

# Facebook's Social Learning Group for Undergraduate Engineering Courses: A Case Study of Emergency Remote Teaching Amid Large Digital Divide

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**Abstract**—The COVID-19 Pandemic has forced many educational institutions worldwide to adopt emergency measures to complete the semester or school-year, which was rolling before the crisis hit. Different formal and informal Course Management Systems (CMSs) were incorporated to aid in this sudden transition to virtual classroom mode. A significant challenge that emerged in the Global South during this emergency transition was the glaring presence of Digital Divide. In this paper, we explore this situation for Bangladesh through a case study of three courses where emergency remote teaching was adopted from March to June 2020. The students enrolled were surveyed using questionnaire and the collected data was analyzed to determine the potency of Facebook Social Learning groups in Emergency Remote Teaching. Even as the emergency remote teaching phase ends in many communities, the pandemic and its effects continue and institutions worldwide are preparing themselves for long-term fully online classroom settings. It is thus essential to wisely choose a platform and pedagogical system for online teaching, which can minimize the discriminating effects of the digital divide among students. With that motivation, we present our work exploring the efficacy of Facebook's Social Learning Group as an inexpensive alternative to high-bandwidth consuming and costly CMSs.

**Keywords**—course management tools, social networks, developing countries, emergency remote teaching, digital divide

## I. INTRODUCTION

Course Management Systems (CMS) (sometimes better known as Learning Management Systems (LMS)) are online tools to aid teaching and learning. They can be used as a supplementary support system for traditional face-to-face classes; or as a more important and complementary component in a blended classroom setup; or even as the stand-alone platform for a fully online classroom setting management or communication systems. The CMS used for the last setup is likely to demand features that may have been optional for the other categories and are required to be ready to handle more unique challenges. We focus on this third scenario and explore whether Facebook can be an apt

platform for such a fully online setup. Such exploration became crucial in the face of the COVID-19 pandemic as institutions worldwide were forced to adopt emergency remote teaching.

The COVID-19 pandemic has stricken almost all countries around the world. With governments implementing lockdown and quarantine measures, regular on-campus classes in schools, colleges, universities, and other educational institutions had come to a halt suddenly for many communities. Closure of educational institutions has affected more than 1.5 billion students worldwide [1]. As communities faced extended periods of lockdowns or social distancing directives, educational institutions had to think fast about alternative measures to complete the semester they were in when the pandemic closed off regular operations. With very little preparation, teachers had to adopt emergency remote learning – and the process, platform, and planning varied widely from country to country, institution to institution, and even teacher to teacher.

In Bangladesh, the first official COVID-19 cases were recorded in early March, and a national quarantine was imposed on March 25, which remained in effect for two months till May 30 through a series of extensions [2]. Although lockdown measures have been relaxed to some extent from June and a limited number of workplaces, industries, and businesses were allowed to operate with strict rules for physical distancing, the government has ordered all educational institutions to withhold their on-campus activities till August 6 [3]. Bangladesh has about fifty public universities and over a hundred private universities – all of which were affected by the directive. The University Grants Commission (UGC), the government body in charge of ensuring quality in higher education for the country [4], permitted online teaching but provided freedom to the universities to make decisions on their own in terms of the extent and nature. At the time of the school closures, universities were at different points of completion of their then-rolling semester. Some universities could cease all

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teaching and learning operations and had enough materials covered for them to opt for an end to the semester by updating the grading scheme. However, most universities had a significant portion of their semesters' curriculum left, and many were compelled to take the sudden massive transition to online teaching and learning at a very short period of notice. This compelled the administrative bodies to explore alternatives. Most universities decided to opt for a primary switch to live online classes using Google Meet or Zoom, and enough flexibility was provided to the faculty members. Our university, one of the top private universities of the country, wasted no time and resumed classes online by the end of March. Although our default suggestion was to go for Google Meet, we, the researchers of this paper, availing the freedom provided by our administration, went for Facebook as our mode of choice.

We chose Facebook as our platform for emergency remote teaching for several reasons. Firstly, we were already using Facebook's Social Learning Groups as supporting 'CMSs' for the courses we were teaching. The students were familiar with the platform, and so were we. It made sense to allow the students some level of familiarity and consistency, with all the uncertainties and new impositions around. Secondly, other countries had already started testing live classes over video conferencing tools, and we were aware of some of the challenges. Students and stakeholders were passionately debating the possible consequences of imposed live classes. We thus chose to go for a model that includes small prerecorded videos, and live interactions are done through a chat messenger rather than bandwidth-hungry video conferences. Thirdly, the average internet speed of Bangladesh is notoriously slow [5], less than 40% of the global average. Although the main cities have tolerable service, by the time quarantine rolled in, most students had gone home, scattered all around the country.

