Understanding Education Difficulty During COVID-19 Lockdown: Reports on Malaysian University Students' Experience

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ABSTRACT The COVID-19 pandemic has struck the world and forced countries to go into lockdown including education sector. Students have been staying in hostels or houses, unable to go to university campuses. This situation has left university administrators no choice, but to have an online learning channel. Malaysian universities in particular have gone through many challenges to bring their online learning system up and ready to resume education process. However, students have found themselves caught in this situation (pure online learning) with no plan or readiness. Literature reviews showed that students encountered some challenges that could not be easily resolved. This study explored the challenges encountered by students of a government-linked university. This university is one of the largest in Malaysia with over 10 campuses across the country. This study collected 284 valid answers. The findings show that respondents lacked full readiness in this situation physically, environmentally, and psychologically with some differences in perspectives according to their gender, age, and residing state. Respondents were concerned about the implications of lockdown on their performance. The findings of this study indicate that a sudden switch to a pure online alternative creates considerable challenges to students who have no plans to be physically apart from classes. The findings also indicate that the current blended learning process which uses online learning as a support mechanism for face-to-face learning has faced a considerable challenge to replace it, particularly with unprepared students.

INDEX TERMS COVID-19 epidemic, country lockdown, online learning, Malaysia.

I. INTRODUCTION

Globally, universities have been closed to limit the novel coronavirus disease (COVID-19) transmission [1]–[11], thus interrupting the learning process for 1.58 billion learners or 91.4% of total enrolled learners [12], [13]. In Malaysia, the movement control order (MCO) was imposed starting 18th March, 2020 to stop COVID-19 transmission [14]–[17]. Although the government had eased MCO by allowing most businesses to reopen starting 4th May, 2020, the higher education sector remains closed, which is already facing challenges before MCO [15], [18]–[22]. Consequently, Malaysian universities that mainly rely on tuition fees as a source of income may encounter a financially tough time [1], [18] which is felt globally [23] due to the difficult financial situation of

students' sponsors [14], [15]. The situation is more challenging for government-linked universities such as UniKL, Malaysia where most students come from low-income families [24], [25]. Most government-linked organizations are mainly established to introduce chances for students from rural areas to pursue higher education [25]. This study explored the challenges due to the lockdown encountered by students of a government-linked university. The university is known to host a considerable number of students who come from low-income families and receive sponsorships/loans from governmental organizations. This investigation serves to discover various issues encountered by students that need to be resolved by decision makers and avoided in future similar situations [8], [26].

Studies found and reported in the literature section of this study minimally examined the COVID-19 lockdown impact on students' psychological readiness. Students' emotions

play an indispensable role in education [27]–[36]. Educationists have articulated interest in students' emotions due to their impact on students' performance [29]–[31], [37], stress-handling ability [30], problem-solving capability, and capacity to find creative solutions [38]–[40]. Thus, the impact of lockdown on students' psychological status is expected as this online transformation may not be their favorite choice.

On the other hand, students who study via 'distance learning' have prepared themselves for all possible challenges such as learning in a quiet environment where disturbances are under control, settling the hardware and software requirements for learning and communication, and finally preparing themselves psychologically to study from home. However, this does not bear a resemblance to the current situation of switching to pure e-learning. Students have not chosen this type of learning. Challenges encountered by students are also expected due to the unplanned move to pure e-learning approach. Moreover, investigating students' perspective towards pure online learning that has changed the process of education during crisis seems to be featured in the next few months [8].

The following section discusses the literature review and context of this study. The Research Methodology section discusses the research method, sample, and questionnaire. The Results section reports the results related to demography and differences among respondents. Meanwhile, the Discussion section relates the findings of this study with results reported from previous studies. Finally, this paper concludes the findings, contributions, and recommendations.

II. LITERATURE REVIEW

Due to campus closures, academic institutions turn to their online systems to continue the education process [13], [16], [17], [41] which may not be sufficiently ready to handle the entire process [42]. It is also difficult to guarantee that all students have access to unlimited and stable Internet connection [13], [17], [41], as well as laptops or desktops to enable them to attend online classes easily [15]. Pui Yee [15] reported that in Malaysia, a considerable disparity between urban and rural Internet users has been observed, where urban users represent 70.0% of Internet users. Similarly in Denmark, Jæger and Blaabæk [43] reported unequal access to resources between students who come from high-income and low-income families. This disparity seems to exist globally particularly in developing countries [9], [13], [44], [45]. Moreover, Internet speed and coverage differ based on students' budget and location. Some students who reside in rural areas are expected to face challenges in securing sufficient and good Internet access [17], [41], [45], compared to their peers who live in urban areas [15]. These students may receive unfair treatment if classes and assessments are fully conducted online [15]. Therefore, less-privileged students may suffer more [15]. They face many challenges such as lack of resources (computer, Internet access) and a quiet space

to study [44]–[46] apart from being distracted by family responsibilities [15], [46] Pui Yee [15], Lim [17] highlighted that higher education in most Malaysian universities is blended, yet, heavily uses face-to-face teaching process. This is common globally [1] and students feel comfortable with it [47]. This face-to-face process has been considerably disrupted. With the replacement of online process, however, "the quality of interaction will be compromised; the spontaneity possible in the lecture hall is likely to be lost" [15]. It is significant to know students' perspectives, as their input may unveil a number of emotional and readiness issues in facing this new situation [40], [45], [48]–[51]. Contacting students can possibly assist in detecting their online issues. Students also need to have access to labs and equipment to conduct assignments or experiments, which is almost impossible to be done online [15].

