

Covid-19: Digital Divide and its Impact on the Educational Lives of the Secondary Students in Bangladesh

By

**Audrika Eshna Purbasha
19262007**

A thesis submitted to the Department of BRAC Institute of Governance and Development in partial fulfillment of the requirements for the degree of Master of Development Studies (MDS)

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Declaration

It is hereby declared that

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2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
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Student's Full Name & Signature:



Audrika Eshna Purbasha

19262007

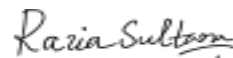
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The thesis titled “Covid-19: Digital divide and its impact on the educational lives of the secondary students in Bangladesh” submitted by

1. Audrika Eshna Purbasha (19262007) of Fall Semester of 2021 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Master of Development Studies on [].

Examining Committee:

Supervisor:



(Member)

Dr. Razia Sultana
Associate Research Fellow
BIGD, Brac University

Program Coordinator:



(Member)

Mohammad Sirajul Islam
Coordinator (Academic & Training Program)
BIGD, Brac University

External Expert Examiner:

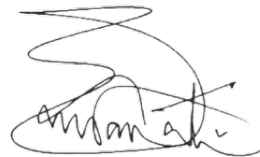
(Member)



Dr. Selim Reza
Head of Academic Programs
BIGD, Brac University

Departmental Head:

(Chair)



Dr. Imran Matin
Executive Director
BIGD, Brac University

Abstract:

Ever since the widespread use of ICT, the digital divide has been prominent across different socioeconomic groups and gender in Bangladesh (Zahan, 2021). Moreover, the digital platform being the only medium to study during the school closure period, many students have been found to have a hampered educational life. A recent study jointly conducted by the PPRC and BIGD found that 19 percent of primary students and 25 percent of secondary students are at learning loss risk (Rahman & Matin, 2021). Nevertheless, several studies have been conducted which targeted to understand the child marriage and involvement in paid work as contributing factors to impacting educational lives of secondary students including learning loss risk but not much light had been shed on the in-depth investigation of the relation of the digital divide and the educational lives of the secondary students. Therefore, the purpose of this study is to explore how DAD (digital access divide) and DCD (digital capability divide) are impacting the educational lives of secondary school students during the school closure phase of the Covid-19 pandemic. Using a qualitative case study method this research conducted 10 in-depth interviews (IDI) with the variation of rural-urban and male-female secondary school students from Mymensingh, Sylhet, and Dhaka divisions. Two KII were also conducted where the Key Informants were from academic and government policy levels. The initial observations suggest that most of the secondary school students of both rural and urban areas do not have access to digital devices (smartphones, computers, etc.) to be used for educational purposes. Besides, female students are more comfortable with non-interactive (TV, radio) platforms while male students prefer interactive platforms. Another observation suggested that students are now finding it difficult to understand their lessons after reopening of the school. Figuring out any existing gap would thereby aid in future policy implications and appropriate interventions.

Keywords: digital divide; digital access; digital capability; educational lives; secondary students; digital device

Dedication:

To my family, especially my Mother, whose contributions can never be explained in words.

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List of Acronyms

BIGD- BRAC Institute of Governance and Development

DAD- Digital Access Divide

DCD- Digital Capability Divide

GoB- Government of Bangladesh

GAGE- Gender & Adolescence: Global Evidence

HHs- Households

HIES- Household Income and Expenditure Survey

ICT- Information and Communications Technology

NGO- Non- Governmental Organization

PPRC- Power and Participation Research Centre

SDGs- Sustainable Development Goals

Chapter 1: Introduction

1.1 Background

The Covid-19 pandemic seemed to be a crucial turning point for the entire World. Although the pandemic did highlight the sheer necessity of the digital economy, it also unveiled the various types of digital divides that are found to be existing between the societies in developed and developing countries (Tadesse and Muluye 2020). Although the virus is neither gendered nor political on its own it did uncover several issues in regard to social inclusion, digital access, and gender equity (Kasinathan and Ranganathan 2020). For example, if certain societies lack equitable access to digital resources and tools that can help/ aid them to achieve a stable online connection, digitization will obviously not be able to bring fruitful results.

Moreover, many subdivisions, such as gendered and socio-economic sub-divisions occur across societal groups, which results in a digital gap or divide between these subdivisions and causes the underprivileged groups to be socially excluded.

One such aspect where the digital divide has uncovered utter social exclusion is education, particularly in developing countries and countries where there is a pre-existing digital divide. Education is one of the most important facets in the lives of the people of Bangladesh and the history of education in Bangladesh dates back several years, with public and private schools being foremost in the history books. Although education is a vital aspect of people in Bangladesh, the fact remains that the education system in the country is not competitive when compared to those systems present at the international level. Lack of a unified curriculum and skilled teachers are still being hindrances in achieving the education goal for the country.

Moreover, Bangladesh also constitutes a population that largely depends on public schools, which in most cases are overloaded with students and not all of them meet the standards depicted by the nation's private schools (Mustary, 2021).

To bring more fruitful results and improve the efficacy of the education system, Bangladesh started taking ICT very seriously for educational enhancement. The government, NGOs, and the development sector played a significant role in introducing ICT in education. Since ICT has been introduced worldwide for educational purposes with a belief that it can turn teaching and learning into an enjoyable event to the learners, Bangladesh also followed the current trend in introducing ICT for betterment in the education sector. The National ICT policy of Bangladesh which has been framed in 2009, saw ICT as means of holistic development of the nation. The policy aimed to bring necessary modifications in pedagogy, curriculum, and teachers' capacity building where ICT would be an effective tool. This includes providing ICT literacy to the teachers and learners of primary, secondary, and tertiary levels. Besides, ICT in education was emphasized in National Education Policy, 2010. According to that policy, the GoB intends "to extend the use of information and communication technology in the education process at every level"(Babu & Nath, 2017). Nevertheless, despite all the policies and noble intentions of including ICT in education, it was revealed in the pandemic that Bangladesh is not yet fully prepared for distance learning.

The period of the Covid-19 pandemic is such a time when for the very first time in this world, all the education proceedings were forced to be shifted to online mode. To minimize the spread-out of Covid-19, the GoB announced the closure of all educational institutions on March 18, 2020, and it has continued since then until the reopening of educational institutions in September 2021. This extended break from educational institutes has affected the lives of students intensely.

Though face-to-face classes have been replaced by online classes, the effectiveness of the online learning system is crippled by poor technological infrastructure and unstable internet access. Besides, important exams like board exams, university admission exams, and university semester exams have been suspended during this period resulting in session jam. This is impacting the educational lives of students in different ways including study gaps. Several studies have been conducted which targeted to understand the child marriage (Amin et al., 2021), involvement in paid work as contributing factors to study gaps or dropouts but not much light had been shed on the in-depth investigation of the relation of the digital divide and educational lives across genders, socio-economic groups and different geographical locations of Bangladesh (rural and urban areas). Therefore, this study aims to explore how DAD (digital access divide) and (DCD digital capability divide) have impacted the lives of the secondary school students during the school closure phase of the Covid-19 pandemic. Figuring out any existing gap would thereby aid in future policy implications and appropriate interventions.

1.2 Purpose:

Digital divide affects different aspects of a society including job information and opportunities, communication, education and health information. Amidst the pandemic, all learning mode had been suddenly shifted to online which brought an immense challenge for a country like Bangladesh which has an existing digital divide. The digital divide can be described through two major forms- DAD or Digital Access Divide and, DCD or Digital Capability Divide. Several studies suggest that digital access and digital literacy divide can impact education lives of students adversely. Thereby, the purpose of this study is to investigate how DAD (digital access

divide) and DCD (digital capability divide) are impacting the educational lives of the secondary school students during the school closure phase of the Covid-19 pandemic.

1.3 Objectives:

The broad objectives are to explore the different dynamics of DAD and DCD and their different impacts on the educational life of the secondary students across gender and across different geographical locations (rural and urban areas of Bangladesh).

The specific objectives of this study are to:

1. Explore how DAD and DCD are impacting the educational lives of secondary school students across gender.
2. Explore how DAD and DCD are impacting the educational lives of secondary school students across geographical locations (rural-urban areas).
3. Explore the current situation of the secondary school student after the reopening of school.

1.4 Research gap and motivation (Rationale)

Digital divide had been prevalent in Bangladesh before the Covid-19 period. However, the existing digital divide had been severely worsened by the Covid- 19, thus affecting the educational lives of the students since this was the only mode of study during the school closure period. Different factors such as increased child marriage and involvement in paid work had been identified as major causes that impacted the educational lives of school going children

during the school closure period. However, not much light had been shed on the in-depth connections between DAD, DCD, and educational lives of the school going children although the online platform was the only mode of study during the school closure time in the pandemic. Thus, this study intends to explore this connection between DAD, DCD and educational lives of secondary school children in detail.

1.5 Significance of the study

As the online platform was the only mode of education during the school closure period and studies suggest that it might not be just a temporary mode but can also emerge as a new mode of study (Li & Lalani, 2020; Pacheco, 2020), therefore it is highly essential to deeply understand the different dynamics of the impact of digital access divide and digital capability divide on the educational lives of secondary school students across the gender and geographical locations. This will be helpful in future policy implications regarding education and digital inclusion.

1.6 Limitations of the study

The interviews were conducted by telephone as they were from different regions across the country and traveling to several such locations would not have been convenient during the Covid-19 period. However, there were several challenges for the telephonic interview which includes network problems that resulted in several call drops. Besides, it is very difficult to convince people to talk to a completely unknown person over the phone and share their information. Moreover, as the sample list was taken from the dataset of BIGD, those respondents were interviewed a few times before. Thus, some of them were quite annoyed and unwilling to talk as they said that many have been interviewed us so far and merely wasted our time as we did not receive any single support from them. Moreover, dialects of some of the regions such as

Sylhet was very difficult for the interviewer to understand hence that resulted in a slight loss of information or information gaps. Another limitation was the chance of biased or incomplete information. Due to ethical consideration, permission from the respondents' parents/guardians was obtained and as most of the respondents talked to the interviewer in front of their parents/guardians, there is a possibility of incomplete or biased information.

