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Emotional Well-Being in the Time of COVID-19: A Tale of Two Factors—Academic and Structural

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ABSTRACT

In this paper we documented the emotional impact of Covid-19 on Pakistani college/university students as they transitioned (rather quickly) from physical (face-to-face) to online classes; we investigate how academic/structural factors contributed to positive/negative emotional reactions among these students and show how the presence of these factors made the transition easier for some students and not so much for others. We use mixed-methods research, including an online survey instrument supplemented with focus group discussions. Pakistan has a stratified education system divided along lines of income /class. Unfortunately, online learning exacerbated existing inequalities and laid bare the stark digital divide. Our research confirms that students across all income brackets want similar things: synchronous lessons and an uninterrupted internet connection to listen to these lectures without voice distortion -- a supportive environment/infrastructure at home, and at the university (Student Affairs, IT support) reduces stress and allows students to focus on the lecture; they expect to be examined objectively and fairly, based on merit. Uneven access to these academic and structural determinants, however, added stress, anxiety, and frustration. Moreover, keeping everything else constant, being female is associated with greater anxiety and frustration: This is especially true for high-income girls; however, low-income female students reported hope in the face of adversity.

Keywords: COVID-19, Online Learning, Education, Pakistan, Gender
JEL Classification: I23, I24, J16

INTRODUCTION

The recent COVID-19 pandemic and its response (in the form of spatial distancing guidelines, home quarantine, and school/work closures) led to a disruption in social support networks when these were needed the most, affecting people of all age groups across the globe, both physically and psychologically. Brooks et al (2020) inform that quarantine's psychological impact is wide-ranging, substantial, and may be long-lasting (Brooks et al 2020).[1]

This paper documents the emotional impact of the pandemic on college students. In the wake of rising cases and no pharmaceutical solution, most countries had no choice but to rapidly move to e-learning; however, given that not all young people have equal access to the internet and to technology, with an important minority completely excluded (Williamson et al, 2020), this 'digital divide' manifested in a scenario whereby universities in developed countries were better prepared for this transition (Abdrasheva et al., 2020), while universities in the developing world struggled (Nurunnabi et al., 2020).[2] Even within developing countries, intra-country differences were observed with better-equipped elite private universities transitioning to e-learning more smoothly than their lower-income counterparts (Abdrasheva et al., 2020).

We specifically document the emotional impact of Covid-19 on Pakistani college/university students as they transitioned (rather quickly) from physical (face-to-face) to online classes; we investigate how academic/structural factors contributed to positive/negative emotional reactions among these students and show how the presence of these factors made the transition easier for some students and not so much for others, and carries recommendations for institutions to support these students in the aftermath of the pandemic and to focus on their preparedness for future emergencies. Now, post-COVID educational planning demands an urgent re-evaluation of the inclusivity of our educational system, with special focus on female learners.

We use online survey data collected from 1457 respondents from Pakistani colleges/universities in August–September 2020. This is a precious sample – according to the Pakistan Economic Survey 2021-23, while 11.35 million students are enrolled in pre-primary education and 25 million in primary education, this number tapers to only 2.78 million students in higher education institutes[3], suggesting that only a small fraction of students enrolled in primary education make it to college/university. We include both universities and colleges (mostly degree-awarding) in our sample. [4] However, for ease of presentation, we will use the term high, middle, and low income universities – albeit some subgroups include colleges as well.

Our main dependent variables are emotional health-related variables (joy, hope, frustration, anger, and anxiety). Our primary explanatory variables include

structural variables such as infrastructural facilities available at home (including access to a quiet place, mic/ headphones, laptop, and stable internet connection) to take online classes; and support services provided by the university, such as extra help from faculty, IT department, and student affairs. Academic variables include the nature of lectures available to students (synchronous or asynchronous), assignments, and the amount of workload. Using an ordered logistic regression, we confirm a significant impact of these academic/structural determinants on the positive/negative emotional reactions of college students, while controlling for socio-demographic variables such as age, gender, household income, assets, and number of rooms. We confirm that, about academic determinants, synchronous lectures, instead of recorded, elicit positive emotions, and so do lower numbers of assignments. With respect to structural determinants, university support, and access to appropriate infrastructure at home for taking online classes are associated with positive emotions. However, there is a significant divide between high versus low/middle income universities, not only in terms of the academic facilities available, but the structural differences are significant. Students in high-income universities only receive synchronous lectures, while in the case of middle/low-income universities, synchronous lectures were rare, and even when available, an interrupted internet connection made it difficult for the students to understand everything. In addition, access to a separate device to take online classes, a separate room where they could focus, mic to participate in online classes was rarely available to low- and middle-income university students. Hence, in the absence of a level playing field, the transition to online classes resulted in a heterogeneous impact across university types.

We also confirm that being female manifested in more anger, anxiety, and frustration among college students, but at the same time, in middle/lower middle income girls was accompanied by hope (i.e., perceived ability to achieve goals), confirming their resilience in the face of adversity.

Background

Educators agree that given emotions exist comprehensively in the human experience, to ignore emotion in the human response to internal and external events is to ignore a central element of the human experience (LeDoux, 1996; Plutchick, 2003; Stets & Turner, 2006; Wosnitza & Volet, 2005). Emotion, therefore, cannot be considered separate from the learning environment (Brookfield, 2006; Lehman, 2006; Lipman, 2003). This is especially true with reference to the adjustment process that occurs as students move online.

While new technologies are often expected to make work easier, they also involve the development of new competencies: the online learner may experience negative emotions during the adjustment process, which could interfere with the learning experience. (Cleveland-Innes & Campbell, 2006). Hence, thoughtful consideration of emotions and possible facilitation strategies in response to negative emotions during the online adjustment process is recommended both at the design stage of the course material, teaching, and online learning.[5] Emotions are thought to

influence important components of learning processes, such as attention, motivation, and use of learning strategies, as well as resulting learning outcomes (Baumeister et al, 2007; Fredrickson, 2001; Pekrun & Perry, 2014; Zeidner, 1998).

Theoretical Framework -- Social Cognitive Theory

Rahmat (2018) argues that while it is critical to adopt correct learning strategies, the learning process is facilitated by the surrounding learning environment. Effective learning takes place when the environment, behavior, and cognition work together. Bandura (1977) confirms that social cognitive theory is a learning theory that emphasizes the environment the learners experience, and how it contributes to their behaviour and, in turn, their emotions. The theory focuses on the interaction between personal, behavioural, and environmental factors in shaping human experiences and behaviours. In the context of online learning during the COVID-19 pandemic, Social Cognitive Theory (SCT) can help explain how infrastructural facilities, support services, and academic variables impact students' emotional well-being, including feelings of hope, frustration, joy, anger, and anxiety.