Financially, students may incur more expenses due to the needs to subscribe to better Internet packages and buy laptops, in cases where they mainly rely on university computer labs [15]. Moreover, they may face sponsorship issues due to the possible graduation delay and disruption that may impact their academic performance.

Other technical challenges have been expected to happen [3]. With the disparity in financial resources among students, they do not have access to the environmental and equipment factors required for smooth online learning [44]. The home environment for online learning also matters, which leaves poorer students at a disadvantage [44] Pui Yee [15], Arumugam [41] mentioned that online system performance might be compromised due to heavy load, familiarity issue with the platform, and tools and pedagogical demand of online learning, which are different from the face-to-face process. Digital divide among the regions in Malaysia could also obstruct successful online transformation of education which is the same issue faced by South East Asian countries [44]. Asian universities are primarily slow to adopt online learning [46]. Yet, signs of acceptable preparedness by universities have helped them to move to online version of education process with minor difficulties in the first two weeks of lockdown due to training of staff and students on online platforms such as Zoom and Microsoft Teams [41], [46] Pui Yee [15] concluded that Malaysian universities cannot move completely towards full online education process particularly in conducting examinations [41]. Moreover, there are some arguments regarding conducting online assessments for university students [52]. However, their claims [15], [41], [52] have not been supported by strong evidences where cheating in pure online education process obstructs its transformation. For instance, Chertoff, *et al.* [5], Durfee, *et al.* [50], Gomez, *et al.* [51], Rajhans, *et al.* [53] reported that final online assessments took place in many educational institutions with minor impact from any disturbances including cheating. Meanwhile, Chick, *et al.* [26] who proposed a transformation plan for pure online education, had not reported issues during assessments and examinations. Furthermore, many instances of distance learning may revoke

the idea that cheating threatens the reliability of online education process.

Students might have a different perception when moving towards online learning during lockdown. QS [2] conducted a survey to explore students' education experience during the COVID-19 pandemic lockdown. Fifty-eight percent of the surveyed students showed no interest in receiving lessons online during the COVID-19 pandemic lockdown, while 51% expected more classes will be shifted online. They showed some satisfaction with slides, course summaries, and pre-recorded lectures that replaced face-to-face education process [2]. However, students showed dissatisfaction with home environment as the place to study, apart from timing and interruptions [46].

In summary, this study found gaps on prior studies that investigated the challenges related to full online transformation for education during the COVID-19 lockdown. The gaps can be presented as follows: (1) there is a lack of studies discussing the COVID-19 lockdown impact within Malaysia's context; (2) students' feedback regarding this transformation was moderately discussed in previous studies; (3) nontechnical aspects related to the COVID-19 lockdown received moderate focus; (4) technical aspects discussed in previous studies covered educators' perspective with minimum input from students; (5) Internet penetration rate among states and its impact on students' accessibility to online classes received less concern in prior studies; (6) many studies considerably covered the COVID-19 lockdown impact on medical students with lack of studies covering other majors.

A. THE CONTEXT OF THIS STUDY

Majlis Amanah Rakyat (MARA), or the Council of Trust for the People in Malaysia was established to develop rural areas socially and economically [54]. UniKL is one of the MARA subsidiaries to achieve MARA goals in rural development. The government-linked university (UniKL, Malaysia) [55] was selected in this study due to the majority of students are from rural areas [24], [56] belonging to low-income families with lower Internet penetration. This serves to assess the repercussions of country lockdown on education process particularly on those who are less privileged in terms of computing and Internet access. UniKL had complied with the government's lockdown order, prompting the management to come up with a solution to ensure education process continuity. In order to not lose time in preparing the staff and students for this new emerging situation, the university had advanced the semester break to be the week when the government declared MCO and the week after. During this two-week semester break, an intensive number of meetings, curriculum reviews to fit the new requirements of online teaching where experts deemed necessary [51], [57], and training for staff and students with Microsoft Teams had taken place. However, the first urgent matter was to handle the welfare of students staying in hostels. At first, new rules were imposed to ensure no COVID-19 transmission among students in the hostels, as well as securing food and water for them. However, when

the Malaysian government had kept extending MCO with no indication of an end date, the university management had arranged with authorities and related parties to allow students to go back to their hometowns.

Regarding the challenge of handling online courses, the university management almost followed the same scenario described in [42]. The university management had asked every department to report expected challenges and issues and propose the solutions. Every department investigated students and lecturers in order to determine the best approach to ensure continuity of education process. The lecturers reported that many of their students have limited Internet access (a large number of them have mobile data plan). This could be a dilemma as the proposed approach for online teaching such as uploading recorded lectures and presentation slides, and using forums, instant messaging, and Microsoft Teams to deliver classes require students to have Internet access. The Quality Assurance in UniKL was concerned about students receiving the same quality education and meeting standards of education with minimum impact of lockdown, which is also a global concern [8], [26]. Finally, the university was selected due to the considerable number of challenges to overcome as it has more than 12 campuses distributed all over Malaysia [58].