Facebook's Social Learning Groups had already showed some potential as a CMS in our previous work [6]. As the most popular social network in the country, Facebook enjoys the loyalty of 94% of all active social media users of the country [7]. Facebook Zero has made it even easier for it to be used in regions with poor internet connections [8]. However, adapting the existing model of our Facebook as CMS setup for fully online classes in an emergency setting inevitably brought in new challenges and was not trivial.

Motivated by the search for student-friendly learning setups and designs, we decided to systematically use our emergency remote teaching experience for exploring the possibility of using Facebook's Social Learning Groups as comprehensive online pedagogical platforms in the future. We also wanted to be consciously prepared for any digital divide, which we suspected may exist but was not sure of at that point.

Our research question is thus two-fold

- a. *Can Facebook be used effectively towards fully online teaching and learning?*
- b. *Is Facebook's Social Learning Group any better at managing the adverse effects of the Digital Divide among students?*

This paper is a mixed-method exploratory survey-based case study, where we present our findings for the benefit of other institutions, faculty members, and perhaps the administration, in case they want to consider implementing a low-cost alternative to costly CMS. This paper is also part of a larger investigation that seeks to find whether the ubiquitous and free social networking service Facebook's features can be used meaningfully as a CMS for fully online classes in the future. The analysis of efficacy is performed systematically against established features of successful CMSs. Insights from the case study also sheds light on possible best practices that can be adopted for the unprecedented nature of online semesters ahead.

The rest of the paper is organized as follows. Section II sets the premise by providing a glimpse of current literature on pandemic period emergency teaching and policies as well as sets up the context of the digital divide. This is followed by Section III, which explains the methodology we employed to obtain the data for our paper. Section IV describes the model of how Facebook Groups were used as a CMS for emergency teaching and learning in this study. Data from the questionnaire survey are summarized in the Findings section afterward. This is followed by an in-depth discussion that ties in our data with the context established in the literature review. The paper is concluded in Section VII.

## II. LITERATURE REVIEW

We will initiate our literature review by looking into the situation of emergency remote teaching worldwide and various policies adopted to manage teaching and learning in institutions across the globe. This will enable us to situate our case study well in the literature and also provide a more practical understanding of any advantage provided by our adopted platform (Facebook's Social Learning Groups), as well as the constraints and limitations. Facebook has been used to a varied extent in tertiary education academic setting before, but mostly for non-engineering courses (e.g. [9]-[12] and the references within). For a detailed literature review on open-source CMSs and social media networks as CMSs as well as prior academic use of Facebook, please see the literature review of [6]. For this current work, we limit ourselves mostly to the context of pandemic-era measures. We also provide a short review of the concept of the Digital Divide and how it has affected communities in the pandemic.

### A. ERTs and Online Education

As the first academic semester, to be affected by the COVID-19 pandemic, comes to a close in most universities and schools worldwide, through the various extent of emergency remote teaching strategies for two, three or more months, academicians have finally found some time to take a step back and evaluate the unprecedented measures they had been forced to take in order to adapt to the circumstances. Consequently, a plethora of pandemic-related work has been recently published, which gives an intriguing look into the world of emergency remote teaching generated by the COVID-19 pandemic.

Emergency remote learning is different from online education [13][14]. Proper online education is a complex ecology with carefully planned teaching and learning parameters. It is worth looking at the nature of ERT, and the inevitable constraints and limitations faced, so that we are

more prepared for long-term online learning or distance learning.

As the first affected country, China was also one of the firsts to adopt ERT measures. Tsinghua University moved all classes online on schedule and on time by February using their independently designed platform which synchronizes well with WeChat, the popular messaging app. Peking University livestreamed their classes as well as opened up online group chats for discussion. The Chinese Government strengthened a couple of their existing platforms on online education by introducing class scheduling features. The platforms provided thousands of classes and teaching resources and best practices all over the country [15][16][17].

