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Exploring University Students' Online Learning Readiness: A Mixed Methods Study of Forced Online Learning

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ABSTRACT

Background: Despite the advancement achieved in previous research into online learning, few studies have used both quantitative and qualitative data to examine how students' readiness to learn online is affected by three different external factors, comprising (i) the degrees to which technology is available to students, (ii) the support provided by the institutions of learning, and (iii) the social influence affecting the students engaged in forced online learning in a pandemic situation.

Purpose: To fill this research gap, this study explored university students' forced online learning readiness in relation to technological accessibility, institutional support and social influence during a pandemic, in an attempt to furnish insights into how educators can maximize the benefits of adopting online learning methods.

Method: A mixed methods research design was employed in this study. Quantitative data, elicited via self-administered questionnaires completed by 211 participants, was analyzed using the frequencies, means, standard deviations and Pearson correlation analysis involving the Statistical Package for the Social Sciences (SPSS) software version 27. Qualitative data, elicited via 11 open-ended questions posed to 41 students through in-depth interviews, was then studied using a thematic analysis of the participants' feedback concerning the three constructs in online learning.

Results: Our quantitative analysis showed that institutional support had the strongest positive correlation with online learning readiness, and this was followed by technology accessibility and social influence in relation to students' readiness to learn online. Qualitative findings further indicated that students were largely concerned about Internet accessibility and the setting where their roles were restricted to being mere listeners in online sessions. Apart from being apprehensive about excessive online assignments, students also acknowledged that their online interactions were influenced by their friends and family members, and they would prefer practical work that could inspire them to reflect and engage actively with the course material given during the pandemic.

Conclusion: While lecturers can make online classes more interactive and discussion-generative, university administrators need to aptly facilitate their institution's transition to the forced online learning mode, moderate social influence, improve the learning management system, and provide training to teachers and students on the use of emerging technology.

KEYWORDS

institutional support, online learning, social influence, students' readiness, technology accessibility

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INTRODUCTION

Online learning has become increasingly important in tertiary education in view of its efficiency to enable education to be carried out with lower costs and greater accessibility. This learning mode has been promoted as a strategy to solve traditional educational problems relating to the lack of classrooms, workforce, and faculty (Baber, 2021; Linjawi et al., 2012). Online learning assists in catering to var-

ious learning styles and can be a main success element in teaching and learning (e.g., Almaiah et al., 2020; Tabang & Caballes, 2022). When integrated with conventional classroom learning, online learning can have a greater impact on students' satisfaction, self-assessment, and motivation. It can be implemented via self-paced independent units, or conducted through the use of asynchronous and synchronous interactive sessions. The former enables students to view instructional materials that exclude a live lecture component, at any time convenient to them while the latter involves meetings of participants and their instructor in real time after logging in to the virtual meeting platform (Dhawan, 2020; Ryan, 2001).

In view of the aforementioned convenience of online learning, institutions of higher learning have implemented online education in their programmes by integrating online and traditional forms, known as blended learning, to meet students' learning objectives (Allen & Seaman, 2003; Graham & Dziuban, 2008). Singh and Thurman (2019) noted that blended learning, in addition to online learning, has been a part of teaching in higher institutions for almost two decades. In fact, more and more university courses and programmes have included the integration of online learning with physical face-to-face learning in order to meet the related instructional objectives (Fitzpatrick, 2012) in response to Education 4.0, which mandates higher institutions to switch their educational paradigm from technology acceptance to dynamic instruction and pedagogies. Such a transition requires us to first understand the Technology Acceptance Model (TAM), which posits that users' attitude towards the employment of a technology is connected with (i) the degree to which the technology is perceived as being easy to use, and (ii) the extent to which it is perceived as being useful in meeting a purpose (Davis, 1989). The emphasis on dynamic online instruction therefore implies that online learning strategies need to be seriously studied by considering how active learning is associated with students' attitudes towards the technology available in instructional sessions.