III. RESEARCH METHODOLOGY

A case study on medical studies' institution reported by Almarzooq, *et al.* [59] was regarding how administration and teaching staff handled education process during COVID-19. This study was guided by challenges raised by Almarzooq, *et al.* [59]. This study also investigated students' perspectives, majorly influenced by the COVID-19 lockdown [9]. Furthermore, this study was guided by the framework of Krishnamurthy [4] that covered the transformation of online education process due to the COVID-19 pandemic. The framework covers many aspects, but this work concerned transformation challenges related to students. The major concerns regarding students were related to financial, infrastructure, and psychological aspects. This study focused on undergraduate students in contrast to Upadhyaya, *et al.* [9] who focused on postgraduate students. Undergraduate students rely more on face-to-face learning compared to postgraduate students. Postgraduates do research and may minimally require face-to-face interaction with their supervisors, in contrast to undergraduates. Thus, the undergraduates are expected to suffer more during lockdown. Moreover, the framework [4] concerned none of the fully public educational institutions where in our case, UniKL is considered as one of them. Questions related to employed technologies to conduct online classes were guided by the work of Hilburg, *et al.* [6], Almarzooq, *et al.* [59], Li, *et al.* [60]. Meanwhile, questions related to suitable environment and mental readiness [9] for home study were guided by the work of Kapasia, *et al.* [45]. Finally, studying the differences among respondents' feedback based on their demographic characteristics was guided by the work of

Trung, *et al.* [61] and differences among regions was guided by Rajhans, *et al.* [53]. In this study, the target was students while Rajhans, *et al.* [53] targeted educators.

The Quality Assurance department in UniKL was visited to investigate their findings regarding UniKL's actions to ensure education process continuity during the MCO. This department is in charge of maintaining UniKL's compliance with orders and laws from the Ministry of Education (MOE). Therefore, they were responsible in monitoring the transformation process into pure online education approach. The questionnaire developed was reviewed by the Quality Assurance department to give comments to be considered. The questions' spectrum falls in the range of technical, academic, and environmental challenges in order to transform education process from traditional and/or blended into pure online. In order to investigate the challenges encountered by students of this university (UniKL), the questionnaire was developed and distributed to students of one campus (IT campus) due to its accessibility. Furthermore, this selected campus (IT campus) is located in Kuala Lumpur and considered representative as the students come from every main region in Malaysia. This campus is also the most populated. The questionnaire has three sections: demographic, current situation, and the COVID-19 lockdown impact, as well as a free-text area to allow respondents to record their thoughts that may have been missed by the questionnaire. In the section 'current situations', the questions are:

- What was your response when the University announced replacing physical classes with online version? [multiple choice answer]
- What are the challenges you encountered in order to study from home (hostel)? [check list answer]
- What kind of challenges you have met while doing your assignment during the COVID-19 lockdown? [long answer text]
- Please list down the challenges you encountered while studying online (while using VLE, Microsoft Teams etc.) [long answer text]
- Which are the more convenient replacement for physical class among online learning platforms used by your university? [multiple choices answer]

The section 'COVID-19 lockdown' involves questions regarding the impact of country lockdown due to COVID-19 on social, financial, psychological, interaction, and performance statuses of students. This study then waited three months after the imposed MCO in order to obtain students' feedback after going through training, facing the challenges, and getting used to the situation. The answers acquired might be more accurate compared to the data collected earlier.

With the collaboration of related academic departments from the targeted campus, the questionnaire link was sent to the students. After 10 days, the data were collected. The number of surveys collected was 555. However, after pre-processing the data, only 284 valid surveys were considered for analysis. It was found that due to Internet connection issues, many responses were duplicated.

As this study primarily engaged exploratory research and some quantitative questions, a mixed approach was adopted. This study was guided by the work of Gomez, *et al.* [51], Rajhans, *et al.* [53] in terms of employing qualitative approach and open-ended questions to investigate students' feedback regarding learning during lockdown. A qualitative approach is suitable to discover and gain in-depth understanding of a specific problem. This study used open-ended questions most of the time to collect answers from students. Open-ended questions are known to "have a great diversity of responses" [62]. Open-ended questioning was selected because Popping [62] reported that answers to open-ended questions are more reliable and suitable compared to those captured by closed-ended ones. Furthermore, the freedom to offer their own opinions may encourage respondents to report new thoughts.

Content analysis methodology was also used. This methodology is the classic method used with text. It has three approaches: conventional, directed, and summative [63]. Due to the nature of this study where there is no specific theory to be followed, the conventional approach was used to analyze the answers. According to the principles of the conventional approach, "coding categories are derived directly from the text data" [63]. The conventional approach has the advantage of collecting the information directly from participants without imposing preconceived categories or theories [63]. Therefore, before categorization, answers are read repeatedly to create a sense of the whole [63]. Then, the answers are categorized, coded, and a pattern is established [64]. The coding was set up to capture the potential challenges from lockdown based on perspectives found in prior studies. In addition, further codes of potential relevance to the topic of lockdown impact were developed in the first round of screening. The aim was to capture the main characteristics because the detailed characteristics were large and may lessen the capability to come up with short and concentrated list as prior studies'.

Based on the codes retrieved, code categories were constructed to combine numerous codes that belonged together. These code categories were (a) technical challenge, (b) communication challenge, (c) time management, (d) accessing resources, (e) psychological readiness, and (f) group collaboration. Table 2 shows the complete list of all categories assessed, along with number of cases and coding examples. For all the codes, we assessed intercoder reliability based on percent agreement. For this purpose, a third author coded 25% of the cases independently based on the coding book. Percent agreement was above 96% for all codes. This paper followed the content analysis approach of Lofland and Lofland [65] and the data were formulated accordingly. Finally, quantitative questions were analyzed using T-test and ANOVA in order to detect differences among the groups. Quantitative procedures can empirically provide evidences regarding differences among groups. Consequently, combining both qualitative and quantitative procedures is more appropriate. The next section describes the results.