In India, their UGC opened up various online resources and database and permitted online classes even before the country moved to lockdown. Universities have offered online classes through Piazza, Zoom, Skype, Easyclass and more. Some utilized readymade lessons from NPTEL and recorded classes from YouTube [18][19]. Researchers in [19] showed a strong use of social media for educational purposes in the COVID-19 time in India, but acknowledged that they are mostly being used in a formal or systematic way. SWAYAM provided access to 1900 courses that could be taken for credit towards existing university curriculum and SWAYAM Prabha used TV to broadcast lectures [18].

Rapid migration to online teaching was also undertaken in other countries in the Global South such as Indonesia [20], Philippines [21], Zimbabwe [22], Nigeria [23] to mention a few, using common video conferencing tools, social media or with govt. help.

*Challenges Emerged:* Across the board in all the works discussed above, some themes of common challenges have emerged with respect to ERT. For students, this list is topped by access issues, cost of internet, digital security, student's lack of enthusiasm and mental positivity and time zone problems (China mostly, but intensely enough). For teacher, the top challenges included being overwhelmed with online learning sources and tools available, lack of knowledge about online teaching strategies and prioritization of personal and family needs.

ERT phase has been a learning period as we rush to find a temporary solution. As [19] points out, it is crucial that we do not get hung up here and instead use the lessons learned for creating a proper online learning environment for our educational systems. Eventually we need to go beyond the 'emergency' tag and focus on more general instructional policies suggested by researcher, think-tanks and various institutions, which are more well-thought-out for long-term strategies and cover a range of topics from platforms to major decisions about the shift in operations, grading concepts, resource allocation, teaching and learning innovations, etc. However, delving into such literature is beyond the scope of this paper at the moment.

#### B. Digital Divide and its effect in the pandemic.

The COVID-19 pandemic has affected 90% of the world's enrolled student population from around 165 countries [1]. Considering education as a fundamental human right, every affected student has the right to have an equal opportunity to education as before, when classrooms shift to the virtual world. However, UNESCO has warned of

a startling digital divide [24] and many recent published works have demonstrated the existence of the divide with data [16][18][22]. Researchers in several works [25-27] have also demonstrated that the developed countries are clearly at an advantage with remote learning compared to their developing and underdeveloped counterparts - and this correlates with the presence of a wider digital divide in the second group of nations.

*Definition of Digital Divide for this work:* The term 'digital divide' started as a phrase to denote the imbalance between populations who had and used phone and internet service and those who didn't, i.e., mainly in terms of *access* and later, in terms of *usage* and *impact* [28][29]. Despite its wide implications and definition now, the digital divide could be considered to be simply measured in terms of lack of access to the following five items:

1. Access to and use of internet service
2. Access to and use of the device
3. Access to digital literacy training
4. Access to excellent tech support
5. Meaningful online content and application suited to the user.

For our paper, we will consider *accessibility* inspired by the *access* concepts of only three items (1,2 and 4) of the five items listed above. We assume item 5 and 3 are the same for all participants in the case study (5 as the same course content provided to everyone and 3 because they are all engineering students in the same institution and can be considered to have passed a minimal threshold of digital literacy)

We now state the contribution of this paper in more detailed terminology.

1. We present actionable insights from using Facebook as an ERT tool, which can help in designing the ubiquitous social media for more through usage for fully online classes.
2. Our pedagogical designs and efforts had Digital Divide in mind for the South Asian context. We present our case-study in a student-oriented light so that it is easy for educators to understand the extent of the divide in similar communities.

### III. METHODOLOGY

Our mixed-method case study was performed in three undergraduate engineering courses. The courses started in January 2020 in the traditional way, with a Facebook Learning Group as supporting CMS in each course complementing the offline classes. However, the courses were migrated fully online from the end of March 2020 and ran online for two months before the final exam period started. The semester came to an end in the middle of June through the submission of the grades.

Among the three courses in the case study, there were two sections on Analog Electronics, and one section of fundamental Control Engineering course. A total of 78 students were enrolled in these courses. We designed a questionnaire and sent it online to all the students at the end of the semester after the grades were submitted. The link to the survey was shared through the course Facebook Groups. 47 out of the 78 students participated in the survey. The



students were informed of the purpose of the survey, and they participated voluntarily.

The questionnaire consisted of five sections of closed-ended and open-ended questions. The first section had two basic questions on demographics. The second section had eleven questions on internet and device usages. The third section consisted of five questions that gauged students' perception on different features of the Facebook Group. The fourth section had four questions to understand the students' comparative assessment of Facebook with other platforms. The last section called for open-ended feedback. The items in sections 1 and 2 were a short-question type or multiple-choice type. Questions in Section 3 and 4 asked the students to respond to statements on a five-point Likert-scale. The higher point usually corresponded favorably for the system under experimentation.

