Note: Learn Online: High School Students' Adoption of Online Learning in Bangladesh during COVID-19 Pandemic

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ABSTRACT

Online learning is playing a significant role, especially during the COVID-19 pandemic. In this study, we perform an interview study through in-depth interviews with 22 high school students of a developing country (Bangladesh) to find out about their experience and practices with online learning during the pandemic. Our findings reveal several usage strategies, challenges of the conventional usage of online learning, workarounds students adopt to address those challenges. Through the adaptability lens, we find that many students are adapting to online learning despite being in favor of it.

CCS CONCEPTS

• **Human-centered computing → Empirical studies in HCI**.

KEYWORDS

Online learning, Pandemic, User study, Online platform, Adaptability

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1 INTRODUCTION

The impact of the COVID-19 pandemic has caused disruption to the education system worldwide. The pandemic policies taken by many countries including Bangladesh forced educational institutions to dismiss their activities to prevent the spread of this virus. Whilst online learning has been a research focus in the field of HCI [2], the compelled situation of the pandemic context introduces significant differences in the assumptions of online learning. Even after the pandemic, the current mass adoption of online learning could have lasting impacts on the education system [17]. Thus, understanding students' learning experiences during the pandemic becomes imperative. Emerging evidence on students' online learning experience during the pandemic has identified several major concerns pertinent to availability of IT equipment, internet connection, limited collaborative learning opportunities, etc. [4, 8]. However, most of these studies were limited to higher education, except for some studies [4, 26] on high school students. Empirical research which targets the full spectrum of high school students remains scarce. Therefore, to address these gaps, this study focuses on high school students and their learning experiences. Additionally, the adaptability lens [21] shows that the environment has a direct effect on mediating processes of individuals. Individuals are likely to acquire the appropriate knowledge about a situation, identify the relevant situational cues highlighting a need for change, select a set of relevant strategies, adopt active coping styles, and implement problem-focused coping strategies for the situation. Building upon this adaptability lens [21], we framed our research to understand students' experiences with online learning in Bangladesh during the pandemic time. We explore the following research questions in our study.

- **RQ1:** What are the purposes, values, and usage strategies of online learning by the high school students of Bangladesh during an emergency situation? How do they adapt to such a situation?
- **RQ2:** What are the challenges those students face in their online learning practices? What are the workarounds they follow to reduce those challenges?

In this study, we present an account of high school students' experiences and practices of online learning during the pandemic. We find out how students adapt to emergency online learning, their priorities, challenges, and their day-to-day actions to address these challenges and their expectations. These will help HCI to better understand these problems. Moreover, from the aforementioned account of the students, we extract insights to inform HCI research.

2 RELATED WORK

There has been a growing need for online learning because of its increasing acceptance [22]. However, the advantages of online learning are not always fulfilled due to certain challenges. Digital readiness is the availability of information technologies and infrastructures. Researchers [9] expressed their concern about the divide in digital readiness between different countries that could influence students' learning experience. Students from low digital-readiness countries could experience additional technology-related problems. Supporting evidence is emerging in recent studies conducted during the COVID-19 pandemic [8, 26]. Researchers [7] argue that students need to have a high level of digital literacy to find and use relevant information through technological devices.

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Lacking this ability can make students experience difficulties in online learning. These findings are concerning as younger students in primary and lower secondary school could be more vulnerable to these technical problems as they are less experienced with the technologies in online learning [6]. Therefore, it is essential to investigate the online learning conditions and the related difficulties of students at the high school level as the extent of their challenges remains underexplored. Additionally, online education can lead to a sense of isolation [16], which can be a hindrance to student success. Therefore, integration of social interaction into online learning is essential, especially at the times when students have communication skills underdeveloped [13]. Unfortunately, existing evidence suggested that online learning delivery during the pandemic often lacks interactivity [4, 26]. In most cases, children have to face learning obstacles by themselves [5]. Additionally, school-level students may lack the meta-cognitive skills to use various online learning functions, execute self-regulated learning plans, and maintain engagement in meaningful peer interactions [5]. Thus, understanding these younger students' expectations becomes imperative. A study [18] with students in a Finish high school has found that students often reported fatigue and heavy workload during online learning which would have negative consequences on their academic performance and emotional well-being [18, 26]. However, most of these research studies focused on challenges with online learning. Therefore, it is imperative to investigate how these challenges are addressed by the younger students.