TABLE 1. Demographics of respondents (N=284).

Gender: Male:199 (70.1%)		**Age:** 18-22: 79 (27.8%)	
Female: 85 (29.9%)		23-25: 201 (70.8%)	
		26+: 4 (1.4%)	
State:	P. Pinang	103	36.3%
	Kuala Lumpur	26	9.2%
	Selangor	29	10.2%
	Kedah	21	7.4%
	Terengganu	17	6.0%
	Kelantan	16	5.6%
	Johor	14	4.9%
	Negeri Sembilan	10	3.5%
	Perak	21	7.4%
	Pahang	8	2.8%
	Melaka	5	1.8%
	*Others	14	4.9%

*other is referring to states/cities and international
Dept: Computer Engineering: 46 (16.2%)
Computer & Networking: 27 (9.5%)
Network System: 92 (32.4%)
Computer Entrepreneurial Management: 18 (6.3%)
Software Engineering: 30 (10.6%)
Computer System Security: 22 (7.7%)
Multimedia & Animation: 21 (7.4)
Information System: 28 (9.9%)

Stay:	Home	258	90.8%
	Hostel	10	3.5%
	Rent_House	16	5.6%

IV. RESULTS

Table 1 presents the demographic data. Male respondents were the majority, representing 70.1% (199) of the sample, while female students were 29.9% (85). The demand age category was 23–25 years, which represented 70.8% (201). This is the expected age range to be at universities. Regarding the departments, the most represented was Network System with 92 respondents (32.4%), followed by Computer Engineering with 46 (16.2%). In terms of states, respondents from Pulau Pinang represented 36.3%, followed by respondents from Selangor (10.2%). In terms of the online study location during lockdown, the highest percentage (90.8%) of respondents was at their respective houses. This means respondents managed to return home at a certain point of time.

In terms of other questions, the first question was students' reactions to the university's decision to stop face-to-face education and move to online platform due to the government's MCO. In terms of challenges, most respondents reported a combination of challenges. A few of the respondents, 5.6% and 10.9% reported no challenges and minor challenges, respectively. The majority reported many challenges (four individual challenges and six combinations). For example, 34.2% of respondents reported not having computers/laptops (old computers, lack of software), unsuitable environment (noisy houses, no private room, family responsibilities), and not psychologically ready for online classes. The single considerable challenge was 'no strong and stable internet connection', reported by 13.4% of respondents.

Similarly, respondents reported the challenges while doing assignments/quizzes/tests/projects as shown in Table 2.

The pattern extraction showed that the respondents mainly reported 12 possible issues while doing their assignments. Some of those issues considerably bothered large ratio of respondents such as poor Internet connection (25.11%), group miscommunication (13.95%), and unsuitable environment (home) (12.09%). A quarter of respondents mainly faced issues in answering quizzes on time and/or uploading assignment answers due to poor Internet connection. The second main issue was completing group assignments due to many challenges such as difficulty to bring all group members online to coordinate and divide tasks, and difficulty to communicate online due to Internet connection instability for some of the members. Finally, the last considerable issue was unsuitable environment. Some respondents (12.09%) felt they lacked the motivation to do assignments/projects due to the relaxing and comfortable environment at home, lack of knowledge (unable to access resources due to Internet issues, could not receive more explanation due to lack of communication with lecturers), commitment to family, and no private room.

Respondents also reported challenges and issues while using the university's virtual learning environment (VLE) and Microsoft Teams as a means for live online streaming for the classes. Table 3 presents the patterns found among students' feedback. There are five possible categories for the issues reported. The major issue was difficulty to be online during classes due to unstable Internet connection. This issue was reported by 33.66% of the respondents. Many respondents attributed it to limited Internet connection (via their mobile hotspot) as the major reason of not maintaining good online class attendance. The second major issue reported by 23.6% of the respondents was difficulty to achieve tasks with online learning system, difficulty to login, and difficulty to use the new tool (Microsoft Teams). Many respondents reported that due to old laptops (and computers), they failed many times to login, download, and upload assignments, and run Microsoft Teams in a single or concurrent session with other necessary software due to small memory. The third issue was students' frustration with this new environment (11.88%). For instance, they reported not able to focus, "keep getting distracted and unclear subjects", "cannot receive further explanation", "only one-way communication", "miss class meeting", and "no facility to do practical". Minor issues such as unfamiliarity with Microsoft Teams and difficulty to keep up with online class scheduling that was quite similar to physical class were reported by 6.43% and 3.96% of respondents respectively. Finally, only 15.84% of respondents reported no issues.

As seen in Table 3, respondents encountered numerous challenges when moving to pure online learning. Due to those, several solutions were suggested as presented in Table 4. The majority preferred the old way of blended learning process, which is using "Panopto", a tool to record lectures and upload them into VLE, but they would need an extension in terms of submission deadline. This was suggested by one of the respondents and supported by 47.1% of the respondents. Meanwhile, 31.9% of respondents

TABLE 2. What kind of issues you have met while doing your assignment during COVID 19 lockdown?.