Access to adequate *infrastructural facilities* (e.g., quiet places, laptops, microphones, and stable internet) provides students with the tools they need to engage fully in the learning process and eventually enhance their self-efficacy. This belief in their ability to succeed leads to increased hope and reduces feelings of frustration and anxiety. The availability of proper infrastructure increases the likelihood of successful learning outcomes, reinforcing positive outcome expectations and fostering joy and satisfaction when students can effectively engage with their coursework. (Figure 1 in the annex summarizes this conceptual framework).

Support services also act as a critical environmental factor that influences students' emotional well-being. Support like feedback, IT assistance, counselling, and academic support help boost student self-efficacy and enhance emotional well-being by reducing feelings of frustration, anxiety, and isolation.

Similarly, *Academic variables* such as the structure of lectures, workload, and the types of assignments students receive create a dynamic interaction with their emotional states and academic behaviours. For example, high workload or unclear assignments can increase anxiety and frustration, leading to disengagement from learning, while a well-structured, manageable workload promotes engagement and joy.

In the case of the type of learning, Synchronous learning allows for real-time interaction, which can enhance social learning and relatedness, a key component of SCT. This can increase feelings of connection and reduce feelings of isolation, leading to increased self-efficacy and hope. However, synchronous learning may also create stress or anxiety for students who feel overwhelmed by the pressure to participate in real-time. This pressure may reduce their self-efficacy, leading to frustration or anxiety. Asynchronous learning, on the other hand, offers flexibility, which may alleviate anxiety for some students. However, the lack of real-time interaction can lead to feelings of isolation and disengagement. In social cognitive

terms, this reduces opportunities for observational learning and social interaction, which may lower motivation and self-efficacy. The flexibility of asynchronous learning may increase students' feelings of autonomy and reduce anxiety, but it may also lead to feelings of isolation, reducing joy, and increasing frustration if students feel disconnected or lack the motivation to keep up.

The above discussion explains that the core component of social cognitive theory, self-efficacy, can significantly influence emotional well-being. When students feel capable of succeeding in online learning due to access to proper infrastructure, support services, and manageable academic variables, their emotional state improves (increased hope, joy). Low self-efficacy, caused by inadequate support or overwhelming academic demands, leads to negative emotions such as frustration, anxiety, and anger.

LITERATURE REVIEW

With the pandemic, however, there was no time for adjustment or facilitation strategies to transition from face-to-face to online classes. This meant a complete transition from conventional to digital learning, resulting in challenges for both teachers and students. On the one hand, it was now imperative for teachers to adopt innovative teaching methodologies and understand the online teaching/learning process to design effective interventions for the smooth running of the learning process. At the other end, students now had to stay home and take online classes. Although students, on average, are not considered the most "endangered" group as far as the *physical health* aspects of this pandemic are concerned, however, *emotionally* they remain vulnerable due to the pandemic's impact on their daily life, and the delays in academic activities (Cao et al., 2020).

University students generally lead an active life encompassing physical and university-related activities, including socialisation with peers and teachers. The lockdown and its restrictions led to a drastic change in their lives, particularly their emotional health in terms of emotional reactions and concerns for family and friends (Villani et al., 2021). During the COVID-19 pandemic, students experienced psychological distress related to high anxiety, depression, low sleep quality, and stress, which reduced life satisfaction and personal well-being as a whole (Duong, 2021; Evans et al., 2021; White, 2021).

Aristovnik et al. (2020) conducted a global study investigating how students from 62 countries perceived the impact of the first wave of COVID-19 on various aspects of their lives. The findings show that students with certain socio-demographic characteristics (male, part-time, first-level, applied sciences, a lower living standard, from Africa or Asia) were significantly less satisfied with their academic work/life (future professional career and studies) during the crisis, whereas female, full-time, first-level students, and students faced with financial problems, were generally affected more by the pandemic in terms of their emotional life and personal circumstances (Abedeen et al., 2024; Shabeer et al., 2024a; Shabeer & Rasul, 2024a).

Additionally, other studies have focused on a single country or even a single university (e.g., from South Asia: China (Cao et al., 2020), India (Kapasia et al., 2020), Pakistan (Adnan & Anwar, 2020), or on a single academic field (e.g., medical students from Iran (Taghrir et al., 2020), Philippines (Baticulon et al., 2021), Saudi Arabia (Meo et al., 2020), and Turkey (Aker & Mıdık, 2020) and nursing students from England (Swift et al., 2020), Israel (Savitsky et al., 2020) and the USA (Morin, 2020). Cao et al. (2020) investigate the mental health status of college students in China based on a questionnaire comprising a 7-item Generalized Anxiety Disorder Scale. The results showed that most of the students faced mild anxiety, and those living in urban areas, with family income stability, and living with parents were less anxious. Correlation analysis confirms that economic effects, effects on daily life, as well as delays in academic activities, are positively associated with anxiety symptoms, whereas social support is negatively associated with anxiety. Similarly, Elmer et al (2020) conducted a longitudinal study with Swiss undergraduate students, analyzing change along multiple dimensions of social networks and mental health indicators (such as depression, anxiety, stress, and loneliness), and confirmed that students' stress, anxiety, loneliness, and depressive symptoms have gotten worse since the crisis.[6] Moreover, females were reported to be doing worse than males. (Elmer et al., 2020; Shabeer & Rasul, 2024b; Shabeer, 2024).

In the specific context of Pakistan, Adnan and Anwar (2020) conducted a study of 126 graduate and postgraduate students from the National University of Sciences & Technology (NUST) to analyse the effectiveness of online learning. They highlight challenges faced by students in terms of appropriate infrastructure (internet connectivity) and also monetary issues. Students were not satisfied with the instructor's response time and missed traditional classroom socialization. However, this study is limited to only one university in a heterogeneous Pakistani educational landscape, fragmented not only by rigor in the material taught, but also by class and social status.

The main aim of our study is to fill this research gap by investigating the effect of structural and academic factors that influenced the transition of students from face-to-face to online classes and their overall experience when the lockdown was imposed, including determinants of students' emotional state during this time of crisis. As mentioned above, structural factors include support services received from the university, infrastructural support available at home for online classes, while academic factors include, mode of teaching, presentation of material, and amount of workload. We disaggregate the analysis by the type of university (high-income private institutions, middle-income public/private institutions, and low-income public institutions) to examine the heterogeneity due to variation in social class and university facilities available.