Though online learning platforms are useful, but not an easy way to adopt in Bangladesh [11, 14]. However, Bangladeshi students have the willingness to learn online [12]. The availability of smartphones has contributed to this eagerness to learn online [2]. As a result, students' preparedness, participation, and classroom activities regarding online classes during the pandemic situation were studied in Bangladesh [1, 12]. The results show that students of Bangladesh have an average level of preparedness for online classes as there are certain limitations related to attendance and activities in the classroom. Problems of infeasible consistency of the internet and electricity and lack of opportunities to understand lessons through the online platform are found to be the main constraints of online learning [1, 12]. However, all of these studies [1, 15] focused on university-level students and limited studies have been done focusing on the experiences of secondary level students [1]. Therefore, in this study, we provide a descriptive account of the online learning experiences of high school students during the pandemic in Bangladesh.

3 METHODOLOGY

We conducted semi-structured interviews with 22 high school students to understand students' experiences with online learning during the pandemic. From the context of adaptability lens [21], individuals adopt problem-focused coping strategies for an emergency situation to improve their performance. Building upon this lens, we take a holistic look at the emergency online learning context. The research study and data collection which were carried out in Bangladesh were approved by the Ethics Committee, a part of the Integrity Strategy and Innovation of the authors' institution. Besides, to guarantee the ethical conduction of our research work, after informing about the research study we sought verbal and written consent from the guardians of the interviewees and also from the interviewees before conducting the interviews. We ensured the confidentiality and anonymity of the participants. We recruited interviewees through authors' connections and social media. Pupils of Bangladesh can choose from the specializations offered within the secondary and higher secondary education curriculum are humanities group, commerce group, and science group [19]). The target participants of our study were high school students belonging to the science group. We maintained diversity in the class standings (9,10,11,12), and gender during recruitment. Out of 22 participants, 12 participants reported being male and 10 participants reported being female and aged between 15 to 19 years. Students are presented throughout the paper with codes (P#) to protect their identities. All the interviewees belong to middle-class families (monthly income ranges between $700-$1500) in Bangladesh. Interviews were conducted over phone calls or Zoom meetings lasting between 30 minutes and 90 minutes. There are 32 questions in the questionnaire. Some of the questions asked in the interviews are: *Do you take online assistance for learning?, Did you take online assistance for learning before the pandemic? If yes, why did you take assistance?, Why do you take online assistance for learning purposes?, Do you communicate with your peers through the process? How do you communicate?, Which online platforms do you use for learning purposes?, Why do you prefer those platforms?, How did you know about those platforms?, What are the challenges you face while using those platforms?, What kind of online learning resources do you like?, Do you use Bangladeshi online learning platforms?, Do you use Bangladeshi online learning resources?, What are the challenges you face while online learning?, What do you do to overcome those challenges?, What are your expectations from online learning?.*

All the interviews were conducted in the local language, i.e., Bengali and audio recorded. The audio data was then transcribed, anonymized, and translated into English by our research team prior to our analysis. We used a qualitative approach. We maintained an open and flexible approach with continued analysis [24]. Two researchers coded the interviews, followed by discussion and clarification of codes [20]. Subsequently, emerging categories were continually assessed and clarified alongside new data. For example, we coded instances of challenges across different contexts, such as technological constraints, personal problems, social constraints, etc. enabling workarounds needs to emerge. Eventually, we discovered five themes (Table 1) that are the subsections of the research findings.

4 RESEARCH FINDINGS

We outlined our findings with our discovered themes (Table 1) from the interviews. Online platforms that the participants use in the aggregate are Google, YouTube, Zoom, WhatsApp, Skype, Facebook, etc.