#### IV. THE MODEL OF FACEBOOK GROUP AS AN ERT TOOL

In this section we present a model of how we strove to use Facebook as an emergency remote teaching tool for our case study. Our model was designed heavily based on the four curated features that a CMS should have [6]. They are Communication, Material Management, Assessment and Progress Tracking. We focus only on the ERT model in this section. For a regular classroom supplement model and the pre-pandemic situation of the Facebook Groups, please see [6].

The top-view model was as follows: for each course, the associated Facebook Social Group had the instructors as admins and the students as members. It is not necessary for anyone in the group to be 'friends' with each other. The Group has a 'Units' feature, where posts can be grouped together under a named unit. For each session (a 1.5 hours class), a new Unit will be created with the date and number of the session. The first post in the Unit would be one asking the student to inform of their presence. The students would comment 'Present' underneath that post. As Facebook comments are time-stamped, this acted as an easy replacement of student card swipes before entering the classroom which was used to record class attendance for each student during the pre-pandemic era. At the start of the session, instructor and students gathered in Facebook Messenger Thread, where the instructor would welcome the student and talk a bit (chitchat, make announcements, etc.). Then the instructor would request the students to go to the Group and watch the first lecture video. These videos were 5 minutes to 10 minutes' worth of topic-based shorts that the instructor had made and posted underneath the current session's Unit. After the allotted video watching time was over (which was sufficiently longer than the actual length of the video to be flexible enough for internet issues), students met at the Messenger Thread again and asked questions to the instructor, discussed points, and do classwork. Afterwards, the instructor would request to go watch the second video and the entire process would be repeated.

*Communication:* There were several mediums in this model, which facilitated student to student communication as well as student to instructor communication. Instructors could post all announcements in the Group and students could clarify any issue in comments right away. Students could initiate posts which they often did regarding a query about their studies. They were quickly helped by their peers or by

the instructors through comments during such cases. The Messenger Thread was a very handy tool for free-flow communication during class-time (without spamming the Group wall). Student would do class-works on their notebooks, take a quick photo, post in the Thread and get a quick feedback from the instructor. They asked and answered questions by typing and sometimes through small audio clips which the Messenger Thread facilitates at the press of a button. Students would also react to each other's' messages and comments, which created quite a festive atmosphere.

*Material Management:* The Units tab was mostly used for organization of material. Besides session-wise units with lecture videos, attendance info, supplementary links of curated videos and articles, all neatly filed under a discrete units for each session, - there were separate units for Course Info (syllabus, course outcomes, handouts etc.), Assignments and Exams. Alternatively, the search feature of the group also made it easy to directly find any file, video or even a particular comment or discussion. Any post could be tagged properly for easy archiving and search, or be filed under an appropriate unit. Student engagement and participation becomes very important in online learning.

*Assessment:* During the ERT period, one of the assignments called for a video submission by the students where they were asked to explain/make a tutorial of particular technical topics from the syllabus. They posted their submission as a comment underneath the instructor post announcing the assignment with detailed instructions, and the comment time-stamp helped instructor keep track of whether the students maintained the deadlines or not. Another category of assessment involved the instructor asking a conceptual question in a post and the students answering them through comments. For final exam, although questions were emailed to students (they were randomized) and students submitted their works by email or a Google form, all common announcements, instructions, student queries and clarification discussion were made through the Group.

*Progress Tracking:* For open-ended submission, the students were given feedback as replies to their comments and they could all learn from the open comments. Although the final distribution of feedback and scores for final exam were done by email to maintain privacy, all generic announcements, clarification and notification, especially about the grading scheme of such an unprecedented semester, were made through the Group, creating trust and transparency.

#### V. FINDINGS

In this section, we present our findings from the questionnaire. We have grouped our findings into four categories:

##### A. Findings on Facebook Usage

Facebook is heavily used by the student population which can be seen from Fig 1. Around 62% of the students use Facebook for 2 hours or more per day. Additionally, the collected data stated that 55% of the students were located in Dhaka City, while 45% were located outside Dhaka City.