We move the literature forward by drawing on a larger sample of college/university students representative of these categories of higher institutions. Students in these distinct streams of higher education differ in the kind of

curriculum and teaching methodologies they are exposed to, the amount of technology incorporated in the classroom, and the skill level of teachers in using ICT for delivering lectures. Moreover, student behaviour and emotions also differ across the type of universities, including preferences regarding trust, cooperation, and punishment (Aftab, 2021; Delavande & Zafar, 2011; Shabeer et al., 2021c). We further disaggregate our analysis by gender to better understand how the online experience differs for girls and boys in a gendered society such as Pakistan.

We employ a mixed-methods approach where students were asked to fill out an online survey, and then a group of them was selected for focused group discussions. Our survey instrument asked university students about their experience regarding different online platforms for teaching/learning, including their satisfaction with the organization and support of their institutions after the cancellation of on-site classes. Moreover, we asked students questions regarding their emotional well-being to get an idea of how they were coping in this new environment. We supplemented this survey data with focus group discussions to better understand the nuances in terms of how student experiences with online classes differ by social/income class and gender; we want to especially get at gender differences in terms of feelings of anxiety and frustration, and tease out why girls are more prone to anxiety than their male counterparts. We confirm that Pakistani female students (especially the ones belonging to the higher-income group) feel more anxious than their male counterparts in the wake of online teaching,

Empirical Methodology and Results

Questionnaire and Data Description

The data was obtained through a web-based comprehensive questionnaire composed of 58 questions covering socio-demographic, geographic, and different elements of online education during COVID-19. The first section asked respondents about their socio-demographic and academic characteristics (age, gender, city, region, institution of study, level and field of study, household income, and other household characteristics). We also asked students about their experience regarding online teaching during COVID-19. This section included questions covering the infrastructure and skills required for studying from home, including four questions on the conditions for studying from home, such as workspace, equipment, internet connection, and office supplies. The segment also included 21 questions on how the COVID-19 pandemic had affected their experiences and challenges, including specific questions on the new forms of teaching methods adopted in universities and the level of student satisfaction. There were also questions based on their experiences with teachers, assessment and workload, teaching and administrative support, as well as their own performance and expectations. This was followed by four questions mainly focusing on students' emotions, mental health, and social life since the outbreak of the pandemic. Lastly, the questionnaire ended with a few open-ended questions trying to explore what other problems students might face during online classes and if they had suggestions/recommendations on how their e-learning experience may be improved.

Data Description

The sample comprised 1457 respondents, of whom 58.8% were females. Most of the students were day scholars (82%), undergraduate (62.0%), with 259 students from high-income universities, 627 students belonged to middle-income universities, and 571 students were from low-income universities.

As shown in Table 1 (Appendix 1), more than half the students in low-income universities (62%) belong to the bottom 20% of the households in terms of income, as compared to only 5% in high-income universities, followed by 15.8% in middle-income universities. Whereas, students from the top 20% of the households (in terms of income) were mostly enrolled in high-income universities (37.4%), as compared to middle-income universities (13.1%), and low-income universities (1.05%). Further, the majority of our respondents lived in urban areas (78.7%).

Infrastructure and Surroundings for Online classes

We were interested in investigating the infrastructure available to students at home to ensure efficient online study. According to our survey, onsite classes were closed for 88.5% of the students sampled, which meant shifting to taking classes at home, where having a good internet connection was essential. 61.4% of the students from higher-income universities reported uninterrupted internet connectivity, followed by middle-income universities, where less than half of the students (42.1%) had uninterrupted internet connections, and then low-income universities, where 31.2% reported uninterrupted internet. Moreover, 27.3% of students from the low-income universities reported no internet connectivity in their hometown. Students were also asked which device they used for taking online classes: smartphone was the most popular choice for middle-income (52.8%) and low-income university students (87.6%); however, more than 60% students attending high-income universities used a laptop or desktop computer (see table 2, appendix 1). While more than 90% of the students in high / middle-income universities themselves owned the device they used to attend online classes, the percentage in low-income universities was much less (61.5%). Moreover, 29.3% of the students in the low-income and 13.6% in middle-income universities reported having taken classes in the presence of other family members, whereas this number was much less for high-income universities (3.1%).

With respect to access to software programs (such as Zoom and Microsoft Office), around 97% of high-income, 92% middle-income, and 83 percent low-income university students could access these programs. This is followed by access to office supplies (e.g., notebooks, pen) and headphones/microphones: Students in high-income universities were most likely to have access to a webcam (80.7%), followed by students in middle-income (59.5%) and then low-income universities (24%). Access to printers was the least common among all university students.

Academic support during online classes

The shift from onsite learning to online learning in a developing country like Pakistan was a new experience for almost all universities. Since the transition was quick, the universities did not have enough time to prepare. In addition, students

from underdeveloped rural areas had problems with poor internet connectivity. Therefore, if we look at our survey results (figure 1 in appendix 2), the level of satisfaction from the university Teaching Staff, Technical Support/IT and Library services was the highest for the high-income universities (3.24, 3.06 and 3.00 respectively) and the least for low-income universities (2.87, 2.48 and 2.2 respectively) further, emphasising the income divide.

As mentioned above, effective online learning is determined by many factors, including the way the learning material is designed and prepared, the instructor's manner of delivering the lecture in an online environment, and their interaction with students (Bao, 2020; Sun, 2016; Wu & Liu, 2013). As shown in Figure 2 (appendix 2), while the most common form of lecture methodology was synchronous (real-time video lectures) within each university, asynchronous (recorded video/audio) lectures were most frequent in low-income universities. The level of satisfaction among students vis-à-vis teaching methodology was greater for synchronous as compared to asynchronous across all universities. Among other methodologies adopted (table 2, appendix 2), PowerPoint presentations were the most common, followed by assignments and then written notes in both middle- and high-income universities. However, for low-income universities, assignments were the most common (55.9%), followed by written notes (25.0%), while PowerPoint presentations were the least likely (14.19%). These results may be expected, keeping in mind the computer and IT skills of the teaching staff and the availability of teaching resources in low-income universities.

Further, the instructor's interaction with students and the way they respond to students' questions and provide performance feedback is crucial. Therefore, students were asked about their instructor's responsiveness and their openness to student suggestions. With respect to providing timely feedback on assessments and responding to questions promptly, the score was highest among low-income universities. Similar results were found for instructors being open to students' suggestions. A possible explanation for this could be the smaller scale of the institution and small class sizes in these low-income universities, which made communication with the instructor much easier.