4.1 Purpose and Value of Online Learning

Online learning creates value for students' needs by impacting the cost or convenience of students' daily life. Students mentioned several values of online learning including: (1) increasing convenience,

e.g. travel flexibility, availability of resources, flexible communication among peers, (2) radical cost reduction (incl. time cost), e.g. in getting resources, travel cost, tuition cost, and (3) increasing effectiveness, e.g. in providing better communication and operation, connecting with new people. The students who did not use take online assistance for learning in the pre-pandemic time seem to realize the values of online learning as they are keeping up with the emergency situation, as P21 comments: *"I was happy with only face-to-face learning. So I used to avoid using these online platforms. Now, it became imperative to use these online platforms to attend online classes and get learning materials. It saves me a lot of time, effort, and cost."*

4.2 Usage Strategies of Online Learning

A large proportion of students' efforts and time are spent deciding on which platforms they need to use. This is interesting, as most HCI research addresses tactical usage [3, 23] rather than decision strategy. Students who are previously experienced with online learning are familiar with online platforms. They utilize their experience while choosing a new online platform. Moreover, there is diversity in students' online learning, depending on preferred learning styles, and their needs. For continuous learning and development, many students habitually consult various online platforms as well as take suggestions from peers and instructors. They find out about a specific platform, try to align them with their requirements and expectations, and then decide if they should use the platform or not. The engagement with peers about deciding on a platform often can happen as a secondary engagement. If peers are discussing a topic and one of them comes up with an online platform they use for learning, another one may try to use it to see if it helps him too.

4.3 Challenges Faced during Online Learning

Students used several online platforms which frequently caused information overload and eventually delay to find suitable learning resources. Many students do not have personal technological devices. They use their parents' or other family members' devices. As a result, they can not get those devices any time they require. Further, parents often restrict them from using those devices after a certain time. This causes additional concern among students since they require devices for online learning. Even if online classes to some extent can be attended without any interruptions, still some students feel a lack of attention from instructors. Additionally, the school work of these students is in fact various, including looking at the screen, taking notes, focusing on books, communicating with instructors, etc. However, students' focus can often be interrupted by family responsibilities and the environment around them. Students are also concerned about their health since their screen time has increased drastically with school work going online. From time to time headache, back pain, etc. were some of their mentioned concerns.

4.4 Workarounds to Reduce the Challenges of Online Learning

Students developed workarounds to address their challenges for an effective learning experience. For instance, when students faced problems with using an online platform on their device, they explored other additional solutions often on their own to address the issue. For example, they would try clicking to explore the platform with patience and see if those work. Often they would ask for help from their peers if they can not solve it on their own. Some also opted to ask for help from their family members, especially siblings. Students were used to coming up with workarounds to just get things done, so much so that they were often unaware that their process involved additional efforts and time. Students were accustomed to trying out approaches until they found useful ones. A minor adjustment might be memorizing system flows, or collecting the class materials later, rather than asking for the instructor to explain again. As high school students, they were attending online classes, reading, and writing assignments, therefore, these small adjustments were magnified by the sheer amount of uncertainty and stress. These small tweaks occurred so often, that students melded them into everyday tasks, sometimes unaware that they made any adjustment at all. P5's plan depended on notifying his parents about the class schedule to get access to technological devices and mobile data. If class schedules were not known early enough, some have to miss online classes. Students develop strategies for dealing with these additional challenges. For example, they strategically prioritized responsibilities and lowered their expectations for online learning, as P11 comments: *"I do not have a permanent Internet connection. Connection loss was very common. So, I cannot attend classes without any disruption. But I am now used to this. If I miss a class, I collect the lectures from my classmates. If that doesn't work, I just have to go without it. I have accepted this uncertainty"*. Beyond smaller and seemingly invisible adjustments, students frequently tackled these issues in multiple ways: trying to fix the problem on their own, and asking peers for help. If all these workarounds fail, they would appeal to their schools/instructors. Thus, these activities comprise a mix of informal strategies, followed by a formal appeal. Even if issues were substantial, they employed formal options less frequently and only for extreme circumstances like online exams.

4.5 Expectation from Online Learning

Students expected technological solutions to reduce their challenges. Moreover, they agree that investing in technological training is worthwhile. Online learning should be available, however, they felt physical learning is needed as well. According to them, the online platforms that they use for learning require some updated features as well. Easy navigation will help them to understand the system flow easily, Q/A system should be integrated as well as a help page for learners. Practice opportunity was a major requirement for the students. Often it took a lot of time to find suitable resources, students expected to find resources in a short time according to their preference.

