-recorded materials with a discussion-board activity that do not require high levels of internet connectivity should be considered.

However, if live teaching activities are unavoidable, these techniques can be applied to reduce the required bandwidth:

- Having fewer people per meeting
- Decreasing video quality
- Turning off the participant video feed
- Limiting video and application sharing

Also, every institution must ensure that every student has a proper device for online classes. If any student is unable to get one, the institution should help him in this regard.

6.4 Adaptation of Course Content to an Online System

Online and offline classes are not the same. Taking online classes the same way as offline ones is not effective. Online classes should not be just a video of a person talking in front of a blackboard or just reading a PDF. Online classes should be dynamic. Making multimedia presentations, annotating on the screen with a graphics tablet, using simulation software etc. can make the lectures interesting, more effective and easier to follow. Teachers should try to make their classes more interactive. Otherwise, it will be just a one-sided lecture and students will eventually lose interest in the class and get distracted with other things.

Teachers should also care about their time management. Unlike offline in-person classes, one cannot stay concentrated while staring at a computer screen for long. The length of an online class should not exceed 30-40 minutes. Teachers should keep that in mind and plan their lectures accordingly. If they have to take a longer class, they can try giving a 5-minute break in the middle. Also, there should be a break between back-to-back classes for the eyes to rest.

6.5 Devising a Dependable Evaluation System:

As any assuring alternatives to written tests are yet to be discovered, many standardized tests are yet to find any alternative to onsite written exams. Nonetheless, as universities have more flexibility with regards to their evaluation methods and so, many cost-effective and efficient methods of virtual examination can be put in place to compensate for traditional methods, as well as tackling plagiarism. Schools and universities can consider a system comprising oral viva, assignments with deadlines, open-book written exams, presentations and multiple-choice questions. In addition, institutions can also benefit from using LMS, Google Tools to keep

track of grades and exam tracking software such as ExamSoft to monitor any dishonesty. The UGC must innovate a method to make these cost-effective for everyone.

6.6 Providing Training and Devices to Teachers

In the survey conducted for this report, 55.1% of all students recommended providing training to teachers through initiatives by the Government or their respective institutions as a way to improve the quality of online education in this pandemic. This was also deemed the most effective step for improving quality by 11.1% of the responders. To accomplish this vital requirement, the following steps may be considered:

- **Arrangement of Broadcasts by Teachers' Training Colleges:** In a 2011 study conducted by Mohammad Ataur Rahman, on a scale of 0 to 4, the average level of IT skills of teacher educators at the TTC, Rajshahi was found to be only 2.36. Thus, it is necessary to train the teacher educators first and then arrange national broadcast programs for teachers of all levels to train them in the use of digital devices, digital learning management and communication apps.

- **Providing Teachers with Devices**: According to the 8th National Pay Scale, a teacher earns an average of 25,000 taka monthly, which is abysmally low considering that even a very basic personal computer may cost around 30,000 taka. Therefore, it is vital to provide teachers with devices for conducting classes under a government initiative. Tablet computers may be the most practical choice considering both utility and affordability.

- **Recruitment of Additional IT Staff to Assist Teachers**: As the education sector has become massively dependent on IT, recruiting some additional IT staff may help guide teachers unfamiliar with this newer technology by reallocating expenditure from utility costs that are saved due to conducting classes remotely. Maintenance workers in the technology sector are also permitted by law enforcement to offer emergency services during lockdowns following the suggested health and safety regulations.

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Glossary

COVID-19: Coronavirus disease 2019 (COVID-19), also known as the coronavirus or COVID, is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first known case was identified in Wuhan, China, in December 2019. The disease has since spread worldwide, leading to an ongoing pandemic.

Broadband: Broadband is wide bandwidth data transmission which transports multiple signals and traffic types. The medium can be coaxial cable, optical fiber, radio or twisted pair.

LMS: A learning management system (LMS) is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.

MOOC: A Massive Open Online Course (MOOC) is an online course aimed at unlimited participation and open access via the web. MOOCs are a widely researched development in distance education first introduced in 2008, that emerged as a popular mode of learning in 2012.

Fibromyalgia: Fibromyalgia is a disorder characterized by widespread musculoskeletal pain accompanied by fatigue, sleep, memory and mood issues.

NIHL: Noise-induced hearing loss (NIHL) is hearing impairment resulting from exposure to loud sound. People may have a loss of perception of a narrow range of frequencies or impaired perception of sound including sensitivity to sound or ringing in the ears.

UGC: The University Grants Commission (UGC) of Bangladesh is the statutory apex body in the field of higher education in Bangladesh. The primary objectives of the UGC are to supervise, maintain, promote, and coordinate university education.

PDF: The Portable Document Format (PDF) is a file format for storing documents on a computer. Adobe Inc. created it in 1993 to make it easier to exchange documents. PDF is often used to make documents print-ready by preventing any change in appearance when transferred to a different computer. PDF documents can have stylized text and images in them.

Appendix

Please answer these questions. Put a tick beside your answer.

1. What type of area are you currently living in?
   ◯ Urban (Dhaka)   ◯ Urban (Other)   ◯ Rural (Not remote)   ◯ Remote/Island

2. Did you have to make any adjustment to your current amenities? Select as many apply.
   ☐ Purchasing new electronic device   ☐ Extra expenditure for internet service
   ☐ Change in living location   ☐ None

3. Are you satisfied with the structure of online courses conducted by your institution?
   ◯ Yes   ◯ No

4. What sort of inconveniences do you face during online classes? Select as many apply.
   ☐ High cost of bandwidth ☐ Lack of network infrastructure ☐ Physical/mental health issues
   ☐ Load-shedding   ☐Weather issues   ☐ Other   ☐ None

5. How often do you lose your network connection / electricity during online classes?
   ◯ (Almost) never   ◯1-3 times per day   ◯ 3-5 times per day   ◯ More than 5 times a day

6. What is your main mode of internet connection?
   ◯ Wired Broadband (with or without Wi-Fi)   ◯ WiMAX Broadband   ◯ Mobile Data

7. How much do you usually spend per month on your internet connection?
   ◯ Below 500 Taka   ◯ 500 - 700 Taka   ◯ 700 - 1000 Taka   ◯ Above 1000 Taka

8. Does your institution have a fixed platform (Learning Management System) for online classes and submissions?
   ◯ Yes   ◯ No

9. Have you ever missed an exam or a deadline due to issues with connection, infrastructure, or logistics?
   ◯ Yes, once or a few times   ◯ Yes, many times   ◯ No

10. Do you find current evaluation processes (exams, assignments) fair and accurate?
    ◯ Yes   ◯ No

11. Do you feel that your online education is an economic burden on your family?
    ◯ Yes   ◯ No

12. Which of the following do you recommend for improving the quality of online education during this pandemic? Select one or more.
    ☐ Government funding to ensure proper bandwidth and devices for all students
    ☐ Recorded classes as an addition to live classes
    ☐ Providing training to teachers through govt. / institution's initiative
    ☐ Withholding exams and continuing online classes only
    ☐ Broadcasting classes through television / radio for pre-University students instead of online
    ☐ Totally withholding online classes and resuming offline post-pandemic
    ☐ Other