Chapter 2: Literature review

2.1. Pre-existing digital divide in Bangladesh

2.1. Pre-existing digital divide in Bangladesh

Although Bangladesh had been trying tremendously to fulfill the mission of digitization of the country, a sheer divide exists across locations (digital divide) and among genders (digital gender divide or DGD) in Bangladesh. According to the Internet World Stats's count, the number of internet consumers in Bangladesh till May 2020 was 96,199,000. This indicates a 58.4 percent penetration of the total population. This poor penetration of internet access is one of the major hindrances of online education. Another estimation shows that 60 percent of people of Bangladesh have access to the internet and 92 percent of them use mobile networks or mobile data for using the internet (BTRC, 2020). Nevertheless, the speed of the internet varies widely in urban to rural areas (Sohail, 2020). The price of the internet and the minimum required or basic gadgets for participating in online classes are also beyond the reach of most of the students in Bangladesh (Azad, 2016). Moreover, unequal access to technology and poor internet connection in rural areas also poses a threat to the effectiveness of the online system (Islam & Inan, 2021). According to the Ministry of Education, 60 percent of primary school-going students are

from rural areas, and 70 percent of secondary schools are located in rural areas. Rural schools lack digital devices, digitally skilled teachers, and a strong internet connection, whereas, in the urban areas, students are more likely to have the opportunity of internet access and better technologies (Roy et al). Apart from the rural-urban divide, students from lower-middle-class and low-income families struggle to have access to online learning opportunities (Roy et al). This inconsistency among students has generated a new debate, “Digital Divide” and put the efficacy of online education in a disputed position. This disputed issue has been severely exacerbated when all the schools were suddenly shifted to an online and digital mode of learning due to the Coronavirus pandemic.

Even after the establishment of 24, 816 multimedia classrooms and setting up, providing internet connections to about 90 percent of schools in Bangladesh (a2i Programme, GoB, 2018). , these did not turn out to be fruitful during the school closure period as those infrastructures could not be utilized fully or to their full potential. Due to the high expenses of technology and the supporting pieces of equipment needed to aid in the participation of online classes, thus remote or online education for secondary students is quite a matter of hurdles in a developing country like Bangladesh. For online learning to be successful, internet connection with good speed, devices with cameras, and microphones are highly essential. All these facilities are required both for the students and teachers (Habib et al., 2020). Apart from students, teachers are also facing hurdles in online classes. There is an inadequacy of capable and well-trained teachers in Bangladesh. Besides, only a few teachers have enough internet literacy, availability of necessary equipment, and logistics which are a sheer necessity for online classes to be conducted and be successful (Roy et al).

2.2 Bangladesh Governments' education policy and SDG

The Bangladeshi government has initiated several projects with aid from organizations such as the World Bank and the United Nations Population Fund (UNFPA). These projects were created to address specific matters help accelerate the Bangladeshi education system to achieve SDG Goal 4-Quality Education. Bangladesh has a 99 percent child enrollment rate and a steadily growing 73 percent literacy rate. However, Bangladesh is lagging behind in participation in secondary and higher education. The International Labor Organization recently noted that 27 percent of the youths were not engaged in any form of education, employment, or training.

Education in rural Bangladesh is quite challenging. Many regions lack access to primary schooling, thus very little opportunity is left for their professional growth. The Bangladeshi government expanded access to preprimary and primary schooling, especially in rural areas to ensure increased participation and inclusion of the rural people. Over the last few decades, the government has built thousands of schools and developed infrastructure in rural areas. However, rural education is still a matter of challenge and concern for Bangladesh (Begum et al., 2018).

The National Education Policy 2010 also attempted to address inclusive education by two initiatives: the Second Primary Education Development Program and the Teaching Quality Improvement project. These projects worked in terms of bridging inclusion in the existing education system to some extent. However, there is scope of further work and improvement to mitigate the challenges (Malak et al., 2013).

2.3. Digital Gender Divide (DGD)

Even before the pandemic, the digital access and capability divide were existent across genders and socioeconomic groups. And amidst the pandemic, it has been worsened and the divide has been more clear and vivid as the online platform was one of the widely used platforms to study during the school closure period. Nevertheless, the effectiveness of online education is curtailed by constraints like lack of technological infrastructure, poor internet access, lack of internet literacy, availability of mobile networks, cost of internet, method of online teaching, etc.

Notably, the digital gender divide (DGD) has become a major concern for policymakers. According to the International Telecommunication Union, globally, a greater number of men (58 percent) use the internet than women (48 percent) (ITU, 2019). The gap can mainly be understood clearly in the developing countries where 12 percent fewer women use the internet; whereas the difference is just 2 percent in the developed countries (ITU, 2019). According to literature, double-digit DGD exists in many developing countries like Bangladesh because of a greater gender divide in education, economic status, domestic responsibilities, social and cultural beliefs about ICT, etc. (Singh, 2017; OECD, 2018). Even though Bangladesh has made noteworthy progress in narrowing the gender gap in many areas like education, labor force participation, wages, and income, the progress is likely to be weakened only because of the existing DGD (ADB, 2017). Rural women are further deprived of ICT because they face greater challenges compared to urban women in terms of education, cultural and social norms and beliefs, and ICT infrastructure (Zahan, 2021).

According to the Global System for Mobile Communications (GSMA) 2020 data, Bangladesh has a 29 percent gender gap in the use of mobile phones and 52 percent in the use of mobile internet. Besides, studies suggest that female students mainly used their home broadband connection, whereas their male counterparts mostly used mobile data. Furthermore, 22.3 percent of male students ranked the quality of internet connectivity as high and 38.7 percent as low (with a further 9.62 percent calling it very low), while 29.3 percent ranked it as neither. On the contrary, 17.5 percent of female students ranked their connectivity to be of high quality, 30.9 percent of low quality (with a further 10.46 percent calling it very low quality), and 41.12 percent ranked it neither high nor low. Also, in regard to the digital device used for online study, 28.4 percent of male students reported that they owned personal computers compared to 21.4 percent female students; moreover, 3.5 percent of male students did not have any device compared to 6.8 percent of female students without any device (Mathrani et al., 2021).

According to a recent study, the enrollment of students in the secondary level of education was 67.84 percent, in which girls were 73.10 percent and boys were 63.85 percent (Hossain, 2021). Another study by the Bangladesh Bureau of Statistics suggested that the girls were attending more than boys in secondary education. (Maksuda et al., 2017). Although the enrollment rates are higher for females, at the higher classes of the secondary level, 54.5 percent of non-completers are female which is considerably higher in number than the males (Mizunoya et al., 2021). Besides, a study found that in 2016, the school dropout rate in secondary level among girls was 42.19 percent, while the school dropout rate in the secondary level among boys was 33.80 percent, as per the report of the Bangladesh Bureau of Educational Information and Statistics (BANBEIS).

Moreover, according to a policy brief regarding the digital gender divide, women are far less likely to have access to and skills in digital technology than their male counterparts. As a whole, it indicates a dismal level of digital literacy among women in rural Bangladesh (Zahan, 2021). Besides, a study by BIGD found that girls in rural schools do not have their own mobile phones and parents do not approve their daughters to use the internet (Huq et al., 2021). Further, the gender divide has been worsened by the pandemic where a study reveals that COVID-19 caused millions of girls to be at the risk of school dropout and learning gap risks in the Asia-Pacific (Babb & Buchanan, 2020).

2.4 Exacerbation of the existing Digital Divide during the pandemic

During the pandemic, the depth of the social, technology, and health divides were exposed in Bangladesh (Aziz et al., 2020). As the lockdown began in March 2020, millions of students' education life were hampered as they could not proceed with their education due to the closure of the educational institutions. All the educational institutions starting from primary to tertiary were shut down, however only a few universities used online platforms, but that didn't help millions of students who were disconnected and subject to social isolation. As most of the educational institutions were not adequately equipped digitally, just a few schools could avail themselves of the opportunity to provide online education. From this, the sheer digital divide in Bangladesh could be clearly understood (Aziz et al., 2020).

In developing countries the divide or gap between the haves and have nots, the privileged and the underprivileged class respectively is extremely wide (Venkatesh and Sykes 2013). It is quite

obvious that as in many developing countries, populations do not have access to basic requirements such as healthcare, education, thus digital technologies and ICT are naturally given a lower priority (Srivastava and Shainesh 2015, 246). So, when numerous students were suddenly forced to carry out studies from their home it is very obvious it would be a large shock for them and undoubtedly, the burden would be more on the have nots or the underprivileged ones. Moreover, there are certain gender-based differences and practices in many social structures such as house cleaning, caregiving, and cooking burden on women (Cutter 2017), it would eventually place the females in a far lower position of the divide.

Internet speed in Bangladesh is almost 40 percent lower than the average internet speed in the world (Molla & Islam, 2019). This speed further slowed down as the consumption of the internet has been increased by 25-30 percent during the pandemic compared with the time before the pandemic situation (Islam, 2020). Therefore, online classes in Bangladesh are extremely suffering from a slower internet. Besides, power failures often hinder online classes. Many teachers also complained that controlling online classes is a bit more difficult than real classrooms as they cannot interact with the students directly as face to face classes.