Further, students were asked to compare their workload before onsite classes were cancelled (Figure 3, Appendix 2). Across all universities, students felt that their workload had become significantly larger post-COVID. Lastly, students were asked about their level of focus during online classes. Students from high and middle-income universities faced the most difficulty in focusing during online classes, whereas students from low-income universities faced the least difficulty. This could be a reason why (as shown in Table 2, Appendix 1), around 60% of students from high- and middle-income universities felt that their class participation had decreased during online classes (compared to 46.4% reported by low-income university students). The reasons for this reduced participation differed across university type: Students in high-income universities felt that their class participation had reduced because of a lack of confidence and background noise, followed by internet

connectivity. In the case of middle- and lower-income universities, the most likely reason identified was internet connectivity. Also, the lack of access to adequate infrastructure, especially mic, reduced class participation in online classes for the students belonging to low-income universities.

Emotional well-being

The outbreak of the COVID-19 pandemic impacted the psychological well-being and mental health of people across the globe (Brooks et al., 2020; Hamza Shuja et al., 2020; Pan, 2020; Wang & Zhao, 2020). Similarly, as mentioned above, students also experienced many psychological pressures impacting their daily life, especially economic and academic pressures (Cao et al., 2020). In our study, overall, less positive emotions (joyful and hopeful) and more negative emotions (frustrated, angry, and anxious) were experienced by students. Table 3 (Appendix 2) presents the summary statistics vis-à-vis the positive/negative emotions experienced by students, disaggregated by university type: female students in high-income universities felt more negative emotions (frustration, anger, and anxiety) and less positive emotions (joy and hope). In the case of middle-income universities, again, female students elicited more negative emotions; however, with respect to positive emotions, although male students were more joyful, females were more hopeful. In the case of low-income universities, female students experienced both greater negative as well as positive emotions. This complex mix of emotions felt by middle- and low-income female students is teased out further in our focus group discussions. Further, students were also asked if they had to leave their dwellings during the pandemic lockdown and why. As shown in Figure 5 (Appendix 2), grocery shopping was the most popular reason across all university types, followed by visits to friends and family.

Empirical Methodology

In this section, we empirically examine the effect of structural and academic factors on the emotional state of students during online classes. The survey asks about five emotional states: joy, hope, frustration, anxiety, and anger.[7] For simplicity, for the empirical analysis, we construct binary variables that take the value of 1 if the student feels any of the respective emotions *sometimes, often, or always,* and 0 if it is *felt rarely or never*. Since the dependent variable is binary, we use the logit model with standard errors clustered at the university level. Thus, the probability of an individual i studying in an institution h to elicit the emotion (j) is given by:

$$y^*_{j,ih} = \alpha + \delta_j x_{ih} + \beta_j z_{ih} + \epsilon_i$$

where $^*_{j,ih}$ is the latent variable representing the individual's emotional state, x_{ih} Is the vector of explanatory variables (structural and academic), and z_{ih} are individual and household-level controls; ϵ_i Is homoscedastic, normally distributed stochastic error terms. The primary explanatory variables include structural and academic variables. Structural variables include infrastructural facilities available at home, such as access to a quiet place to take online classes, access to a microphone and headphones, access to a laptop, and a stable internet connection. In addition, they include support services provided by the university, such as extra help from faculty,

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the IT department, and student affairs. Academic variables include the nature of lectures available to students during online classes (synchronous or asynchronous), the number of assignments, and the amount of workload. Control variables include socio-demographic variables such as age, gender, household income, assets, and number of rooms.

RESULTS AND DISCUSSION

The empirical estimates of the model given above are discussed in this section. The determinants of the emotions elicited by students during online classes are disaggregated by institution type as given in Tables 4-6 (Appendix 3): Models (1) and (2) report the determinants of positive emotions, joy and hope respectively, and models (3), (4) and (5) report the determinants of negative emotions, namely frustration, anger and anxiety. Table 4 reports the marginal effects of the logistic regression on the positive and negative emotions of students belonging to High Income Universities (HIU). It is noted that an increase in age is associated with positive emotions like joy and hope, and simultaneously negative emotions (frustration and anger) possibly because with age, individuals appear to become more sensitive to their environment. Female is significantly associated with negative emotions, such as frustration, anger, and anxiety. In terms of teaching methodologies, all students in high-income universities received synchronous lectures, and no variation was found. In addition, they also received assignments that reduced joy and increased frustration and anger in them.[8] Of all the university services, the quality of teaching staff significantly impacted student experience. Improved teaching quality is associated with a reduction in negative emotions. In terms of infrastructural facilities for online classes, access to wifi, internet connection, a smartphone for taking online classes, and access to a desk and study materials were associated with an increase (decrease) in the probability of positive (negative) emotions.

The mobility and socializing indicators show that going out for groceries (a necessity) is associated with negative emotions; in contrast, shopping (a luxury) reduces frustration. Concerning meeting friends and family, we observe conflicting emotions of joy and anxiety, which can be explained from our focus group discussion, where students mentioned that, of course, they were happy to see friends and family, but at the same time, they were anxious that the elders in their household would not get exposed to the virus.

Having an internet connection (interrupted or uninterrupted) reduced negative emotions; while access to mobile data not only increased joy, but also reduced the probability of the student feeling anxious during class. This could be explained by the fact that in case of power outages, mobile data proves to be a reliable backup. The basic infrastructure required for online classes, such as a desk, webcam and study material is also positively associated with positive emotions and negatively with negative emotions.

University services are an essential component that played a critical role in

these uncertain times. We observe that higher satisfaction with the teaching staff elicited positive emotions in students. Moreover, issues of concentration and lack of focus during online classes is negatively associated with positive emotions like hope.

Overall, we find that in high income universities, older students, and female is associated with negative emotions (frustration, anger and anxiety), while university support services, especially that provided by teachers, and infrastructure availability at home for online classes, elicit positive emotions (joy and hope). In addition, socialization, or going out, makes these students anxious during the COVID-19 lockdown, even though they miss their friends.

Table 5 reports the determinants of the emotions elicited by Middle-Income University students. In contrast to elite university students, in middle-income universities, with age, students' frustration and anger decrease; moreover, being female, in middle-income universities (in contrast to elite university females), is associated with hope (despite the presence of negative emotions such as frustration, anger, and anxiety).