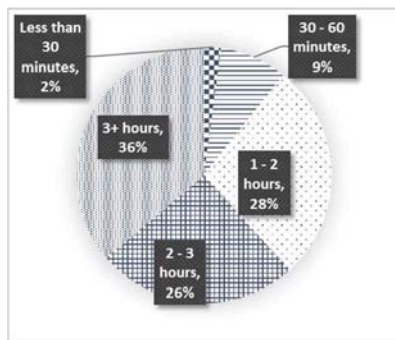


Fig 1. Time spent by students on Facebook per day



Fig 2. Location of students around the country when they were attending the emergency online classes. The dark marker in the center denotes Dhaka, the capital, and the physical location of the university.

### B. Internet and Device Usage

Fig 3 provides the responses to question 1, which looks to uncover the medium of access to the online classes. A majority of the students seemed to rely on Wi-Fi connection for accessing the online classes while some of them prefer a mixture of both Wi-Fi and Data. Question 2 extends from this information and attempts to reveal the average speeds experienced by the Wi-Fi users. 64% of the students were able to experience speeds exceeding 1 Mbps for their connection, some of them even exceeding 20 Mbps, while only 20% of the students experienced speeds less than 1 Mbps. This shows that students availing Wi-Fi connection had very little trouble accessing online classes, given that there were no unforeseen disturbances such as power outage.

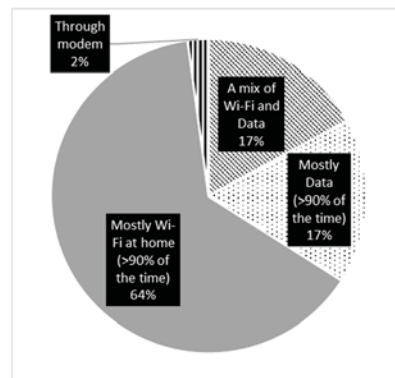


Fig 3. How did the students access the online classes?

Similarly, question 3 looks to understand the variation in expenses per week for the Data users. The responses indicate that around half of the data users spent around 0-100 BDT every week for their internet connection while the remaining half spent more than 100 BDT. Questions 4 and 5 highlight the use of various social packs offered by different service providers. It is found that most of the students do not use such social packages for their internet usage. However, among the people who do avail such services, more than half of them do not use the packs to participate in the course-related activities of Facebook groups. This could be due to the speed limitations of such social packages.

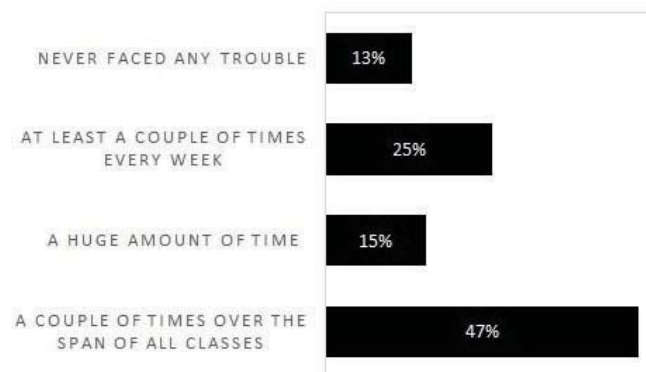


Fig 4. Students suffering from internet trouble during online classes.

Fig 4 shows the responses of the students in question 6, which explores the internet related suffering of the students. The graph shows that majority of the students suffered from internet troubles at least a couple of times during their whole experience of the online classes. Some of them even had to face problems every week. Responses to question 7 provides more insight into these internet problems. Around 50% of the students faced problem of disconnection from the internet due to power outage and running out of mobile data. 10% of the students suffered from internet lag, but on the other hand, 20% of the students did not face any problem regarding the internet connection.

Question 8 explores the device types used by the students. More than 50% of the students used personal computers or laptops to attend the online classes, which is quite understandable because it gives them greater flexibility in terms of screen size when the instructor is explaining course content on a video lecture. The remaining students used their phones to do online classes. Question 9 emphasizes on any device-related problems that the students might have faced.

The responses indicate that around 60% of the students did not face any problem with their devices. Among the ones who did face some issues, most of them were battery and charger related problems.

Question 10 explores access to various technical support for internet problems. In this case, 17% of the students did not face any issue, while 23% of the students bought data packs to avoid any inconvenience. 15% of the students did not have any access to technical support, while another 23% of the students did get technical support from a technician or family members. 9% of the students who did not receive any help relied on self-support. Question 11 investigates access to support regarding device-related problems. For this scenario, around 30% of the students faced no issues, and another 19% of the students solved the problems themselves. 25% of the students were able to find help from IT centers, and their friends and family members helped some of them.