This already existing divide has been worsened due to the pandemic. As the digital platform was the only medium to study during the school closure period, this worsened the situation in a country like Bangladesh where there is already an existing digital divide, thus resulting in a learning loss risk. In a study conducted by BIGD and Universiti of Malaya (Aziz et al., 2020), it was found that there is a decrease of 8 hours of study time from before the Covid-19 period compared with the school closure period. Moreover, the school time, coaching time, as well as self-study time, dropped drastically. Also, online education programs scored the least in ranking.

In a nutshell, the current situation of online education on the secondary level is yet to get up to the mark since the preparatory gap is observable from the resulting facts and both teachers and students are being challenged by various obstacles. Some studies forecasted that online classes that have started due to the Covid-19 pandemic might not be only a transitional phase, rather it might arise as a new normal platform of education at the secondary level for preparing the students of the 21st century (Li & Lalani, 2020; Pacheco, 2020).

2.5. Regional heterogeneity in DAD and DCD

Pieces of evidence regarding significant geographical heterogeneity in digital access and digital skills were found in different studies. The rural households in Chattogram, Dhaka, and Khulna divisions were found to have higher digital access, higher level of digital skills, and a digital literacy rate. On the contrary, Mymensingh, Rangpur, and Sylhet divisions have significantly lower levels of digital access, lower digital literacy rates, and skills. Among the regions that have been surveyed, it was found that Sylhet and Mymensingh divisions have the lowest computer ownership. In both of these divisions, only 1.11 percent of the households were found to own a computer. Contrarily, the highest level of computer ownership is found among the households in Khulna (4.3 percent), and then Dhaka (3.02 percent). However, the numbers are still very much negligible (Shadat et al., 2020).

Regarding communication skills, it is revealed that households in Chattogram and Khulna divisions have higher communications skills. For example, 63 percent of the households in Chattogram and 42 percent of households in Khulna are found to participate in social media. Contrariwise, households in Sylhet and Mymensingh divisions have the poorest communication skills, where only 36 percent and 30 percent of households participate in social media, respectively. Regarding communication skills, it was found that Chattogram and Khulna have

high levels of communication skills. For example, in Chattogram 63percent of households were found to participate in social media, and in Khulna, the percentage was 42. On the contrary, Sylhet performed the worst in terms of various tasks such as internet browsing in different facets.

Overall, quite a high amount of regional heterogeneity had been observed regarding digital access and different digital capabilities. All the test results of that study revealed that the rural households in Chattogram, Dhaka, and Khulna divisions have higher digital skills, while households in Mymensingh, Sylhet, and Rangpur divisions possess a comparatively lower level of digital skills (Shadat et al., 2020). Overall, it has been found that the extent of digital literacy increases with the increase in access to digital devices. Thus, it is evident that DAD and DCD are extremely well connected.

2.6. DAD, DCD, and learning loss risk (pre-Covid-19 and during Covid-19 scenario)

A study by GAGE revealed that students in areas with less digital access and students with lower digital capabilities are vulnerable to learning loss risks. Most adolescents reported having some form of difficulty accessing remote learning at home (Alam et al., 2021). This resulted in reduced study hours and a reduction of interest towards study during the school closure period, thus leading to the discontinuation of their studies. Thereby, it is very much evident that the digital access divide and capability divide have a tremendous detrimental effect on the education of school students, which eventually resulted in an aggravated learning loss risk.

The findings also show that, in spite of various measures taken by the government through online learning and televised lessons, for instance, “Amar ghore amar school” to ease disruptions to

education, study time has been reduced for most school-going adolescents, and some lack access to technologies necessary for distance learning. Their education and learning have, therefore, been greatly affected. The study findings suggest that rural adolescents have less access to distance learning modalities (for instance mobile phone, internet connectivity, and TV) compared to urban adolescents, which for some of the rural school children could lead to a risk of dropping out of school (Alam et al., 2021); (Amin et al., 2021).

Moreover, as per the the report of the Bangladesh Bureau of Educational Information and Statistics, the rate of school dropout in secondary level among female students was found to be 42.19 percent, while the school dropout rate in the secondary level among male students was 33.80 percent. Overall, it was seen that girls are more likely to drop school than boys (Hossain, 2021).

A round survey conducted jointly by BIGD and PPRC found that learning loss risk has been found to be higher among secondary school students both in the pre-Covid-19 and post-Covid - 19 situations (Rahman & Matin, 2021). Other studies had also supported this claim. Also, secondary school students are at more learning loss risk compared to primary school students. Therefore, it is more likely that the impact of the digital divide will be greater on secondary school students compared to primary school students.

In three rounds of COVID-19 follow-up surveys, studies conducted by the Population Council in 2020 exposed that one-third of girls or less (21 percent, 16 percent, and 34 percent in rounds 1, 2, and 3, respectively) followed televised classes. Besides, the data also showed that the study hours of the students declined drastically- while the average study time was 7-8 hours per day in the pre- Covid-19 period, during the school closure time in the Covid-19 pandemic, this declined

to 2 hours per day (Amin et al., 2021). Moreover, the literacy rate also declined compared to the baseline data. At baseline, on average girls correctly answered just two-thirds (65 percent) of the questions, with a median score of 70 percent. In 2021, huge declines in mean and median literacy and numeracy skills were found. Girls' average score fell by 5.2 percent and the median score dropped to 6.25 percent, indicating a learning loss (Amin et al., 2021).

From the above discussions, it is very much evident that a vast digital divide existed before the pandemic in terms of genders, locations, and socioeconomic groups. This was further exacerbated during the Covid-19. The secondary school students were vulnerable to drop out or facing a learning loss risk and their risks had been intensified during the pandemic. Thereby, there is a vital necessity to explore and establish the detailed connections between the digital access and capability divide and its impact on the educational lives of the secondary school students during the school closure period in the pandemic.

2.7 Conceptual Framework:

The conceptual framework adopted for this study is based on the socio-cultural digital divide framework used by Pachler, Cook, and Bachmair (2010). The consecutive extension has been developed by Bannan, Cook, and Pachler (2016).

The above-mentioned socio-ecological framework helped to understand the different dimensions of remote learning and classroom teaching with the help of digital devices. In the existing framework, structure refers to both the formal (school) and informal (out of school) contexts where digital devices are the major modes of learning. Before the widespread of ICTs, schools were viewed as the formal centers for learning but now the online mode has changed the whole scenario. Thus, digital devices are being used in both formal institutions as well as from

nonformal locations (house, coaching centers. Etc). Therefore, the learning phenomenon got very much affiliated with both locations and the cultural contexts of that location. Thus, due to the evolution of ICTs, learning became the function of both the culture and contexts, the learners also wish to enhance their agency to have their desired outcomes in terms of learning.

(Adhikari, Mathrani, and Scoging, 2017). As learning is not confined to formal spaces therefore it became a social phenomenon that depends on various factors such as locations, communities, social contexts, time, and sites of practice. (Bannan, Cook, Pachler, 2016). In the extended framework by Bannan, Cook, and Pachler (2016), the term "learner" was referred to as device user. However, in this study, this term has been modified according to the relevance of the study.

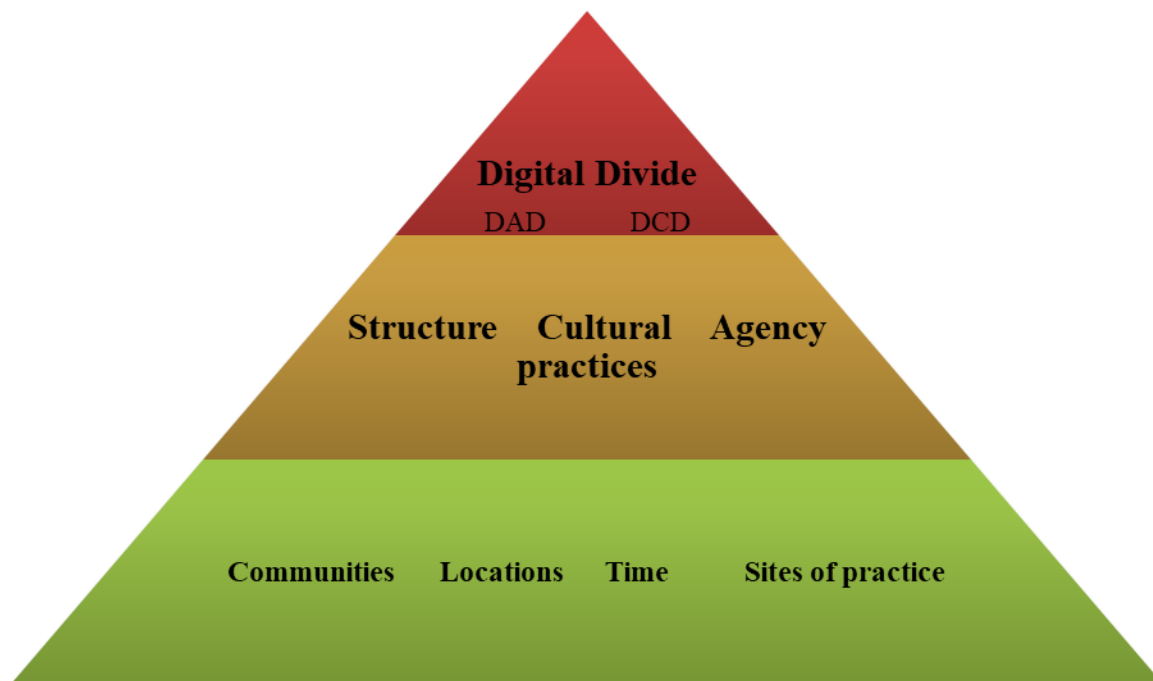


Figure: 1 Modified Digital Divide Framework

The existing framework described above has been further modified according to the relevance of this study, as shown in the figure. Three levels of digital divide had been highlighted in the past literature which are Digital Access Divide (DAD) as the first level, then comes digital capability divide or (DCD) and the third level is the digital outcome divide or DOD. DAD signifies the gap in access to digital devices in the schools as well as home. Material access highly depends on economic, social, local and cultural contexts. The terms of the middle and lower layers of the pyramid had been adopted from the existing framework but the concepts had been developed in relevance to the study. The definitions of the terms are as follows:

1.DAD- Digital access can be understood as people's access, connectivity and ownership to a wide range of electronic digital devices along with networks to use them. Nevertheless, of these devices some of the most vital access points are mobile phones, computers and internet connection (Shadat et al., 2020).