In terms of teaching strategy, synchronous lectures for online classes increased joy for all students who received these live lectures, as compared to students who instead received written notes, PowerPoint slides, or voice notes over WhatsApp. Assignments added to the frustration, and a larger workload compounded this negative emotion. University services such as teaching staff available to respond to student queries, IT support, and a responsive student affairs department, reduced stress during online mode.

The infrastructural facilities at home might be a limiting factor for these students: Access to the internet and mobile data is expected to minimize stress in students when learning is online; yet, we find that middle-class university students with access to wifi exhibit frustration, anger, and anxiety. Possible explanation could be the quality of the wifi connection available at home: If the internet is interrupted, instead of facilitating the experience, it becomes extremely annoying, leading to negative emotions.

Mobility and socializing during covid COVID-related lockdown have been limited and stressful. Results indicate that students who go out to do groceries find it hopeful, yet it also provokes negative emotions. These students might be hopeful as grocery is a necessity and required for survival, yet going out with the fear of exposure to the COVID-19 virus can create anxiety. Similarly, going out for a walk or meeting family and friends makes students joyful, but yet again, they simultaneously experience anxiety and frustration. Only shopping makes our students less angry, as this is something that they do with their own free will, and treat it as leisure.

To summarize, for middle-income university students, being a male, receiving synchronous lectures during the lockdown, and having access to stable internet, reduced negative emotions. Moreover, like their high-income university counterparts, going out during lockdown manifested mixed emotions: they were happy to go out, yet anxious that they might contract the virus, except for shopping.

Finally, Table 6 reports the marginal effects for the set of logistic regressions estimating the determinants of positive and negative emotions elicited by Low-Income University students during online classes. Similar to middle-income university students, with age, low-income university students also exhibit more frustration; while females, overall, compared to males, are more hopeful, but simultaneously, they also exhibit more frustration than their male counterparts.

Similar to their middle- and high-income counterparts, a larger workload increased frustration in low-income students, while access to teaching staff made them more joyful and hopeful. In addition, access to the internet and mobile data reduced negative emotions of frustration and anger as it allowed them to connect with others and learn through online mode. Also, access to the mic and study material minimized negative emotions. In terms of mobility and socializing, going out for groceries reduced anger, while meeting friends and family made them more hopeful.

To consolidate, given students' emotional reactions and their determinants documented above, it is important to reiterate the gender dimension: across both elite and middle-income universities, we can clearly observe a pattern: being female is associated with negative emotional reactions in the form of higher anxiety, anger, and frustration. A similar pattern is observed among female students at low-income universities, but here, being female is limited to negative feelings of frustration. Previous studies (post-COVID) confirm that risk factors for anxiety include being female (Zhang et al 2020) and that there is a significant correlation between a high level of stress and being female. (Al Ateeq et al, 2020). But despite the presence of these negative emotions, middle and low-income female students also exhibit hope. This underscores their inherent resilience in the face of adverse circumstances.

Further, across all universities, with respect to academic determinants, synchronous lectures (instead of recorded) elicit positive emotions, and so does a lower workload/assignments. With respect to structural determinants, university support, especially from faculty and IT departments, relaxed students emotionally and smoothened their transition to online classes. In addition, access to appropriate infrastructure for online classes is associated with positive emotions. However, there is a significant divide between high versus low/middle income universities not only in terms of the academic facilities available, but structural differences are significant: Students in high income universities only receive synchronous lectures, while in the case of middle/low-income universities synchronous lectures were rare and even when available, interrupted internet connection made it difficult for the students to understand everything. In addition, access to a separate device to take online classes, a separate room where they could focus, mic to participate in online classes was rarely available to low- and middle-income university students. Hence, in the absence of a level playing field, the transition to online classes resulted in a heterogeneous impact across university types.

Focus Group Discussion: Focus groups are conducted to supplement the empirical analysis and better understand the emotions elicited by students across

universities and by gender.[9] There are significant differences in how students feel and cope with the sudden transition to online classes, by university type. During lockdown, being physically restricted within the home has very different implications for students from high vs. low/middle-income universities. While for girls from higher-income universities it meant less socialization and additional household chores, girls from low-income universities didn't complain about a lack of socialization or household chores; rather, their primary issue was a lack of support (from teachers and parents) to conduct academic activities within the home. Students from low- and middle-income universities particularly highlighted the plight of unstable internet connection at home for synchronous lectures; they also mentioned that their teachers were not skilled to conduct live online lectures and their families did not comprehend how the online class system worked.

In addition, there was a lack of discipline amongst teachers and the administration. They would randomly cancel classes without prior notice and reschedule at odd timings (in the evening or on weekends), creating further issues for the students. Lack of empathy from teachers was also a problem faced by students of low-income universities. They would not consider genuine internet issues and refused to accept late assignments. Moreover, they found that everyone got average grades regardless of how much input they gave, which might be a plus for below-average students but extremely disappointing for hardworking students. However, students from high-income universities did not indicate any such problems, and hence, their issue was not the quality of education; instead, it was limited socialization and additional household burden, particularly for girls.

Boys from high-income universities, instead, considered online classes an opportunity, as they had more free time at their hands; they were neither expected to help in household chores (unlike girls), nor contribute towards household business (market-work), like their low/middle-income counterparts. These students instead utilize their time to do internships, freelancing, or start a new venture. In contrast, boys from low-income households were expected to take up full-time jobs or contribute to the family business to add to household income. Many of these are first-generation students, and their parents do not understand how online classes work and what expectations are entailed.

Conclusion and Policy Implications

Unfortunately, online learning has not only exacerbated existing/longstanding inequalities along income, region, and gender, but it has also laid bare the stark digital divide.[10] Our research confirms that students across all income brackets want similar things: synchronous lessons and an uninterrupted internet connection to listen to these lectures without voice distortion -- a supportive environment/infrastructure at home, and at the university (Student Affairs, IT support) reduces stress and allows students to focus on the lecture; they expect to be examined on the material objectively, based on merit. Uneven access to these

academic and structural determinants, however, added stress, anxiety, and frustration. Moreover, keeping everything else constant, being female is associated with greater anxiety and frustration. This is especially true for high-income girls.