### C. Perception of the effectiveness of the various features of the Facebook Social Learning Group

This sectional of the questionnaire aimed to gauge the perception of the students regarding Facebook Social Learning group features in online class conditions. The data gathered is summarized in Table I.

TABLE I. FREQUENCY DISTRIBUTION OF STUDENT'S PERCEPTION OF FACEBOOK GROUPS

Item	Response Counts					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
	1	2	3	4	5		
1. Communicating regarding course through the Facebook Group was easy.	2	3	11	9	22	4.0	1.16
2. Maintaining units to organize the course materials in Facebook Group has been useful.	3	1	4	10	29	4.3	1.13
3. It is easy to locate materials in the Facebook Group whenever needed.	4	1	3	12	27	4.2	1.20
4. I am fine with the open feedback given in posts and chats.	2	1	8	7	29	4.3	1.09
5. I enjoyed reacting to and getting reacts to peers and instructors posts, comments and messages.	3	0	5	11	27	4.2	1.09
<i>M: Mean</i> <i>SD: Standard Deviation</i> <i>n = 47</i>							

For each item in Table I, the ratio of the students in Agree and Strongly Agree category to the total number of students has been calculated. Using this ratio, it is found that around 66% of the students found that it is easier to communicate regarding the course through Facebook. About 83% of the students found the organization of the course using Units has been helpful. The same percentage found that course materials can be readily accessed in Facebook Groups. Moreover, about 77% of the students found open feedback was useful. 81% of the students also enjoyed interacting with reacts in posts, comments, etc. Overall, in the 5 questions of

Table I, about 78% responded with Agree and Strongly Agree.

### D. Perception of Facebook Groups compared to other platforms

This section illustrates the affirmation and potentiality of Facebook as a medium for educational purposes among the students. The questionnaire here was organized to determine the significance of Facebook as a platform for better communication, more cost-effectiveness, more interactive, and more convenient. The collected data of this section is represented in Table II.

TABLE II. FREQUENCY DISTRIBUTION OF STUDENT'S PERCEPTION ON FACEBOOK AND OTHER PLATFORMS

Item	Response Counts					M	SD
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
	1	2	3	4	5		
1. It was easier to communicate with instructors and/or peers using Facebook compared to other platforms.	3	2	3	9	30	4.3	1.17
2. Overall, it was less expensive for me to do my classes on Facebook, compared to doing them on other platforms.	4	1	7	9	26	4.1	1.24
3. I participated more in the interactive chat sessions of this course compared to the live interactive sessions of other courses.	3	0	8	13	23	4.1	1.10
4. It was easier for me to watch the lecture videos on Facebook than on other platforms.	4	3	4	6	30	4.2	1.31
<i>M: Mean</i> <i>SD: Standard Deviation</i> <i>n = 47</i>							

A notable portion of the participants, 63.8% of the participants strongly agree that Facebook is a trouble-free platform as a communication media for educational purposes. Also, more than half of the participants, 55.3% strongly agreed that they found Facebook was less expensive than other educational tools online while completing this semester. Apart from that, A significant, 48.9% of the participants strongly agreed with the fact that they participated more on the co-operative chat sessions of this course than other course activities in this semester. Hence, a significant portion of the participants, 63.8% strongly agreed that for them scrolling through lecture videos on Facebook seemed more convenient.

We also collected general feedback from all the students, and most of them provided positive feedback.

The open-ended questions provided intriguing insights into the minds of our students. A large number of students preferred the small-size video formats posted in the Facebook group. Ease of access was cited as an advantage.

*"I think, A topic-wise recorded video has more advantages over real-time or conference videos. I mean, we can watch*



later on our convenience, and we don't need to dig into many recorded 1.5 hours long Google Meet videos.”

*“The best online class experience I had from last semester is the class of.... This method of teaching was honestly the best and most effective from the others. That helped me a lot to learn faster.”*

Over 80% of open-ended feedback suggested positive perception of the use of Facebook for the ERT period. Here are some representative samples:

*“I genuinely enjoyed the Facebook class sessions. It eased up the online classes.”*

*“Online class through Facebook is good. Because I can revise previous classes. Also, it's easy to connect with teacher. Messenger meeting was good but a little bit faster. Moreover, I think Facebook class is easier to understand topic than others online platform.”*

*“I loved the messenger group discussion!”*

*“Facebook messenger was the best way to do it. Google meet class teachers had us muted anyway and didn't check the comment section either.”*

*“The platform was new for me but I enjoyed it and learned well. It was easier for me to communicate my instructor and my course mate through this platform.”*

*“The classes were awesome”*

*“The messenger and Facebook combination were an easy going for me. and also, it felt more lively there compare to other online classes.”*

However, a couple of students still missed the live lecture experience.