Digital Access Divide or DAD implies a lack of access to the internet and digital devices such as smartphones, tabs, laptops, computers, etc. DAD refers to the gap in access to digital tools in homes and as well as schools. For this study, devices essential for learning or study purposes for instance smartphones, computer, laptop, and tab had been considered. This is applicable for both the interactive and non- interactive devices for remote learning. For interactive learning, devices such as smartphones, tabs, etc. are required and for non-interactive learning having access to television and radio is necessary.

Households with a lower socio-economic status that are located in rural or semi-urban regions are vastly impacted by digital inequality (Maceviciute and Wilson, 2018). Cultural norms can

have a further detrimental impact on the users as well as their usage especially if they are females. For instance, female users face higher hindrances in making full use of digital opportunities, as they may have to align with certain gender-specific expectations often existing in many communities and households. The major causes for this discriminatory behavior could be fears in regard to the online safety of girls, financial limitations causing to lesser opportunities for daughters compared to that of sons (Alozie and Akpan-Obong 2017; Borgonovi et al. 2018). Lack of digital opportunity creates to the second stage of the divide – DCD. It is quite natural that with limited experiences related to device usage and basic knowledge regarding the devices, users are narrowed in practice and therefore they lack relevant digital skills and capabilities. A study through five developing countries asserts that the reasons behind gender divisions in digital ownership are often patriarchal attitudes, societal norms and caste-based traditions (Rashid 2016).

2.DCD: Digital Capability Divide or DCD implies a lack of skills and abilities in regard to the proper use of digital media among students, parents, and teachers. DCD also denotes the lack of digital literacies. In this study we have considered those digital skills which are relevant to study purposes, such as internet browsing, sending text messages and email, making video calls, joining online classes through Whatsapp, Zoom, etc. For interactive learning and operating television and radio channels for non-interactive mode of remote learning.

3. Structure- In this study, structure defines as having access to digital devices and having the capability to use them. Besides, the structure also indicates the necessary supporting factors needed to use a digital device properly, for instance, having access to the internet, electricity, etc.

4. Cultural practices- By cultural practices, it indicates the gender discriminatory practices which influence the access of device and the capability to use them across genders. Cultural norms and practices can seem to be a huge obstacle for device usage, access or digital opportunities that confines the users' digital capacities. For instance, female users face greater hurdles in making full use of digital capabilities and opportunities, as they may often require to fit into certain gender-specific expectations in households (Mathrani et al., 2021).

5.Agency- In this study, agency refers to the convenience and willingness of the learners to have access and capability to use digital devices.

6.Time- The time in this study is defined as the school closure period in Bangladesh from March 2020 to September 2021.

7.Communities- Different community norms are seen to have certain gender expectations, and people are assigned specific duties according to the expectations. These expectations may get more extended at particular times such as when faced with difficult situations like in the lockdown or school closure period amidst the pandemic (Bauza et al. 2021). Along with the severe financial burdens, the pandemic exacerbated certain additional gendered burdens, such as female students living with extended families were seem to be loaded with greater responsibilities which cause their deviation from access to devices or developing capabilities to use them. Different facets of these are seen in different socioeconomic categories thus this study refers to the different socioeconomic categories as communities.

8.Location- location in this study refers to different geographical locations (rural and urban areas) of Sylhet and Mymensingh divisions and urban areas of Dhaka city.

9.Sites of practice- this involves classrooms (particularly of Madrasah as only some of the Madrasahs were open during the school closure period), homes, and private tutor's place where the learners can study.

10. Learners- in the existing framework, learners meant those who are device users. However, in this study, learners refer to the secondary school students between the age of 12-17, either having access to devices and the capabilities to use them or not having access to devices and the capabilities to use them.

Chapter 3. Methodology

3.1 Research Design:

A qualitative case study approach has been adopted for this study to investigate the different aspects of digital access divide and digital capability divide in detail and how these factors are impacting the educational lives of the male and the female secondary school students across different geographical locations and different socioeconomic groups in Bangladesh. This study utilizes both primary and secondary data. Secondary data has been collected through peer-reviewed journal articles, both national and international newspaper articles, conference papers, and reports. Primary data was collected from the respondents selected from the sampling list of

the round survey of BIGD-PPRC. Information has been collected from secondary school students aged between 12 to 17 years. A total 9 respondents, both male and female, were chosen from the rural and urban areas of Sylhet and Mymensingh Division and urban areas including slum areas of Dhaka city. Respondents' guardians have been interviewed as well to get detailed ideas of their household dynamics and livelihood information. Thereby, a total 17 interviews had been conducted: 9 secondary school students (which include 5 males and 4 females) and 8 guardians (among the respondents two were siblings).

3.2 Sampling

The respondents were selected across different socioeconomic backgrounds which include extreme poor, moderate poor, vulnerable non-poor and non-poor. The sample list had these 4 categories of respondents:

Extreme poor: HHs with per capita monthly income below or equal to the lower poverty line have been categorized as extreme poor. The HIES 2016 report presents divisional lower poverty lines using the Cost of Basic Needs (CNB) method (Rahman et al., 2020).

Moderate poor: HHs with per capita monthly income above the lower and below or equal to the upper poverty lines have been categorized as poor (Rahman et al., 2020).

Vulnerable non-poor: Though official classification does not include the category of vulnerable non-poor, the need was already identified in earlier poverty studies to differentiate the group that is at risk of falling back to poverty from the group that is not. The PPRC-BIGD survey findings have validated the need for differentiating the vulnerable non-poor, HHs subsisting within a vulnerable band above the poverty line (Rahman et al., 2020).

Non-poor: It has been categorized the HHs with per capita monthly income above the median income (i.e. BDT 3,872 for 2020) as non-poor (Rahman et al., 2020).

Respondents profile:

The respondents were selected from different geographical locations, genders and socioeconomic backgrounds to understand the heterogeneity of the impact of digital access divide and digital capability divide on learning loss risks across the different groups of secondary school students. The study includes respondents with an age range of 12 to 17 years. We have drawn samples from the sampling list of BIGD-PPRC study -round 3 part 2 (Rahman & Matin, 2021).

The respondents’ profiles are provided in tabular form below:

Respondents (pseudonyms)	Gender	Age	Geographical location	Rural/urban	Socioeconomic group	Institution(before Covid- 19)	Current status
Amina	Female	16	Sylhet	Rural	Moderate poor	BRAC School upto class 5 then	Passed Dakhil

						shifted to Alia Madrasa	exam in 2021
Mizan	Male	14	Sylhet	Rural	Extreme poor	Private school	Studying at class 8 of a private school
Asma	Female	17	Sylhet	Urban	Extreme poor	Private highschool	Passed SSC exam in 2021
Shaheen	Male	14	Sylhet	Urban	Extreme poor	Technical school (Government)	Studying in the same school in class 8
Maruf	Male	17	Dhaka	Urban (slum)	Extreme poor	Private school	Passed SSC exam in 2021

Nasrin	Female	16	Dhaka	Urban	Moderate poor	Private school	Passed SSC in 2021
Momota	Female	17	Mymensingh	Rural	Non-poor	Government School	Passed Dakhil exam in 2021
Nasim	Male	14	Mymensingh	Urban	Vulnerable non-poor	Madrassa (from the beginning of his educational life)	Studies in class 8 at Madrassa
Zaman	Male	14	Mymensingh	Rural	Vulnerable non-poor	Private school	Studies in class 9 in a private school

Table 1: Respondents' profile

Sampling method:

The samples were drawn from the sampling list of the round survey (round 3 part 2) conducted by BIGD and PPRC on the educational lives of children during Covid-19 pandemic. At first, from the list of around 4000 respondents, purposeful sampling was conducted where respondents from Sylhet, Mymensingh and Dhaka division were chosen as those areas having the least digital access and capabilities (Sylhet and Mymensingh) and more dropout rates (Dhaka). The list was then narrowed down to 200 respondents after purposive sampling. The study intended to conduct 9-10 in-depth interviews therefore selected 60 respondents randomly (6 *10) so that at least one respondent could be reached from each 6 calls as some of them might not be available. Thus, after trying to reach out to 60 respondents, 9 respondents and their parents could be finally contacted since some of them did not receive the call, some were not willing to talk, and in some households there were no children of the required age range. From the Sylhet division, 2 rural respondent(1 male and 1 female) and 2 urban respondents (1 male and 1 female) and their guardians were interviewed. From the Mymensingh division 3 respondents (1 rural male, 1 rural female and 1 urban male) and their guardians were interviewed. From the Dhaka city, 2 respondents were selected – 1 male from the urban slum and one female. They along with their guardians were interviewed.

3.3 Data collection:

Data was collected in a timeframe of one month. In-depth semi structured interviews were conducted through telephone. In total 9 respondents were selected according to the sampling method mentioned in the above section. Different socioeconomic groups were selected to ensure maximum variation. Although the data were collected mainly along a one month time period, however, few of the respondents were contacted for a second time to collect some missing information.