Issue	Cases	%	Sample
Clashed dates and time	23	10.69	All the lecturer deadlines are same so we get problem to settle it/ Too much of assignments because all lecturers gave assignments & mostly have the same deadline. I've tried to manage my time but still have to do my assignments until 4/5 am.
Laptop and/or software problem	13	6.04	Software is too heavy for my laptop. I cannot run the software smoothly. Hence, I submitted most of my work late.
Lack of materials	12	5.58	Difficulty to done a lab because I don't have the hardware components to lab.
No issues	27	12.55	
Group Assignment	30	13.95	For group assignment, I am facing problem to have a group discussion... Sometime Internet really poor, they have to finish another assignment, they missed group discussion because wake up late
Internet Connection Problem/limited connection	54	25.11	I don't have fixed line for internet at my home and I need to use mobile data hotspot which is sometimes not stable. It is quite challenging to complete the assignment/late for submitting assignment because of connection slow/My connection has been very poor and unstable, thus doing assignments takes a VERY long time to complete.
Lack of full understanding for assignment/project	10	4.65	Feeling uncomfortable to contact lecturers because I don't know whether it is the suitable time or not to contact via personal message)/ Lecturers upload slides and have to submit lab. I have trouble fully understanding the subject due to lack of resources. And assignment is due in a short period of time.

Issue	Cases	%	Sample
online learning system issues (slow/crash/ unfamiliarity/Lost connection)	5	2.32	My lecturer use both *VLE* and *Teams* to submit assignment. Since this is my first time using *Teams*, I do not know the proper way of submitting the assignment. I thought it would be like *VLE*. After that, my lecturer told most of the students in her class got 0 mark for that assignment because it didn't submit properly. She teaches us how to upload via *Teams* after giving us 0 mark. A little bit unfair for me. I think if for submission of assignment just go through *VLE*. Lecturer don't have to use a new way to submit the assignment.
classes during the weekend and public holidays	1	0.46	
Cannot focus doing assignment/Home/family distraction..	26	12.09	There are lot of assignments and at the same time I need to take care of my sick grandmother/ Too many distractions at home (noise, having to help with house chores all the time/ Sometimes I don't have a motivation and it is difficult to adapt with online classes/No big issue but I have trouble with commitment with family. They don't like I spent too much on laptop or doing work
Have to share laptop	3	1.39	Sharing laptop with siblings because one of them left their laptop at hostel/I can only do my assignment at night because I used to do my assignment at Unikl library during the day because my sister only lends her laptop to me at night. This makes me have a very limited time to do my assignment. and when I stay up late and then need to wake up early. I cannot focus in class or sometimes didn't wake up at all
Lack of communication with lecturers (to consult assignment/FYP)	11	5.11	Boring, no interaction, feels lonely/It's hard to study without proper class/ It's hard to ask some help for study from lecturer/difficult to understand

TABLE 3. Issues while using online system.

Issue	Cases	%	Samples
Difficulties with VLE and Microsoft Teams	47	23.26	My laptop kind of lag especially when I use *Microsoft Teams* and Oracle together/Sometime the there is no internet connection, sometime the line stuck and I cannot here the lecturer's voice/Mostly the internet. Cut out many time while doing quizzes. Blackout also sometimes. /*VLE* is smooth but with *Microsoft Teams*, I can only use the chat. *Microsoft Teams* is too heavy to run on my laptop. So, I cannot join video or audio call. I cannot run *Microsoft Teams* simultaneously with other heavy software. It will crash my laptop.
Internet connection instability	68	33.66	Line coverage is edge, cannot open the pages at all. only works sometimes. data is limited too/My internet is a bit of mess. While in online class, I was left out because of the slow connection of internet. was not able to communicate freely While in online class because the unstable voice due to the poor connection/
Technical issue	10	4.95	Sometime *VLE* cannot login/ microphone does not work and recording session failed/sound mic problem
No issues	32	15.84	
unfamiliarity/Less proper guidance available (unlike face2face session)/It is not to easy and not too hard	13	6.43	lecturer didn't give enough brief about certain topics, learning using just video provided took long to understand/I've submitted my assignments in *Teams* (already clicked the handed in button) but my lecturer told me I've not handed in the assignments yet and I've lost my marks there.
time management/Sometimes class overlapped	8	3.96	transforming physical classes schedule as it is to online classes is not appropriate as we have different obligation such as family commitment, different sleeping time etc.
Frustrated with this new environment	24	11.88	Can't focus, hard to understand through video lecture/Communication between students and lecturers were limited/The general environment is not good compared to physical class. Less interaction with lecturer

TABLE 4. The more convenient way to deliver online classes by respondents.

Which is more convenient replacement for physical class	%
Uploading videos using Panopto, Slides to VLE, and communicate via WhatsApp or other means	31.9
Using Microsoft Teams	19.9
Using Panopto with longer Submission	47.1
Uploading videos using Panopto, VLE and using Microsoft	0.6

TABLE 5. The Impact of lockdown on respondents' status.

Lockdown has negative impact	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean
Financially	8 2.8%	20 7%	74 26.1%	61 21.5%	121 42.6%	3.9
Psychologically	4 1.4%	15 5.3%	58 20.4%	62 21.8%	145 51.1%	4.1
Communication with classmates and group members	6 2.1%	14 4.9%	54 19%	160 56%	50 17.6%	3.8
Performance	7 2.5%	8 2.85%	36 12.7%	61 21.5%	172 60%	4.3
Communication with Family members	14 4.9%	23 8.1%	164 57.7%	49 17.3%	34 12%	3.2

supported the use of ''Panopto'', uploading slides to VLE, and communicating via social media tools such as WhatsApp.