While students in high income university only received synchronous lectures, in middle and low income universities synchronous lectures are rare, and even when available (as mentioned above) internet/wifi emerged as a limiting factor for students accessing these online lectures; middle/low-income students also felt that at the end of the teacher delivering the lecture, there was a lot of room for improvement: many of the teachers were teaching as though they were physically giving lectures in the classroom, resulting in a very monotonous and frustrating experience: students desired more interactive and creative interventions such as presentations, videos, research papers etc. Moreover, from our focus group discussions, students confessed that the teacher's lack of trust and empathy added to their frustration; some low-middle-income girls were especially disappointed as they felt everyone was getting similar grades – teachers seemed to be giving average grades to all. This really pulled down good students and added to their psychological stress. But, even in the face of adversity, it is our low/middle-income female students who are more hopeful than their higher-income counterparts.

Epilogue: Five years after COVID-19, higher education institutions remain poorly prepared for another disruption. The pandemic exposed gaps in both access to technology and its effective use, yet little has been done since by the HEC or universities to train faculty in digital tools, improve online pedagogy, or strengthen student counseling services.

Going forward, planning must prioritize investment in educational technology—improving access, internet quality, and digital literacy for both students and teachers. HEC should lead targeted professional development that helps faculty deliver engaging, student-centered online courses (Asher, 2021). Additionally, IT support and student counseling services must be readily accessible on campus and remotely to ensure continuous academic and emotional support.

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Appendices

Figure I: Theoretical Framework – Social Cognitive Theory

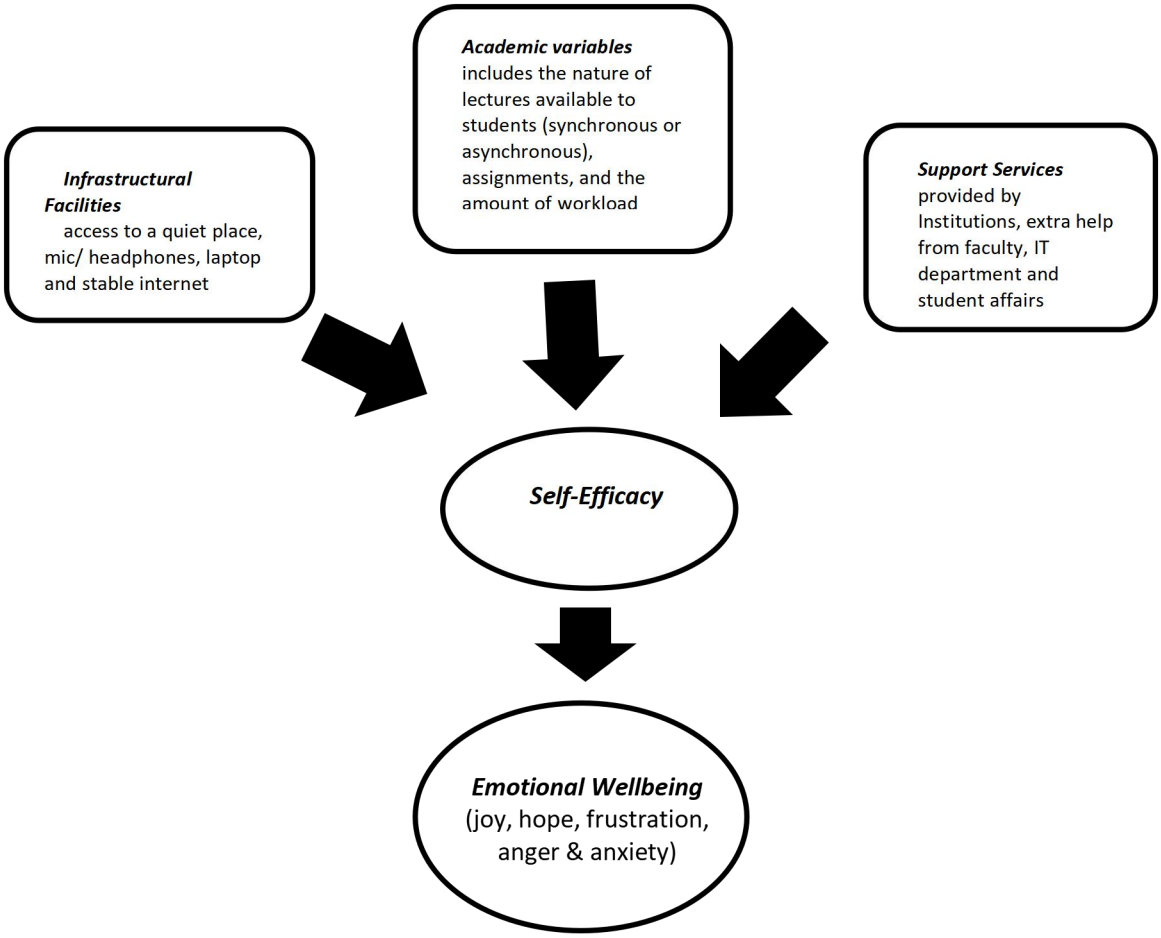

Table 1: Household and Individual-level characteristics by university type

	High Income Universities	*Middle Income Universities*	*Low Income Universities*
	N=259	N= 627	N=571
INDIVIDUAL LEVEL CHARACTERISTICS			
Age	21.29	22.06	18.56
Female	0.43	0.46	0.80
Hostelite	0.17	0.25	0.11
HOUSEHOLD CHARACTERISTICS			
Rural	0.05	0.26	0.23
Household Income			
PKR 25,000 or less	5.02	15.79	62.35
PKR 25,001 to 75,000	13.13	38.92	29.42
PKR 75,001 to 125,000	18.53	22.97	4.90
PKR 125,001 to 200,000	25.48	9.25	2.28
PKR 200,001 or more	37.84	13.08	1.05
Asset Index	0.56	0.53	0.40
No. of Rooms	4.749	4.283	3.480
No. of Household Members Taking Online Classes	2.342	2.259	2.067
Importance of Girls Education	4.718	4.668	4.616
Importance of Boys Education	4.931	4.861	4.758
Owns a Smart Phone	99.61	96.81	70.05
Internet Connectivity			
No	4.25	10.85	27.32
Yes, Interrupted	34.36	47.05	41.51
Yes, Uninterrupted	61.39	42.11	31.17
Mobile Data	84.17	77.35	64.62

Table 2: Structural and academic characteristics by university type.