3.4 Data analysis

All the interviews including interviews with the guardians and respondents were recorded. Each recording ranged from 25-35 minutes. After the interviews, the recordings were transcribed and thematic analysis was carried out to organize the findings. Also, notes were taken during the telephonic interviews which made the data analysis more ordered and strategic.

Thematic analysis is a method for analyzing qualitative data that involves searching across a data set to find and analyze repeated patterns. It involves the process of construction of themes and subthemes and interpretation of those. Thematic analysis is a suitable method of analysis where there is a need to understand experiences, behaviors, practices and thoughts across a set of data. Themes are the constructed patterns resulting from a data set that aids answer a research question (Kiger & Varpio, 2020; (Majumdar, 2022)). In this study, the purpose was to understand the different dynamics of the impacts of digital divide across genders and different locations. The diverse causes of lacking access to digital devices and having lower capacities and the different

impacts on the educational lives of the secondary school students across genders and locations have been studied, thus thematic analysis was the most suitable data analysis method for this study.

The thematic analysis in this study was carried out using the socio-cultural framework by Pachler, Cook, and Bachmair's (2010). The framework had been further modified according to the relevance of this study. The three themes from that framework are- structure, cultural practices and agency. Under these themes, sub-themes were generated under which the relation of digital divide and the dynamics of gender and geographical locations were analyzed. Besides, the respondents' current status of education was also studied.

3.5 Ethical consideration:

The guardians and the respondents were informed about the reason and significance of the telephonic interview as well as informed about the conversations that will be recorded, and their prior consent was approved, as well as recorded. To protect the respondents' rights and identity, pseudonyms were provided.

Chapter 4: Findings

Theme	Sub-theme	Main findings	Impacts on the respondents educational lives
1. Structure	1.1 Access to digital devices	1. Rural females do not have access to devices (mainly interactive devices)	<p>They have least knowledge about different online platforms and the wide variety of study materials available online.</p> <p>They have to depend on self-study or private tuition (that are often quite costly for their families to bear)</p>

		<p>2.Urban females have greater access in comparison to rural females, but their access varies across locations (Nasrin- Dhaka female have more access compared to females of other locations)</p>	<p>Parents of the Dhaka female want to provide her with higher education and do not want her to get married early.</p>
		<p>3.Rural males have access to non-interactive devices and their family members interactive digital devices (Azaman and Mizan have access to their elder siblings own digital devices)</p>	<p>The rural male respondents reported to have no difficulties in understanding their studies after reopening as having access to digital devices and could use those devices for study purposes which help them to reduce study gap during the school closure period.</p>

		4.Urban males have their own feature phones.	They can communicate with their own devices and exchange study related information with their friends and classmates.
	1.2 Digital capability	1. Rural females have lower digital capabilities compared to the urban females	They had to depend on private tuition which was quite expensive for their families to bear (Amina and Momota)
		2.The digital capabilities of the urban females vary across locations	Urban respondent with lower digital capabilities have to depend on others to gather study related information which are easily available online Both Asma and Nasrin (urban females) were SSC candidates but Nasrin did

			<p>far better in her exam compared to Asma. The probable reasons were lack of digital access and capability and more household responsibilities for Asma in comparison to that of Nasrin.</p>
		<p>3.Rural males have capabilities to use digital platforms</p>	<p>Thus it helps the rural males to reduce the study gap as they continue to study online.</p>
		<p>4.The capacities of the urban males varies across the locations</p>	<p>Maruf (Dhaka male) was found to have knowledge about typing in computers and emailing which the other urban respondents lacked.</p>

	1.3 Access to electricity and internet	1.The rural and urban regions both were found to have access to electricity, however the rural respondent of Sylhet mentioned about extreme load-shedding.	Online classes and studies of Mizan (rural male, Sylhet) was quite hampered due to this frequent electricity failure.
		2. All the respondents who have access to digital devices were found to use mobile data internet, only exception was the female respondent (Nasrin) from Dhaka city who had access to her neighbors' Wi-Fi.	Nasrin could avail large bandwidth due to having access to Wi-Fi which helped her to attend online classes in Zoom. She was the only respondent who attended Zoom class (the other respondents who attended online classes connected through WhatsApp).

	1.4 Variation across sites of practice	1. Most of the guardians as well as respondents were found to be comfortable in studying private tuition (both in their houses and at their tutor's place)	High education expenses
		2. Females in general were found to be more eager for group studies at home or through phone calls	<p>Positive impact- increases communication skill and productivity in studies.</p> <p>Negative impact- not having access to a broader environment might limit their knowledge and understanding regarding DAD and DCD.</p>

		3.The private schools were found to have conducted online classes through WhatsApp and Zoom, unlike the Government schools	3.The students of the private schools did not have to face any study gap as their syllabuses were being continued through online
2. Cultural Practices	2.1 Knowledge about the digital platforms	1.Rural females have lack of awareness about interactive digital platforms but have ideas about non interactive platforms for remote study purposes.	They lag behind in regard to having access to education related information and other knowledge at a wider range.
		2.Urban females are aware of both interactive and non-interactive remote study platforms (only female respondent of Dhaka city used an	They are comparatively updated in regard to having access to different study related information in comparison to the rural females.

		interactive platform).	
		<p>3.Rural and urban males have better knowledge about both types of platforms and some of them have attended online classes.</p>	<p>They are more updated regarding studies as many of them are capable of accessing the internet (either from their elder siblings device or from their relatives device)and availing study materials from Google and YouTube (because of this respondent 4, Shaheen was ahead of studies compared to his elder sister respondent 3, Asma).</p>

	<p>2.2 Cultural norms across gender</p>	<p>1.The rural female respondents have an idea that the interactive digital devices will spoil them and distract them from their studies</p>	<p>They are growing up with a one-dimensional tunnel-visioned mindset and are totally unaware of the sheer importance of digital devices in study purpose.</p>
		<p>2.Urban females have preferences and eagerness towards digital devices</p>	<p>They are more open to new information and this helps them to garner new knowledge which is also helpful for their educational lives.</p>

		<p>3.School attendance of female students varied across geographical locations after the reopening of schools.</p> <p>(Dhaka female respondent reported higher attendance of female students in her school while Sylhet urban female respondent reported to have lower attendance of female student in their schools due to many of them being married off)</p>	<p>This will eventually result in a gender gap in education as female students seem to lag behind compared to the male students.</p>
<p>2.3 Cultural practice across communities</p>	<p>1.Rural females were found to have shifted to Madrasha, majorly due to religious purpose.</p>		<p>It helped in continuing their studies in the school closure period as only some of the Quomi Madrasahs were open</p>

	and locations		during the closure period.
		<p>2.Guardians of rural female respondents do not prefer to continue their studies even after better socioeconomic conditions compared to the Dhaka city female respondents family who wants to provide her higher education</p>	<p>This discontinuity in studies will increase the possibility of learning loss for these female respondents and eventually lead to a gender gap in education.</p> <p>In the long run, it will hamper Bangladesh from meeting the SDGs 4 and 5- providing quality education and enforcing gender equality.</p>

		<p>3.Females especially rural females and females from urban areas outside Dhaka were found to have a huge household work burden compared to the male respondents and their male siblings.</p>	<p>3.These females will not be able to achieve their desired goal for education due to the huge burdens on them.</p>	
3.	Agency	3.1 Preference towards mode of learning	<p>1.Rural females were found to have more inclination and preference towards non- interactive platforms</p>	<p>They might remain unaware of the usefulness of the interactive study platforms.</p>
			<p>2.Urban females were found to have interest towards online interactive platforms and value its importance.</p>	<p>They are most likely to be open to a wider range of knowledge about different educational platforms which can benefit them in the long run.</p>

		<p>3.Rural males who study in private schools were found to attend online classes regularly.</p>	<p>3. This helped to reduce the learning gap among the rural male students.</p>
		<p>4.Urban males have sheer eagerness to have their own digital devices especially a smartphone</p>	<p>4.They are more likely to learn about different usefulness of the online learning platforms and implement in their educational lives for better results.</p>
<p>4. Current situation</p>	<p>4.1 Risk of dropout</p>	<p>1.Excpet for the female respondent of Dhaka city, all other female respondents are not continuing their studies after passing the SSC exam.</p>	<p>This will eventually increase the gender gap in education as a whole.</p> <p>This will further increase the number of under-age marriages in the country.</p>

		<p>2. The urban male of Dhaka slum will not continue his studies after SSC due to the economic condition of his family.</p>	<p>Getting involved in paid work.</p>
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Table 2: Findings

4.1 Structure:

4.1.1 Access to digital devices

It was found that rural females do not have access to digital devices (mainly interactive devices). Neither do they have their own devices nor have access to devices from their friends. This is most likely since the rural females generally mix with female friends and relatives who are also in a similar situation as them - not having access to digital devices, mostly interactive devices such as smartphones, tabs, or computers. However, among the two rural respondents, one of them (Amina-respondent of Sylhet) have a TV in her house and sometimes she watched televised classes initiated by the Government of Bangladesh.

"I do not have my own phone nor any of my family members have got a smartphone. However, I have a TV at my house and I have watched the televised classes a few times."

- Amina, 16 years old, rural female (Sylhet)

On the contrary, it was found that urban females have greater access in comparison to rural females, but their access varies across locations. For instance, Nasrin (female from Dhaka city) has better access in comparison to the female of urban area in Sylhet- Habigonj Sadar (Asma). The reason is most likely to be the different environment and socio-cultural practices of Dhaka and Habiganj or the difference may be due to their socioeconomic background as respondent 6 is from a moderate poor background whereas respondent 3 is from an extreme poor background.

It was also found that the parents of Nasrin were very much eager to provide higher education to their daughter and they are not at all interested to marry her off so early.