There were five negative perspectives impacted by lockdown as investigated with respondents, which are financial, psychological, communication with classmates, academic performance, and communication with family members. Table 5 lists respondents' feedback from the five-point Likert scale questions. The mean value on finance was in agreement, which revealed that a considerable number of respondents' financial statuses were negatively influenced. Similarly, the mean value revealed that the respondents' psychological statuses were negatively influenced.

The same scenario was observed in terms of communication with group members/classmates and academic performance, while neutral tendency was observed on communication with family members. This could be explained by the fact that the majority of respondents spent their time during lockdown in their own houses. Furthermore, based on the mean values, the major negative impact of lockdown as reported by respondents was on their academic performance and psychological status.

A. EXPLORING THE DIFFERENCES AMONG RESPONDENTS' GROUPS
B. GENDER GROUP

To explore the differences among female and male respondents toward the lockdown impact on their financial and psychological statuses, communication, and performance, t-test was used. There was a significant difference in terms of financial impact of lockdown among males (M = 4.19, SD = 1.02) and females (m = 3.34, SD = 1.05), t (6.37) = 282, p = 0.000. This reveals that male respondents showed that the lockdown impacted them more financially than female students. Male respondents (M = 4.35, SD = 0.93) also reported that the lockdown impacted their psychological statuses more negatively than female respondents (M = 3.70, SD = 1.067), t (5.12) = 282, p = 0.000. The third difference

was found among male and female respondents, related to communication with group members and classmates. Male respondents (M = 3.90, SD = 0.73) found it difficult to communicate with other group members and classmates, while female respondents found it less difficult (M = 3.62, SD = 1.04), t (2.61) = 282, p = 0.009. The fourth difference was found regarding the implication of lockdown on respondents' academic performance. Male respondents (M = 4.50, SD = 0.87) were more worried on the negative impact of lockdown on their academic performance compared to female respondents (M = 4.00, SD = 1.10), t (4.04) = 282, p = 0.000.

Finally, the top challenge among female respondents was unstable and limited Internet connection, whereas, the top challenge among male students was a combination of lack of computers with good performance, unsuitable environment (houses) to study, and not ready to move entirely to online platform.

C. AGE GROUP

This study explored the differences among age groups of the respondents in terms of the lockdown impact on their financial and psychological statuses, communication, and performance. One-way ANOVA test was employed. A significant difference among age groups was observed in terms of the effect of lockdown on their financial statuses at p < .001 for two age groups [F (2,281) = 16.39, p = 0.000]. Post-hoc comparisons using the Tukey HSD test indicated that the mean for age group 18–22 (M = 3.39, SD = 0.95) was significantly different than the age group 23–25 (M = 4.16, SD = 1.08). However, the age group 26+ (M = 3.25, SD = 0.95) did not significantly differ from other age groups. It seems that younger respondents (18–22) were less concerned about the impact of lockdown on their financial statuses compared to those in age group 23–25, who were the most concerned. However, the eldest group 26+ showed the least concern about the financial impact of lockdown.

Another difference among age groups was the lockdown impact on psychological status, where one-way ANOVA was used. There was a significant difference at p < .001 for two age groups [F (2,281) = 12.30, p = 0.000]. Post-hoc comparisons using the Tukey HSD test indicated that the mean for age group 18–22 (M = 3.70, SD = 0.98) was significantly different than the age group 23–25 (M = 4.33, SD = 0.98). However, the age group 26+ (M = 4.5, SD = 0.57) did not significantly differ from other age groups. This reveals that the age group 23–25 perceived the lockdown to have an influence on their psychological status. This group, apart from 26+ age group felt that they were less ready to continue studying at home for the remaining weeks of the semester.

The third perspective explored was the difference among age groups in terms of the lockdown impact on respondents' academic performance. One-way ANOVA test was applied. There was a significant difference at p < .005 for two age groups [F (2,281) = 5.49, p = 0.005]. The Tukey HSD test indicated that the mean for age group 18–22 (M = 4.06,

SD = 1.00) was significantly different than the age group 23–25 (M = 4.44, SD = 0.95). However, the age group 26+ (M = 5.00, SD = 0.00) did not significantly differ from other age groups. It seems that respondents of age 22–25 (probably in the 3rd or 4th year of their study) were more concerned about their academic performance and the impact of lockdown that might probably reduce their earned marks.

On the other hand, no difference was found among age groups in terms of the impact of lockdown on communication with classmates and family members, which might be expected due to the availability of modern communication technologies.

D. STATES GROUP

It is important to measure the differences among the states, because there are variations in terms of distance from the campus, Internet accessibility, and family income. Hence, differences on the impact of lockdown on students' financial and psychological statuses, communication, and performance were expected. One-way ANOVA test was utilized to investigate the differences. There was a significant difference among states in terms of the lockdown impact on their financial status at p < .001 [F (11,272) = 17.02, p = 0.000]. Tukey HSD test showed that the mean for respondents from Pulau Pinang (M = 4.8, SD = 0.52) was significantly different than respondents from Kuala Lumpur (M = 3.38, SD = 1.13), Selangor (M = 3.38, SD = 1.13), Kedah (M = 3.52, SD = 0.60), Terengganu (M = 3.17, SD = 1.01), Kelantan (M = 3.50, SD = 1.50), Johor (M = 3.42, SD = 0.64), Negeri Sembilan (M = 3.70, SD = 0.1.49), Perak (M = 3.28, SD = 0.78), Pahang (M = 3.25, SD = 0.88), and others (M = 3.35, SD = 1.08). This indicates that respondents from Pulau Pinang were more concerned about the financial impact of lockdown than other respondents from other states and cities, except respondents from Melaka.