*“obviously online classes are not made for bd (Bangladesh) with the net connection and device we have in bd real time video class aren't meant for bd but yes study material using prerecorded video was a bit more effective but still not fully I personally feel classes are best in class with board and real time interaction”*

*“I think there should be an online session in every 2 weeks where students can talk to you about their questions related to the last 2 week's classes because you know it's easier to ask the question using voice rather than writing it.”*

Finally, one student had quite a negative view of the entire philosophy.

*“I think live classes would have been appreciated because there had been questions which were needed to asked right on that time. Which can't be done by uploading a lecture video. Some question needed visual explanation rather than verbal. So I would suggest class should be taken live by setting up infrastructure like you are given a typical lecture writing in whiteboard or give explanation assuming you are in physical classroom “.*

## VI. DISCUSSION

In this section, we discuss at length the implications of the findings presented in the previous section. Although we must be careful about not making strong propositional generalizations from a case study like ours, Stake [30] has

argued that it is acceptable to make naturalistic or experiential generalization, specially in applied fields such as Education, from a case study. We thus discuss implications of our study keeping the above boundary in mind.

As most students were scattered all over the country while attending the online classes, their device and internet experience provides a good microcosm of experiences undergraduate engineering student population of the country.

In terms of Facebook as a platform, the students generally appreciated the advantages provided by the Facebook Social Learning Group, and its contribution to easing their emergency online class experience. As a tool for online classes, Facebook Groups' capability of material management, communication and assessment and feedback sharing – all were considered in a strong positive light among the students. They seem to enjoy the prerecorded video format but still prefer live interaction from time to time. We may need to look into video conferencing technology for periodic uses for giving the students a sense of community. Currently, Facebook Messengers can only accommodate group calls for a limited number of people.

Analyzing the open-ended questions in conjunction with the students' internet and device access status, it was seen that the few students who preferred live classes had good digital access and had the financial capability to buy mobile data for the entire class session whenever needed. This only reaffirms the existence of some disparity among the students, as those who faced access issues, appreciated the Facebook setup. Although there was no glaring divide regarding internet access for the group of urban engineering students surveyed, significant difference in the use of device and the lack of a backup or proper device for large number of students was evident. However, the digital divide in terms of access to support was trivial, which is possibly because the participants were undergraduate computer an electrical engineering student and have a good support network or are self-sufficient regarding tech-support.

Answering our research questions, firstly – Facebook seems to be an excellent platform for online classes, although some features still need to be included in it to make it fully self-sufficient such as large-scale video conferencing with screen sharing if needed, as well as smarter ways to manage assessments and progress tracking. And secondly, although not pronounced, there is a subtle digital divide prevailing among the range of undergraduate engineering students of this case study and use of Facebook was highly appreciated by most students, including those who seem to be at the somewhat disadvantaged side of the divide.

## VII. CONCLUSION AND FUTURE DIRECTIONS

In this paper, we present a survey-based exploratory work situated within a context of a paradigm shift, when the world is forced to adopt a virtual reality culture without sufficient preparation. As our understanding and perspective of 'normal' changes, we are bound to seek out innovations and fully new measures to adapt to this new reality. It is of utmost importance to give adequate thought and effort in designing online learning systems for the near-future based on our very recent experiences. We thus do our part in analyzing our actions of emergency remote teaching thoroughly and present

the insights on what worked and what didn't, with a strong focus from the learner's perspective.

The limitation of this study includes the exclusion of socio-economic factors. Much of the students' perception is influenced by their mental condition amid the ambiguity and stress induced by COVID 19. To more thoroughly understand how good Facebook Social Learning Groups can be for fully online classes, we need to implement the experiment in the broader range for the entire semester, start to finish, and also when the severe uncertainty and anxiety is not pervading the lives of everyone who are part of the entire education system in general. That is perhaps a future work. But for the moment, we embrace the advantages given by this low-cost platform such that we can work towards our best to ensure that no student is left behind due to forces of nature beyond our control.

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