5 DISCUSSION

In this section, we discuss the trends we discover from our study and answer the research questions.

Table 1: List of themes and associated codes related to the interviews of the participant students (n=22).

Themes	Associated Codes	
Purpose and value	• Gain in-depth concept • Skill-development • Availability of resources • Easier to understand • Numerous types of resources	• High-standard resources • Self-consciousness • Revision opportunity • Saves cost
Usage Strategies	• Depends on need • Familiarity • Easier to use platforms	• Suggestion from peers • Native language resources
Challenges	• Network Problem • Lack of access to device • Lack of tech experience • Information overload • Distraction & confusion	• "Parents do not let us use" • Lack of communication • Delay to find resources • Lack of personal attention • Frustration & stress
Workarounds	• Additional Efforts and time • Asking for help from friends & family	• Figuring out on own • Asking for help from teachers • Just go with the flow
Expectations	• Practice opportunity • Blended environment • Easy navigation	• Easy communication • Q/A system • Standard Presentation

5.1 Imposition of Online Learning and Adaptability

We find that students who adopt online learning for skill development rather than curriculum activities are more positive about their online learning experience. This extends prior work [25], where researchers find highly motivated students are more attracted to online learning due to its flexibility. We observe that online learning is not a choice always, often it is coerced by the situation (e.g. a pandemic) which compels students to adapt to the new learning environment and reduce their encountered issues with coping strategies. Students who are not in favor of online learning eventually start to cope with the new learning environment. These align with the adaptability lens [21] that focuses on individuals' coping strategies in a situation to improve their overall gain. We also find that students take into account their learning style and their requirement to assess an online platform dynamically, which suggests individuals' differences influence their adaptive performance to online learning [10]. These findings also lead to design implications: (1) Consider individuals' differences, existing values and interests of students, skill development opportunities, and the learning style preference of students. (2) Develop opportunities for communication and features to capture learners' attention and focus considering their fluctuating roles at home. (3) Additionally, implement helpful learning features (e.g. practice module, help page) on online platforms. For example, students use multiple platforms for online learning to meet their purposes which introduces additional burdens to remaining familiar with the functionalities of multiple online platforms. Therefore, features that will assist students to find suitable content from different platforms at once should be taken into consideration.

5.2 Challenges, Workarounds, and Online Learning

We find that to perform schoolwork more conveniently, students communicate with their peers and share suggestions about online platforms, and resources among themselves. However, the students were concerned about their schoolwork. Concern about device accessibility (e.g Internet connection, devices, etc.) was the most common among them, and it caused hardships in their learning experience. For solving these, students give additional time and effort to convince their parents or appeal to their schools. However, when none of these workaround methods work they simply skip online classes altogether accepting the fact that it will not be possible to attend the classes for them. Then, they would contact their peers or instructors asking for class lectures, notes, or additional information to at least continue their formal learning. Thus, they discovered workarounds in such cases which involved seeking help from peers, and instructors, or figuring it out on their own. These support

adaptability lens [21] which focuses on the environment having a direct effect on mediating processes of individuals. Students acquire the appropriate knowledge about their situation such as device inaccessibility or lack of technological experience and identify the relevant situational cues highlighting a need for workarounds to reduce the effects of their challenges. These workarounds extend prior work [4, 18, 26] where high school students' online learning experiences during the pandemic have been studied.

6 CONCLUSION

Our study explores the struggles exclusive to the high school students, and our findings prove that they indeed face unique challenges due to resource constraints, and limited previous experience with online learning. In emergency situations like a pandemic, the high-level need (continuing education) becomes more dominant than comfort. As a result, they adopt several ad-hoc workarounds to address these issues which require additional time and effort. Our results are drawn from students' self-reported viewpoints belonging to middle-class families in a single Bangladeshi urban area. Also, most of the interviewees are recruited through snowball sampling. However, the findings of our study will be useful to understand the online learning condition in an emergency situation.

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