Regarding psychological status, a significant difference was observed among states in terms of the impact of lockdown on their psychological status at p < .001 [F (11,272) = 9.71, p = 0.000]. The Tukey HSD test indicated that the mean for respondents from Pulau Pinang (M = 4.84, SD = 0.57) was significantly different than respondents from Kuala Lumpur (M = 4.07, SD = 1.016), Selangor (M = 3.79, SD = 1.11), Kedah (M = 3.7, SD = 0.71), Terengganu (M = 3.59, SD = 1.28), Kelantan (M = 4.1, SD = 0.77), Johor (M = 3.64, SD = 0.84), Negeri Sembilan (M = 3.60, SD = 1.07), Perak (M = 3.67, SD = 1.1), Pahang (M = 3.75, SD = 0.88), and others (M= 3.50, SD = 1.09). This indicates that respondents from Pulau Pinang were more worried about the lockdown impact than respondents from other states and cities, except those from Melaka.

A significant difference among states was observed in terms of the lockdown impact on their academic performance at p < .001 [F (11,272) = 8.76, p = 0.000]. Tukey HSD test showed that the mean for respondents from Pulau Pinang (M = 4.92, SD = 0.36) was significantly different than respondents from Kuala Lumpur (M = 3.92, SD = 1.16), Selangor

(M = 3.79, SD = 0.97), Kedah (M = 4.09, SD = 0.89), Terengganu (M = 4.05, SD = 1.19), Johor (M = 3.42, SD = 1.01), Negeri Sembilan (M = 3.70, SD = 1.15), and Perak (M = 4.09, SD = 1.17). It seems that respondents from Pulau Pinang perceived the lockdown to have an influence on their academic performance marginally more than respondents from Kuala Lumpur, Kedah, Terengganu, and Perak. Meanwhile, when compared to respondents from Johor, Negeri Sembilan, and Selangor, respondents from Pulau Pinang were considerably concerned about the impact of lockdown on their academic performance.

Respondents from Kelantan (M = 4.68, SD = 0.60) showed differences in terms of lockdown concerns on their performance compared to those from Selangor (M = 3.79, SD = 0.98) and Johor (M = 3.42, SD = 1.01). It can be inferred that respondents from Kelantan were more concerned about the influence of lockdown on their academic performance than those from Selangor and Johor.

Finally, this study found no differences among respondents from several states and cities of Malaysia in terms of the lockdown impact on their communication with classmates and their group members. This reveals an agreement among the respondents that the lockdown influenced their communication with classmates and group members negatively. The main value was 3.8. However, they were neutral (the mean value was 3.2) in terms of the negative impact of lockdown on their communication with family members. This was expected as 90.8% of respondents managed to return home which reduced the impact of lockdown on their family communication.

Regarding the open and free-text answers, all respondents who gave feedback repeated their input from the previous questions. Yet, they emphasized on the need to follow new paradigm in terms of communication with students, assignment, and assessment.

V. DISCUSSION

A substantial number of respondents of this study mainly complained about Internet access instability. Moreover, their computing devices were not capable to keep up with the requirements of pure online learning environment, as they faced difficulties to install and/or run software that require high performance in their basic computing devices. This is in line with the findings from [13], [15], [17], [41], [45]. In agreement with Pui Yee [15], Kapasia, *et al.* [45], a considerable number of respondents of this study reported of Internet instability (considerably rely on their mobile data plan), which may reveal their living conditions in rural areas where fixed line Internet connections are not installed in their respective houses. In terms of unsuitable study environment (houses), the findings by Pui Yee [15], Lim [17], Kapasia, *et al.* [45], Lau, *et al.* [46] have supported this study. A substantial number of respondents reported difficulty to study and complete assignments from home, similar to the findings of Upadhyaya, *et al.* [9]. They reported loss of motivation, noise distraction, and family responsibilities. The

findings of this study have supported the suggestion by Dickinson and Gronseth [42], which is the consideration towards variances in learners' preferences and capabilities, motivational characteristics, and environmental constraint, during curricular design.

This study had empirical evidences regarding the issues in education process during the COVID-19 lockdown from students' perspective which was barely investigated by studies found. For instance, the study of Dickinson and Gronseth [42] developed recommendations for students based on reviews of current curriculum and online learning systems with minimum input from them. Other studies mainly focused on educators and how smoothly the online systems were used or finishing the current semester appropriately with less impact on education quality. Students' feedback was moderately considered, yet, when considered, it was mainly about the technical difficulties they may encounter.

Additionally, respondents found difficulty in maintaining good communication with lecturers and classmates. The major obstacle reported is that respondents were used to physical communication with lecturers and classmates. Online communication was comparably difficult as it was hard to know the proper time to communicate with lecturers and classmates as many had different conditions. For example, some of them reported that they had to travel a few kilometers to reach places with stable Internet connection, while others reported sharing computers with other family members or got caught with family responsibility. Moreover, Internet instability only enabled one-way communication with lecturers during online classes. Respondents found it difficult even to receive sustained and clear voice stream from lecturers.

The financial impact of lockdown was the major concern of respondents (21.5% said agree, 42.6% said strongly agree). They were forced to repeatedly purchase Internet data plan due to high consumption during online classes, purchase more expensive Internet data plan, or visit the nearest place with Internet access. They were also concerned about not graduating on time which may prompt sponsors to stop financing them. Those results barely found similarities in prior studies, as they mainly focused on other aspects, apart from financial impact on students.