"Although we are poor people we will give our best effort to make our daughter highly educated. Besides, we do not want to marry her off so early."

- Mother of Nasrin, urban female (Dhaka)

Rural males have access to non-interactive devices and their family members' interactive devices. For instance, Mizan and Zaman, rural males from Sylhet and Mymensingh respectively, use their elder siblings' smartphones for their study purposes. Therefore, the rural males reported having very little difficulties in understanding the lessons being provided in their schools after reopening as they could access study materials from Google and YouTube and attended online classes which helped them to reduce their study gaps during the school closure period.

"I felt really good after reopening of my school as I was facing almost no difficulties in understanding the lessons being taught in our classes. This is because I attended online classes of my school on a regular basis during the school closure period which helped me to be ahead in

studies compared to my friends who are lagging behind as they could not join the classes during the closure period due to not having access to digital devices."

-Zaman, 14 years old, rural male (Mymensingh)

It was found from the study that urban males have their own feature phones. This helped them to communicate with their classmates and friends frequently and exchange study-related information.

"I have my own feature phone and I am able to read and send messages from it."

- Maruf, 17 years old, urban male (Dhaka slum area)

4.1.2 Digital capability

Findings revealed that rural females have lower digital capabilities compared to urban females. As discussed above that rural females neither have their own digital device nor can get access from their friends, neighbors, and relatives. Thus, it is quite obvious that they would not have adequate digital capabilities. As a result, they had to completely depend on private tuition which was quite expensive for their families to bear. Amina (rural female of Sylhet) is from a moderate poor background. Her father does not have work as he is quite aged (57 years old) as well as suffering from sickness. They are maintaining their livelihoods by selling lands and taking loans. Even then, her private tuition fees were monthly 700 taka which was a huge expense for her father who is suffering from sickness and joblessness.

The digital capabilities of the urban females were found to vary across locations. Dhaka urban respondent, Nasrin, has better digital capabilities compared to the urban respondent of Sylhet.

She is capable of browsing the internet and downloading study materials from Google and YouTube. However, it is quite obvious that as Nasrin had access to digital devices, unlike Asma, urban respondent of Sylhet, Dhaka respondent will naturally have better digital capabilities compared to the Sylhet respondent. As a result, Asma had to depend on others to gather study-related materials that are easily available online.

"I know there are study materials available online which are quite helpful. However, I do not know how to access those as I do not have access to a digital device. Thus, if I felt the necessity to download online study materials, I used to take help from my paternal uncle. He used to download a few materials from his phone and I studied a few times with those materials. Those were quite helpful."

-Asma, 17 years old, urban female (Sylhet)

Both the urban female respondents Asma and Nasrin were SSC candidates and while collecting the missing information, it was found that both of them have passed SSC but Nasrin achieved far better results compared to Asma. The possible reasons could be respondent Asma had no access to digital devices and thus could not study online regularly, thus might have missed out some important lessons which were necessary to learn during the school closure period. On the other hand, Nasrin could access online study materials on a regular basis and also attended online classes which helped her reduce the study gap and achieve a better result.

Another likely cause could be the vast household responsibilities that Asma had to take care of as her father was sick for a long time, thus she got much lesser time to study in comparison to Nasrin.

"When there is so much tension in the house due to father's prolonged illness, it's very difficult to concentrate on studies. Moreover, I also could not attend my school regularly after reopening due to household responsibilities."

- Asma, 17 years old, urban female (Sylhet)

For the rural males of Sylhet and Mymensingh divisions, it was found that they have digital capabilities like joining WhatsApp group calls, browsing information from the internet, and downloading videos from YouTube for study purposes. This immensely helped the rural male respondents to continue studying online which eventually helped reduce their study gaps during the school closure period.

The digital capabilities of the urban males were found to vary across locations. Maruf (urban respondent from Dhaka) was found to have knowledge about typing on computers which Shaheen (urban respondent of Sylhet) and Nasim (urban respondent of Mymensingh) did not have. It is quite interesting that despite being from an extreme poor background, Maruf was found to have better capabilities in comparison to the urban respondents even though one of them (Nasim) was from a vulnerable non-poor background.

4.1.3 Access to electricity and internet.

The rural and urban regions both were found to have access to electricity, However, the rural respondent of Sylhet mentioned extreme load-shedding in their at as which hampered his studies due to frequent electricity failure.

As a result, online classes and studies of Mizan (rural male from Sylhet) were slightly hampered due to this frequent electricity failure.

“ In our area, we often suffer from heavy load-shedding. This hampers my studies quite a lot.”

- Mizan, 14 years old, rural male (Sylhet)

Moreover, all the respondents who have access to digital devices were found to use mobile data internet, the only exception was Nasrin, the female respondent of Dhaka city who had access to her neighbors' Wi-Fi connection. Therefore, respondent 6 (Dhaka female) could enjoy a larger bandwidth due to having access to Wi-Fi which helped her to attend online classes in one of the online learning platforms Zoom. She was the only respondent who attended Zoom class (the other respondents who attended online classes attended through Whatsapp). This along with downloading different study materials from the internet helped her to continue studies in the school closure period.

4.1.4 Variation across sites of practice

Most of the respondents were found to be comfortable in studying private tuition (both in their houses and at their tutor's place) As a result, the expenditure of their parents increased vastly. Some of the guardians mentioned that the private tuition fees of their children were 700 takas monthly (for rural female respondents of Sylhet) and 500 taka monthly for the urban female respondent of Sylhet. They are from moderate poor and extreme poor backgrounds respectively and both of the male heads of the households are sick and jobless and they are living on loans and selling their lands. In such a condition, this expenditure turns out to be a huge burden for them. However, the guardians and respondents still prefer private tuitions in any situation.

“ Private tuition helps me a lot and I think it is enough for me. Moreover, I sometimes do a bit of self-study, so overall it is helpful.”

- Amina, 16 years old, rural female (Sylhet)

“Although we are poor and the cost of private tuition is quite high for us, still we are trying hard to give the best for our children.”

-Father of Asma, urban female(Sylhet)

Females were found to prefer group discussions at home or phone calls. Even though one of them (Nasrin) had access to digital devices, she preferred downloading the study materials from the internet and having a group discussion with her friends regarding those materials and topics. The possible reason could be females are more comfortable interacting with females only.

“Yes, I can download study materials from the internet, and then I prefer to have a group discussion with my friends regarding the materials.”

- Nasrin, 16 years old, urban female (Dhaka)

However, the possible positive outcomes of group study are improvement in communication skills, collaboration, and enhancement in brainstorming and providing creative ideas. This also enhances group productivity as well. (ref) - On the other hand, the possible negative impacts could be that sticking to only group studies may constrict or limit their knowledge and understanding regarding the importance of digital access and capabilities and to explore more options online which could be further effective for their study purpose.

Findings revealed that the private schools conducted online classes through WhatsApp and Zoom in the school closure period, unlike the Government schools. Therefore, the students of the

private schools did not have to face any study gap as their syllabuses were being continued online.

4.2 Cultural practices

4.2.1 Knowledge about the digital platforms

Rural females were found to have a lack of awareness about interactive digital platforms but have ideas about non-interactive platforms for remote study purposes. Thus, they lag behind in regard to access to education-related information and other knowledge.

On the other hand, urban females are aware of both interactive and non-interactive remote study platforms (only female respondent of Dhaka, Nasrin used an interactive platform). As a result, they are comparatively updated in regard to having access to different study-related information in comparison to the rural females.

Findings also reveal that rural and urban males have better knowledge about both types of platforms and some of them have attended online classes. They are more updated regarding studies as both the rural male respondent from Sylhet and Mymensingh are capable of accessing the internet from and joining online classes in WhatsApp. The urban male of Sylhet is capable of downloading a few study materials from his paternal uncle's smartphone. Therefore, Shaheen was ahead of his studies compared to his elder sister Asma.

4.2.2 Cultural norms across gender

The rural female respondents have an idea that the interactive digital devices will spoil them and distract them from their studies. Due to this socially constructed deep-rooted thought, these females are growing up with a one-dimensional tunnel-visioned mindset and are totally unaware of the sheer importance of digital devices in study purposes.

“I do not need a smartphone. If I have a smartphone, it might spoil me as I would be addicted to different activities online which will be harmful to my studies.”

- Amina, 16 years old, rural female (Sylhet)

“Well, honestly I never felt like I need to study online or through a smartphone, or through the internet. I believe if I had a smartphone, it would have caused distractions to my studies as it has so many features which could easily deviate me away from the studies.”

-Momota, rural female (Mymensingh)

Contrarily, urban females have preferences and eagerness towards digital devices. They are more open to new things and this helps them to garner new knowledge which is also helpful for their educational lives.

“If I had a smartphone, I could access study materials form online by myself and it would have helped me a lot to do better in my studies.”

- Asma, 17 years old, urban female (Sylhet)

It was also found that school attendance of female students varied across geographical locations after the reopening of schools. (Dhaka urban female respondent reported higher attendance of female students in her school while Sylhet urban female respondent reported to have lower attendance of the female students in her school due to many of them being married off, thus are not being able to continue their studies. Discontinuity in studies of the female students will therefore result in a gender gap in education as female students seem to lag behind compared to male students.

4.2.3 Cultural practices across communities and locations:

Both of the rural female respondents were found to have shifted to Madrasah. One of their parents mentioned that they want their daughter to be on the religious path thus even though the tuition fees of Madrasah are quite higher compared to their previous school, they prefer their daughter to continue her studies at Madrasah.

“My daughter studied up to class 7 in a Government school where we had to pay no tuition fees. However, I believe it would be better if she studies in the religious line thus even though the fees are quite high, I preferred her to study in Madrasah.”