	High Income Universities	*Middle Income Universities*	*Low Income Universities*
	N=259	N= 627	N=571
INFRASTRUCTURE AND SURROUNDINGS			
Classes taken on Smartphone	34.36	52.79	87.57
Owns the Device Classes are Taken On	91.51	88.68	61.47
Student has Own Email Address	99.61	97.93	70.75
Classes taken in Presence of other Family Members	3.09	13.56	29.25
Access to Following:			
A quiet place to take classes/study	67.57	55.82	64.62
A desk	75.29	48.64	26.27
A printer	37.45	21.53	10.16
Headphones and microphones	95.37	87.88	68.83
Webcam	80.69	59.49	24.17
Office supplies (notebooks/pens, etc)	96.91	89.79	81.09
Required software and programmes (Zoom, Microsoft Office, etc.)	97.68	92.19	83.19
Course study material (e.g., compulsory and recommended literature)	76.45	76.56	77.58
TEACHING METHODOLOGIES AND SATISFACTION			
Form of Online Lectures			
Synchronous	98.84	93.78	69.88
Asynchronous	1.16	5.9	29.77
No Online Lectures	0	0.32	0.35
Satisfaction with Respective form of Online Lectures			
Synchronous	2.703	2.519	2.499
Asynchronous	2.333	2.622	2.465
Other Methodologies Employed for Teaching			
PowerPoint Presentations	46.72	48.80	14.19
Assignments	45.95	31.90	55.87
Written Lecture Notes	5.02	14.35	25.04
Satisfaction with Respective Other Teaching Methodologies			
PowerPoint Presentations	3.231	3.108	3.321
Assignments	2.588	2.835	3.266

Written Lecture Notes	3.692	3.1	3.217
Were provided course assignments (e.g., readings; homework; quizzes) on a regular basis	4.382	4.027	3.837
Have provided feedback on my performance on given assignments	3.124	3.394	3.757
Have responded to my questions in a timely manner	3.641	3.799	3.968
Have been open to students' suggestions and adjustments of online classes	3.498	3.585	3.790
Have informed me on what exams will look like in this new situation	3.741	3.574	3.704
Workload during Online Classes			
Larger	71.43	59.01	45.36
Same	11.58	22.65	28.37
Smaller	16.99	18.34	26.27
Satisfaction with University			
Teaching Staff	3.239	3.095	2.867
Technical Support or IT Services	3.063	2.691	2.481
Library	2.985	2.116	2.150
Student Affairs Office	2.697	2.377	2.214
Student Counselling	2.595	2.228	2.479
Finance and Account Office	2.665	2.408	2.315
ISSUES WITH ONLINE CLASSES			
Is it more difficult for you to focus during online classes in comparison to face-to-face classes?	4.154	4.024	3.525
Change in Class Participation			
Increased	19.31	16.59	20.49
No Change	20.85	22.97	33.10
Decreased	59.85	60.45	46.41
Reason for Reduced Class Participation			
Lack of access to Mic	1.759	2.281	2.452
Internet connectivity issues	2.763	3.185	3.159
Due to background noise in the house	2.972	3.092	2.729
Lack of confidence	3.056	2.521	2.389

Table 3: Summary Statistics For Emotional Wellbeing By University Type

	High Income Universities	*Middle Income Universities*	Low Income Universities

	N=259	*N= 627*	*N=571*
Emotions			
Joy	0.44	0.40	0.39
Frustration	0.75	0.69	0.49
Anger	0.68	0.64	0.47
Anxiety	0.70	0.69	0.50

Note: Responses range from 1= not at all to 5= most Often.

Figure 2: Percentage Of Students Eliciting The Positive And Negative Emotions By Gender And Institution Type

Table 4: Marginal Effect of the Logistics Regression on Positive and Negative Emotions of High-Income University Students During Online Classes

VARIABLES	(1) Joyful	(2) Hopeful	(3) Frustrated	(4) Angry	(5) Anxious
Academic Environment					
Assignments	-0.135**	0.0365	0.149**	0.204**	0.129
	(0.0671)	(0.103)	(0.0708)	(0.0832)	(0.0807)
Larger Workloads	-0.006	0.002	0.020	0.084	0.094*
	(0.033)	(0.037)	(0.021)	(0.052)	(0.056)
Teaching Staff[3]	0.098***	0.141***	-0.049***	-0.093***	-0.032***
	(0.009)	(0.021)	(0.016)	(0.015)	(0.012)
IT Support[3]	0.011	0.026	0.021	0.006	0.025
	(0.016)	(0.026)	(0.033)	(0.033)	(0.022)
Student Affairs[3]	-0.003	0.011	0.005	0.008	-0.004
	(0.013)	(0.014)	(0.015)	(0.015)	(0.010)
Infrastructural Facilities					
Used Smartphone for Online Classes	0.110**	0.083	0.022	0.038	0.019
	(0.054)	(0.057)	(0.043)	(0.051)	(0.043)
Access to Mobile Data	0.170***	0.026	-0.126**	-0.080***	-0.133*
	(0.053)	(0.086)	(0.053)	(0.022)	(0.068)
Internet[2]	-0.089	0.020	-0.185	-0.409***	0.043
	(0.183)	(0.188)	(0.154)	(0.121)	(0.075)
Access to Quiet Place	0.013	0.037	0.033	-0.004	0.020
	(0.054)	(0.071)	(0.036)	(0.070)	(0.040)
Access to a Desk	0.210***	0.100***	-0.027	0.023	-0.071
	(0.024)	(0.036)	(0.042)	(0.046)	(0.054)
Access to Mic and Headphones	0.214*	0.111	0.126*	0.112**	0.060
	(0.120)	(0.110)	(0.066)	(0.051)	(0.056)
Access to Study Material	0.072	0.043	-0.055	-0.035	-0.041**
	(0.098)	(0.042)	(0.050)	(0.040)	(0.019)
Mobility and Socializing					
Going Out For:					
Grocery	-0.124***	-0.015	0.096***	0.113***	0.064***
	(0.046)	(0.051)	(0.032)	(0.025)	(0.020)
Walk	0.053	0.005	-0.015	0.104	0.055
	(0.050)	(0.037)	(0.051)	(0.082)	(0.067)
Shopping	0.030	0.027	-0.140***	-0.100	-0.137
	(0.039)	(0.041)	(0.009)	(0.100)	(0.093)

Friends and Family	0.071*	-0.002	0.133	0.074	0.115**
	(0.037)	(0.076)	(0.081)	(0.060)	(0.047)
Observations	254	254	254	254	254

Note: Standard errors are in parenthesis; *,**,*** represent statistical significance at 1%, 5% and 10% respectively.
1: Socio-demographic control variables include age, gender, household income and assets owned by the household.
2: Reference Group: No Wifi Internet Available
3: Average of Likert Scale from 1-5, where 1 is the least satisfied and 5 is the most satisfied.