Another impact of lockdown was psychological readiness for this new education environment. Approximately 72.9% of respondents said they agreed or strongly agreed on the lockdown impact on their psychological status, which is in line with findings of Upadhyaya, *et al.* [9]. Respondents revealed their unreadiness to move completely to the new environment. Respondents reported that their houses were not a suitable environment for online education due to noise, no private room, having to share computing devices with family members, family responsibility, and difficulty to get off the comfort zone (feeling sleepy with irregular sleeping patterns). Consequently, respondents were worried that their academic performance will be affected. The respondents' concerns might be due to several reasons such as inability to keep up with online classes and assignments due to Internet

connection problems and difficulty to learn from home. The challenges were limitedly discussed in prior studies. This study enriched the discussion on the psychological impact of changes in education process.

In terms of course curriculum modification that was mainly developed for face-to-face education to account for the emerging challenges of lockdown, the work of Durfee, *et al.* [50], Gomez, *et al.* [51] reported the acceptance of students and increase in number of students registered in modified courses, which may reveal the need for them. However, the samples in [50, 51] were limited and further studies are required to confirm the result.

Students from various states of Malaysia showed variances in the concerns. The ANOVA test revealed that students showed differences regarding the challenges of lockdown on their financial and psychological statuses and academic performance. This was expected due to variances in Internet penetration and family incomes among states. Considering the variances among students based on their states was rational due to the variances among students' families and rate of Internet penetration among states. This study also found empirical evidences where considerations on students' financial capabilities and psychological readiness were recommended.

Based on the literature found, most universities in Malaysia have the infrastructure to run online learning environment, yet, this study found that students encountered difficulties as most of them live in rural areas and rely considerably on Internet connection from their mobile phones. They also rely on university facilities (computer labs and equipment) to run heavy software (simulation environment, operating systems, Database Management system, programming development environments, etc.) that are difficult to be run on their personal computing devices. This study supports the recommendations by Mirza [1], Plancher, *et al.* [3], Chertoff, *et al.* [5], Hilburg, *et al.* [6], Balhareth, *et al.* [11], Chick, *et al.* [26], Kapasia, *et al.* [45], Rajhans, *et al.* [53], Almarzooq, *et al.* [59] to reinvent higher education to be ready for similar crisis in the future. However, their recommendations were mainly based on discussions with academic staff or curriculum evaluation with rare input from students, which was covered in this study. Although studies by Upadhyaya, *et al.* [9], Kapasia, *et al.* [45] were conducted in India (West Bengal and Delhi-NCR regions respectively), with different facilities from Malaysia states, the results of these studies showed similar concerns regarding the learning process during lockdown. This could be interpreted as that the variances in students' access to education during lockdown are similar globally.

This study is in line with Lim [17] who reported that students complained of more required assignments by lecturers in online learning environment. Respondents of this study reported that they received more assignments in online environment compared to face-to-face. Yet, this study contacted students in contrast to Lim [17] who contacted a few students from the student representative council, making the results of this study more extensive Mirza [1], Stambough, *et al.* [8], Li and Lalani [13], Rajhans, *et al.* [53] saw COVID-19 as an opportunity for education sector to reengineer its process in order to handle similar situation in the future. Education is among the sectors that is the least digitally transformed. This study has perceived that the recommendations by Mirza can help Malaysian universities to avoid similar situation in the future.

VI. CONCLUSION, RECOMMENDATIONS, AND FUTURE WORKS

The COVID-19 pandemic has changed the world and prompted countries to enforce lockdown, including education systems. Students around the world have been taken by surprise, transforming education process entirely. Malaysian students are among those impacted by the lockdown. Literature have shown that universities' online systems are ready for such transformation technically. However, students were not perfectly ready for this situation. Due to unequal Internet accessibility, students encountered interrupted live streams of the lectures, which burdened them. Moreover, they found that their houses were not a suitable environment for learning due to family and comfort factors. Students reported difficulties to communicate with lecturers and students, and were concerned about the impact on their academic performance as they were not psychologically ready for this situation.

In contrast to distance learning students who have chosen to pursue higher education online with ready environment for that purpose, students in this study were forced to study online. They were not ready physically (have basic and simple Internet connection via their mobile phones, rely heavily on university facilities to meet group members, complete assignments, and do projects) and psychologically (used to be in hostels regularly, going to classes and using library and labs to meet group members and do assignments, instead of being isolated in an unsuitable environment). Consequently, respondents reported their concerns on the implication of this situation on their performance. There is a need for programs that consider this situation [57], employing further investigation to measure the transformation impact of pure online education on students' performance [53].

Currently, online education of Malaysian universities only serves to support face-to-face education process. The university in this study found it a challenge to fit curriculum and assessment into pure online teaching approach, which seems to be impacting education globally [8], [42], [50], [51], [57]. At the same time, instructions and guidelines provided by the Ministry of Education were too abrupt and insufficient time was given to adapt to this new normal.

It is recommended to evaluate those semesters that took place during the COVID-19 pandemic which are expected to not meet the standards and measurements of higher education around the world. This is the first time that students and lecturers went through this unfamiliar situation and challenges (academic, communication, technical, etc.) that affected the education process in terms of the quality

of lectures, lab experiments, and assessments. Universities should prepare for post COVID-19 as education has been significantly exposed to changes [10] that may transform it in the future [8], [42], [53].

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