-Father of Momota, rural female (Mymensingh)

Parents of rural female respondents do not prefer to continue their studies even after better socioeconomic conditions compared to the Dhaka city female respondents’ parents who want to provide her higher education.

“My daughter had passed the Dakhil exam, I do not want her to continue studies anymore. I am thinking of fixing her marriage soon.”

-Father of Momota, rural female (Mymensingh)

Moreover, Females especially rural females and females from urban areas outside Dhaka were found to have a huge household work burden compared to the male respondents and their male siblings. These females are less likely to be able to achieve their desired goal for education due to the huge burdens on them.

4.3. Agency

4.3.1 Preference towards mode of learning

Both the rural females were found to have more inclination and preference towards non-interactive platforms. Thereby, they might remain unaware of the usefulness of the interactive study platforms.

“We have a TV at our house and sometimes I do watch the televised classes initiated by the Government. I enjoy the classes.”

- Amina, 16 years old, rural female (Sylhet)

On the other hand, urban females were found to have an interest in online interactive platforms and value their importance. They are most likely to be open to a wider range of knowledge about different educational platforms and it helps them in their study purposes quite a lot as it is possible to achieve a global perspective through different online platforms and study materials.

It was found that rural males who study in private schools attend online classes regularly. This helped to reduce the learning gap among the rural male students.

Urban males have sheer eagerness to have their own digital devices, especially a smartphone. They are more likely to learn about the different usefulness of the online learning platforms and implement them in their educational lives for better results.

“It would have been great if I could have access to an interactive digital device like a smartphone. Then I could have learned a lot of new study-related things from the internet.”

- Maruf, 17 years old, urban male (Dhaka slum area)

4.4 Current situation

4.4.1 Risk of dropout

Except for Nasrin, the female respondent of Dhaka city, all other female respondents are not continuing their studies after passing the SSC exam. This situation is very likely to eventually increase the gender gap in education as a whole. Also, this will increase the number of underage marriages in Bangladesh even more.

The urban male of Dhaka slum will not continue his studies after SSC due to the economic condition of his family. He will be joining paid work to support his family.

“As I had an accident and could not work for a long time, our economic condition fell drastically. My son wanted to leave his studies and get involved in paid work but I insisted him to continue till SSC and after that, he will join the paid work.”

- Father of Maruf, urban male (Dhaka slum)

Chapter 5: Discussion

Structure:

From the findings, it has been revealed that the Digital Access Divide (DAD) and Digital Capability Divide (DCD) are having a heterogeneous impact on the secondary school students in Bangladesh. The effect of DAD and DCD varies significantly across genders, locations, and socioeconomic groups.

It was found that due to having a lack of access to digital devices, the rural females have very little knowledge about different online platforms and the wide variety of study materials available online. Thereby, they have to depend fully on self-study and private tuition in particular where there is a fear of not getting quality education as private tuition is not always fruitful for students as there are issues of biased teaching, leaking questions by teachers, etc. in many cases (“Coaching centres to”, 2018). Extreme inclination towards private tuitions without a good quality of education will not help the student achieve their desired goals in the long run and as a whole, Bangladesh might lag behind in terms of achieving SDG 4- Quality education. Moreover, cost burdens are often associated with private tutoring. Studies suggest that tutoring investment can increase the dropout rate of students due to the financial burden on the families (Mahmud, 2021). A study of dropouts in schools in slums of Delhi, India found that 25.9 percent of the respondents mentioned their incapability to maintain the cost of private tutoring (Chugh 2011, p. 23). Therefore, sticking to only private tuition might not be fruitful for students in the long run, especially students from extreme and moderate poor socioeconomic backgrounds.

Although rural females were found to have lesser digital capabilities in comparison to the urban females and the male respondents, however, a general pattern could not be drawn for the geographical heterogeneity in terms of digital capability because it varies across not only among urban and rural areas but even among different urban areas of various regions throughout the country. For example, the study revealed that respondents from urban areas of Dhaka even urban slums of Dhaka city, have comparatively better digital access and digital capabilities compared to the urban areas of Mymensingh and Sylhet divisions. Interestingly, both the male and female respondents from Dhaka city are from the extreme-poor and moderate poor socioeconomic backgrounds. Despite that, they were found to have greater digital device access and digital skills compared to the respondents of other regions although some of them were from vulnerable non-poor and non-poor backgrounds. Thereby, it can be asserted that location plays a vital role in the heterogeneity of the impacts of DAD and DCD on secondary school students.

The findings support the conceptual framework where the digital divide has been found to vary across locations and socioeconomic groups in terms of structure, cultural practices, and agency. The massive heterogeneity in terms of digital access and digital capabilities had been revealed across genders. This gender difference or divide strongly supports the literature where it was asserted that females are lagging behind in terms of having access to digital devices and acquiring digital capabilities or skills (Zahan, 2021). A gender divide was even found between the female and male respondents of Dhaka urban areas. Although the male respondent of Dhaka urban area lives in a slum and is from an extreme-poor socioeconomic background, he has got higher mobility and because of that, he was able to acquire better digital capabilities (even though he do not own or neither he has an interactive digital device in his household) compared to the female respondent of urban Dhaka who is a non-slum dweller and is from a moderate-poor

socioeconomic background. The male respondent of Dhaka reported traveling to his private tutors' place for studying while his sister used to study at home with her elder brothers' guidance. The other male students were also reported having high mobility. Thereby, when male respondents are traveling to different places, talking and mixing with different people, they get the opportunity to acquire more knowledge including digital knowledge. Even if they do not have their own smartphones, they get the basic idea about operating those devices by taking help from their friends and others, and even sometimes use their smartphones. This finding regarding the higher mobility of males strongly supports the literature (Alam et al., 2021). On the contrary, as the females have lesser mobility compared to the males, they do not have the opportunity to mix with a vast number of people. Oftentimes, it is seen that they are mixing with are mostly females, and they also have very little or negligible ideas regarding digital skills and online platforms. Thereby, the females are deprived of the opportunity of gathering knowledge through different aspects. Thus, the study also points out a close relationship between mobility and digital access and capability.

Besides, the rural male respondents were found to have better digital access and capabilities compared to the urban female respondents, despite being from a weaker socioeconomic background compared to some of the female respondents. Thus, it cannot be straightaway asserted that socioeconomic background only or location only are playing a vital role in the digital divide, rather all the factors- gender, location, socioeconomic background are very much interrelated to each other. Thus to understand the causes and dynamics of the digital divide and for policy implications of digital inclusion, all these factors need to be carefully considered.

Another vital point to be noted is having access to electricity. Without electricity, the devices cannot be charged so those will be of no use. Thus in areas with electricity problems, it is much

more difficult to have proper digital device access. It was revealed from the study that the rural male respondent of Sylhet is suffering from a frequent load-shedding problem. This finding supports the previous literature where it was suggested that the rural adolescents have less access to distance learning modalities (for instance mobile phone, internet connectivity and TV) compared to the urban adolescents, which for some of the rural school children could face a learning gap (Alam et al., 2021). Nonetheless, in this study, it was found that some of the rural areas of certain locations are better equipped with electricity (such as Netrokona district, Mymensingh division) and rural students particularly the male students have access to digital devices and have provision for online learning from their schools. On the contrary, the rural respondent from Sylhet reported that they have a severe load-shedding problem in their area.

Another finding suggested that the private schools are the only ones who provided online classes during the school closure period, unlike the Government schools. Although the government initiated multimedia classes nationwide, even then only a few schools and teachers seemed to have the capability of conducting classes online. Nearly 72 percent of the secondary schools got multimedia facilities and about 82 percent got computer facilities from 2015. Also, the availability of computer teachers in the secondary schools was 61 percent. Till 2013, 18,500 secondary teachers received training on preparing digital multimedia content (Babu & Nath, 2017). Even after all these major steps, the education system of Bangladesh could not properly manage the online learning mode. Thus, there is a sheer need for policymakers to take these matters into consideration.

Cultural practices:

In the literature, several reasons for the digital gender divide were mentioned which include societal norms and cultural practices (Zahan, 2021). The study findings are also very similar to the literature. The study revealed that the female respondents, especially in the rural areas, have a strong belief that having access to a digital device especially smartphones would make them spoiled and distract them from studies. This shows how deep-rooted the societal norms are especially in rural Bangladesh. The cultural practices had been followed from generation to generation in such a way that any activity of the females had been associated with the honor and modesty of a family. As such, the regular lives of many females are hindered in terms of important aspects of life such as education. This study also reveals the digital gender divide and how it is having an impact on the educational lives of female students especially in rural areas of Bangladesh, which are already suffering from digital exclusion (Islam & Inan, 2021).

Moreover, it has been seen that both the rural female respondents' parents shifted them to Madrasah from the general education line. One of the guardians mentioned that they want their daughter to be on the religious path. Another guardian mentioned that as all the schools were closed during covid-19 and only Quomi Madrasahs were open, thus they shifted their daughter to Madrasah. This helped the student to reduce her learning gap, however, extreme inclination towards Madrasah also poses a risk for female students in terms of their safety as several Madrasah and the teachers have been accused and proven guilty of committing crimes such as sexual harassment at Madrasah (Tithila, 2021; "Are girl students", 2019).

It was also found that after the reopening of the school, the attendance rate of female in Dhaka was comparatively higher than in other regions such as Habiganj, Sylhet as many of the females were married off thus they had to discontinue their studies. Also, the overall household responsibilities of female students were greater compared to the male students, despite the difference in geographical locations.

These finding regarding gender norms and practices highly aligns with the previous literature (Alam et al., 2021; Amin et al., 2021; Zahan, 2021). All these gender norms and practices hamper the female students to achieve their desired results and have immense detrimental impacts on their educational lives.