Table 5: Marginal Effect of the Logistics Regression on Positive and Negative Emotions of Middle-Income University Students During Online Classes.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Joyful	Hopeful	Frustrated	Angry	Anxious
Academic Environment					
Synchronous Lectures	0.227***	0.051	0.027	0.023	-0.025
	(0.070)	(0.038)	(0.047)	(0.041)	(0.072)
Assignments	0.005	-0.067**	0.042***	0.023	0.024
	(0.040)	(0.031)	(0.013)	(0.015)	(0.020)
Larger Workloads	-0.098***	-0.075***	0.165***	0.197***	0.168***
	(0.021)	(0.012)	(0.014)	(0.019)	(0.009)
Teaching Staff[3]	0.038***	0.062***	0.012	0.009*	0.004
	(0.010)	(0.009)	(0.012)	(0.005)	(0.013)
IT Support[3]	0.036***	-0.010	-0.000	-0.017	0.014
	(0.013)	(0.008)	(0.009)	(0.017)	(0.026)
Student Affairs[3]	0.009***	0.032***	-0.019***	0.001	-0.010
	(0.002)	(0.003)	(0.004)	(0.006)	(0.006)
Infrastructural Facilities					
Access to Mobile Data	0.076***	-0.005	-0.064	-0.087**	-0.039*
	(0.011)	(0.018)	(0.058)	(0.035)	(0.022)
Internet[2]	0.019	0.075	0.142***	0.137***	0.113*
	(0.032)	(0.092)	(0.037)	(0.016)	(0.066)
Access to Quiet Place	0.051***	0.052**	-0.001	-0.021	-0.063*
	(0.015)	(0.021)	(0.037)	(0.035)	(0.037)
Access to a Desk	0.016	0.015***	-0.092***	-0.070***	-0.030
	(0.027)	(0.005)	(0.011)	(0.015)	(0.029)
Access to Mic and Headphones	0.017	0.072***	-0.102***	-0.118***	-0.002
	(0.055)	(0.020)	(0.033)	(0.040)	(0.027)

Access to Study Material	0.009	-0.033	0.022	-0.003	-0.042
	(0.018)	(0.030)	(0.033)	(0.023)	(0.032)
Mobility and Socializing					
Going Out For:					
Grocery	0.002	0.117***	0.115***	0.082*	0.106***
	(0.009)	(0.025)	(0.028)	(0.044)	(0.028)
Walk	0.107*	0.012	0.083***	0.085***	0.113***
	(0.057)	(0.023)	(0.012)	(0.029)	(0.043)
Shopping	-0.022	-0.030	-0.021	-0.030*	-0.030
	(0.062)	(0.025)	(0.015)	(0.018)	(0.033)
Friends and Family	0.101***	0.062***	0.049***	0.088***	0.022
	(0.011)	(0.011)	(0.009)	(0.027)	(0.029)
Observations	619	619	619	619	619

Note: Standard errors are in parenthesis; *,**,*** represent statistical significance at 1%, 5% and 10% respectively.
1: Socio-demographic control variables include age, gender, household income and assets owned by the household.
2: Reference Group: No Wifi Internet Available
3: Average of Likert Scale from 1-5 where 1 is least satisfied and 5 is most satisfied.

Table 6: Marginal Effect of the Logistics Regression on Positive and Negative Emotions of Lower -Income University Students During Online Classes.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Joyful	Hopeful	Frustrated	Angry	Anxious
Academic Environment					
Synchronous Lectures	0.031	0.092	0.003	-0.085	0.003
	(0.068)	(0.099)	(0.077)	(0.055)	(0.027)
Assignments	-0.022	-0.005	-0.026	0.019	-0.030
	(0.036)	(0.032)	(0.027)	(0.060)	(0.034)
Larger Workloads	-0.070	-0.001	0.101**	0.106	0.034
	(0.057)	(0.064)	(0.051)	(0.065)	(0.036)
Teaching Staff[3]	0.032**	0.068***	0.025	-0.002	0.022
	(0.016)	(0.018)	(0.024)	(0.028)	(0.021)
IT Support[3]	0.014	0.014	-0.009	-0.023	-0.018
	(0.037)	(0.019)	(0.014)	(0.027)	(0.011)
Student Affairs[3]	0.012	-0.016	-0.004	-0.018	-0.006
	(0.013)	(0.018)	(0.015)	(0.019)	(0.022)
Infrastructural Facilities					
Access to Mobile Data	-0.008	0.000	-0.053**	-0.093	0.003
	(0.024)	(0.050)	(0.027)	(0.075)	(0.055)
Internet[2]	0.074	-0.003	0.014	-0.072*	-0.030
	(0.046)	(0.062)	(0.018)	(0.038)	(0.043)

Class Accompanied	0.002	0.002	0.039	0.178***	0.053
	(0.033)	(0.023)	(0.047)	(0.012)	(0.058)
Access to Quiet Place	-0.018	0.004	-0.021	-0.017	0.051***
	(0.083)	(0.044)	(0.045)	(0.034)	(0.010)
Access to a Desk	0.027	0.060	-0.066	-0.105*	-0.043
	(0.046)	(0.074)	(0.059)	(0.062)	(0.052)
Access to Mic and Headphones	0.097*	0.048	-0.032	0.039	0.087
	(0.056)	(0.034)	(0.079)	(0.090)	(0.030)
Access to Study Material	0.094***	0.063*	0.015	0.069	-0.056
	(0.032)	(0.035)	(0.058)	(0.038)	(0.065)
Mobility and Socializing					
Going Out For:					
Grocery	-0.042	0.061	0.052	-0.058*	0.018
	(0.028)	(0.089)	(0.062)	(0.034)	(0.065)
Walk	-0.040	0.034	-0.062	-0.082	0.023
	(0.076)	(0.037)	(0.055)	(0.065)	(0.043)
Shopping	0.001	-0.110	-0.001	0.132	-0.001
	(0.082)	(0.073)	(0.040)	(0.089)	(0.079)
Friends and Family	0.031	0.052***	0.033	0.046	0.030
	(0.043)	(0.018)	(0.032)	(0.072)	(0.066)
Observations	522	522	522	518	522

Note: Standard errors are in parenthesis; *,**,*** represent statistical significance at 1%, 5% and 10% respectively.

1: Socio-demographic control variables include age, gender, household income and assets owned by the household.

2: Reference Group: No Wifi Internet Available

3: Average of Likert Scale from 1-5 where 1 is least satisfied and 5 is most satisfied.