Agency:

Further, it was revealed that only a few respondents attended online interactive classes or watched the televised classes. However, the number of respondents who watched televised classes was greater than that of the number of respondents attending online interactive classes. This finding also supports the literature where it was mentioned that the ratio of online mode of study was the lowest among adolescents compared to private tuition and other modes of studies (Aziz et al., 2020). Moreover, the study also found that female respondents had an overall greater preference and comfort towards televised classes compared to online classes. This was seen especially in the cases of the rural female respondents. This finding strongly supports the literature which suggests that one-third of girls or less followed televised classes (Amin et al., 2021). However, over the inclination to non-interactive platforms may leave the female students totally unaware of the usefulness and advantages of the interactive platforms.

The findings also suggest that the respondents who had access to digital devices (especially interactive devices) and had better digital capabilities were able to continue their studies even in the school closure period. As a result, they faced lesser difficulties in understanding the class lessons after reopening of the school. Thus, the sheer importance of having access to digital devices and having digital capabilities are quite clear in terms of reducing learning gaps. Moreover, students who had an interest and eagerness towards digital devices were also more aware of the various benefits of online learning such as getting a greater global perspective, saving time which has been mentioned in previous studies as well (Alam, 2020; Gilbert, 2015).

Current situation:

The study revealed that except for the female respondent of Dhaka, the parents of other female respondents are not willing to continue their education after SSC and are preparing to get them married. This would eventually result in an increased number of child marriages and widen the gender gap in terms of education. Therefore, it might hinder Bangladesh Government to achieve SDG 4 in which Bangladesh is already found to have been lagging slightly behind (Thelwell & Law, 2020).

The male students were found to be continuing their education except for the male respondent of the Dhaka urban slum. He is from an extremely poor background and his father met an accident for which he is currently jobless. Thus, the male respondent will get involved in paid work to support his family. In such cases, online learning (if made affordable) could be a great help as it has different advantages such as its flexibility (Alam, 2020). The recordings could be listened at

a suitable time without having a clash with the time of paid work, thus continuing both work and study at the same time without going through a discontinuity.

Chapter 6: Concluding remarks and policy implications

This study aimed to explore the impacts of the digital divide on the educational lives of secondary students across genders and geographical locations. The findings revealed that there are various dynamics of digital access and digital capability divide and these are impacting the educational lives of the students quite differently. It is seen that female students are being impacted in a different way and the difference is depending on several factors such as societal norms, cultural practices, etc. On the other hand, male students are being impacted differently such as they may have the capability but do not have the access due to economic constraints. Besides, different locations have different aspects for instance availability of electricity, etc. Moreover, it has been seen that the priorities, preferences, cultural practices, etc. vary vastly across genders, geographical locations, and socioeconomic backgrounds. Thereby, it is a sheer necessity for the policymakers to understand the various dimensions of the causes and impacts of the digital divide, the relation of digital access divide and digital capability divide and adopt a holistic approach to reduce the divide and achieve inclusive education.

The Key Informants of this study discussed possible ways which include making the internet and its supporting structures affordable to all the socioeconomic classes throughout the country so that basic online learning could be ensured. Moreover, the GoB can initiate live classrooms and also set up a system where lessons would be uploaded for the convenience of the students so that

electricity failure or other factors could not hinder their educational lives. Moreover, there could be a dedicated channel for education that will help promote remote learning nationwide.

It was found in the study as well as in the previous literature that despite numerous initiatives by the Government of Bangladesh, most of the schools and teachers were not ready for online learning. Thus it is extremely necessary to arrange training for teachers so that they get well equipped in terms of digital literacy for online classes. Besides training the teachers, special focus needs to be given on building awareness about the usefulness and benefits of online learning especially in the rural areas where students' especially female students' educational lives are being hampered due to many negative cultural and gendered practices which prevent them from having a broader perspective regarding online educational platforms. However, for all these solutions to be implemented properly, the Government needs to increase the budget for education otherwise it might be slightly difficult to fulfill the SDG-4 target especially after this Covid-19 situation where already numerous students' educational lives had been hindered. To mitigate and cover-up this gap, policymakers must take special measures by understanding the detailed dynamics of digital access and digital capability divide, and in what ways and for what reasons it is having an impact on the educational lives of the students, especially the secondary school students in Bangladesh.

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Appendix:

Guideline for the qualitative interviews:

1. Background information (of the respondent)

- Respondents' name
- Age
- Sex
- Education level
- Occupation (if any):

2. Family members' background information: (questions for the guardians- only section 2 is dedicated to the guardians, the rest of the sections will be asked to the respondents)

- Marital status? Number of family members? Age? Where they live now? What they do? Are any of your children married? When did she/he/they got married?
- Respondent's father's occupation

- Respondent's mother's occupation
- Respondent's father's monthly income
- Respondent's mother's monthly income
- Can you tell me if there have been any changes in your family since Covid-19 started? In what ways did the changes occur? (Sickness/ death, changes in parental occupation, loss of job, changes in income, food intake, indebtedness, expenditure)
- Did the education expenses for your children/child during the school closure period increase or not?

3. Current scenario

- Can you tell me if there have been any changes in your family since Covid-19 started? In what ways did the changes occur?
- In which class do you study now?
- Are you going to school after reopening?
- How many hours do you study? Before, closure period and after reopening?
- If the answer is yes, then:
 - Do you feel the same motivation to study as before Covid-19?
 - Are you being able to understand the studies clearly?

- If the answer is no, then this will lead to the following questions:
 - Why are you not going to school? Prob: Are you involved in paid work or is it because of lack of motivation or there are some other reasons?

If the answer is lack of motivation, then:

-Why do you feel less motivated? prob: Is the difficulty in accessing and/or using the digital devices the main cause behind your motivation loss?

4. Education (during the school closure period): Interactive and non-interactive (if they have both system then ask about both)

- Did you continue studying while the school was closed? If yes, then:
 - How did you study? Through online, TV, radio, self-study or private tutor?
 - **If interactive then-**
- Do you have the internet at your home? Or you use mobile data or travel to other locations such as use cybercafé or other means to use the internet?
- Do you have a digital device in your home? To whom did that device belong? Is it of your own? Prob: Your family members? Neighbors or friends or others? Do you have access to digital device from any other place?

- For how long could you use other family member's device? Did they allow you or not? If no, why they did not allow you? What was the reason behind it?
- If yes, then how many are there? What are/is the type/s of device/s (feature phones, smartphones, tab, laptops, computers, etc.)?
- If yes, then what device it is? Which digital device did you use to attend the online classes? Which online medium did you study through? Prob: Whatsapp, Messenger, Zoom/ Google meet/ youtube other online class platforms?
- Do any of the other members of your household use the devices for study purpose? If there is only one device, do you have problems in adjusting or sharing the device (for example both of your classes are at the same time)?
- Did you do group studies online? Through which online platform do you do that? Was it helpful in understanding the lessons better?
- Was the internet connection sufficient for your online classes and other educational activities such as assignment submission or having access to necessary study materials?
- What are the problems that limit your access to online and digital devices for your study? Prob: Do you have access to electricity? For how long do you get electricity in your home? Did it hamper your study and classes?

Non- interactive:

- Through what medium did you study? TV, radio, etc? How many TV/radio do you have at your house? Did you get permission to use those medium for study purpose? For how long could you use it?
- Could you use those devices properly? Could you find the correct TV channels or radio channels and join your classes on time? Difficulties understand the lesson? Could you do by yourself or did you get help from your family members?

If the respondent did not continue their study, then:

- Why did you not continue? What are the main reasons behind the discontinuity of your study? Prob: operation of the device/ find correct TV channels or radio channels and join your classes on time/Difficulties understand the lesson/ not getting help from your family members?

5. Digital Capability:

Interactive:

- Can you read and send text messages with your smartphone or feature phone? (if you are using any)

- Can you browse the internet on the phone, computer, laptop, tab? (both applicable for having own device or using others)? In what purpose do you use the internet?
- Do you have your own email account? Or other family members? Can you receive, read and send email?
- Could you submit your homework or assignment to your teacher through email (if the classes had provisions for assignment and homework online)?
- Could you join/login into your online classes on your own or take help from someone? Who helped you in this regard? Is that person the most digitally able person in your household?
- Could you browse/ search for study materials online or was it difficult for you?
- Did you have online class tests or exams in your school? How did you attend those? How was it? Prob: Was it easy or difficult? Could you do it by yourself?
- If the answer is difficult: Did the difficulties in using the devices make you demotivated to continue studying regularly?
- Can you make audio and video calls online? Did you ever make video calls for educational purposes? Was that helpful?
- What did you find the online classes overall? Prob: easy or difficult? If you could get proper training for online classes, would that have be helpful for you? Prob: would that motivate you to continue your study?

Non-interactive:

- Online classes or classes after reopening of schools- which seems better to you and why?

If the respondents did not attend any online classes (neither interactive nor non-interactive) :

- How did you continue your studies during school closure period? Self-study or private tuition?
- Did you visit your tutor's place or your tutor came to your home?
- For how many days a week did you took tuition? For how many hours? For how many months did you continue to take private tuition?
- Do you have any friends, relatives, neighbors or anyone you know who have attended online classes? Through Zoom, Whatsapp or attended televised classes?
- If yes, then what did they tell you about it? Have they been benefited from those classes?

➤ Do you think if you could study online it would have been much beneficial for you?

Do you think it would have been better than your private tuition? Do you think it would have been less costly or more?

➤ Have you ever used any of your friends, relatives or someone else's smartphone?

Do you have any idea about accessing study materials online?

➤ Do you think having access to study materials from the internet would have been very much helpful and beneficial for you?