The move to online learning is particularly pertinent in view of the Movement Control Order (MCO) and lockdown resulting from the pandemic during which face-to-face classes were not possible, while online learning strategies became crucial and unavoidable (see Baber, 2021; Dhawan, 2020). According to Murphy (2020, p. 1), "following the logic of the exception - that extraordinary times call for extraordinary measures", education systems around the world had to respond to the pandemic with "emergency e-learning protocols" that included online instructions that might not have been planned appropriately. However, according to Al-Shehri (2010) and Reyes-Millan et al. (2023), difficulties and challenges will often come with any change, particularly technology accessibility, institutional support and social influence. As identified in past studies, students generally face some online learning challenges such as feeling frustrated, worried, confused (Hara & Kling, 2000; Piccoli et al., 2001) and isolated (Gherghel et al., 2023). Learners also feel that they need to be more disciplined and self-motivated to commit more time to online learning, and to improve on their writing skills (Golladay et al., 2000). While it is clear that students' frustration, anxiety and confusion may be attributed to the accessibility of the online technology available to them, such emotions may also be ascribable to the amount of support they normally receive from their institutions. More importantly, it is unclear whether students are frustrated, worried and confused because of the influence from their peers in the same institution. These three variables, referred to as technological accessibility, institutional support and social influence, constitute the focus of this inquiry, and are studied in relation to students' readiness to learn online in a pandemic situation. Under such difficult circumstances, it is understood that "the pandemic forced teachers and learners to abandon familiar teaching and learning routines" (Hoss et al., 2021, p. 5), or more precisely, universities "were forced to adjust their established routines and concepts of teaching and learning" while attempting to create remote study environments online (Hoss et al., 2021, p. 1).

The aforementioned studies indicate that there has always been a constant need to undertake research that aids in obtaining qualitative and quantitative findings which can maximise the benefits of adopting online learning methods in some important dimensions relating to the availability of technology, the support given by an institution, and the influence from the students' learning environment. The objective of the present study was to ascertain whether our university students' online learning readiness (OLR) was significantly correlated to technology accessibility, institutional support and social influence at a university during the pandemic. This means that we were unsure whether these three independent variables would be significant factors affecting OLR in the regional context of this study during the pandemic. To bridge the research gap, this study proposes the following hypotheses:

H1: Technology accessibility has a significant effect on university students' readiness to learn online during the pandemic.

H2: Institutional support has a significant effect on university students' readiness to learn online.

H3: Social influence has a significant effect on university students' readiness to learn online.

This study aimed to advance the extant body of knowledge on students' online learning experiences in a developing nation as it responded to Adnan and Anwar's (2020), Almaiah et al.'s (2020) and Baber's (2021) calls to examine students' views on online learning during the pandemic, given that students' voices constitute a vital dimension that merits attention in this issue (see Mailizar et al., 2020). It is likely to enrich the current literature by first quantitatively assessing the association between the dependent variable (i.e., students' readiness to learn online) and each of the three in-

dependent variables, comprising technology accessibility, institutional support and social influence, before moving on to qualitatively investigate students' behavioural patterns in online learning while they were encountering challenges during the MCO period. The findings from the present study could provide faculties and academic institutions with insights into students' learning experience, thus enabling institutions and academicians to adapt their teaching methodology and make informed decisions on how to fully exploit the potential of online technology in the teaching and learning process. This inquiry constitutes an extension from the technology acceptance model (TAM) and extended technology acceptance model (ETAM), and our main focus is largely on the degrees to which the three aforementioned factors are correlated to online learning readiness. Given the focus, it is necessary to review some previous studies concerning (i) the TAM and ETAM, and (ii) each of the three major independent variables which may have a bearing on online readiness that constitutes the dependent variable in this study.

Literature Review

Technology Acceptance Model

The technology acceptance model, established by Davis (1989), describes the factors that determine the acceptance on the use of computers and suitable technologies in different user groups. The model (i) presents the relationships between two personal beliefs, namely 'perceived ease of use' and 'perceived usefulness', and (ii) explains how they are influenced by external and system-specific factors. It was found that these two beliefs could be used to predict users' attitude towards using a technology. The attitude towards the use of technology then affects the behavioural intention to use a technology, which eventually predicts the actual system use (see Figure 1). TAM has been employed in various past studies relating to online learning, and literature relating to technology acceptance (Alkis *et al.*, 2014; Holden & Rada, 2011).

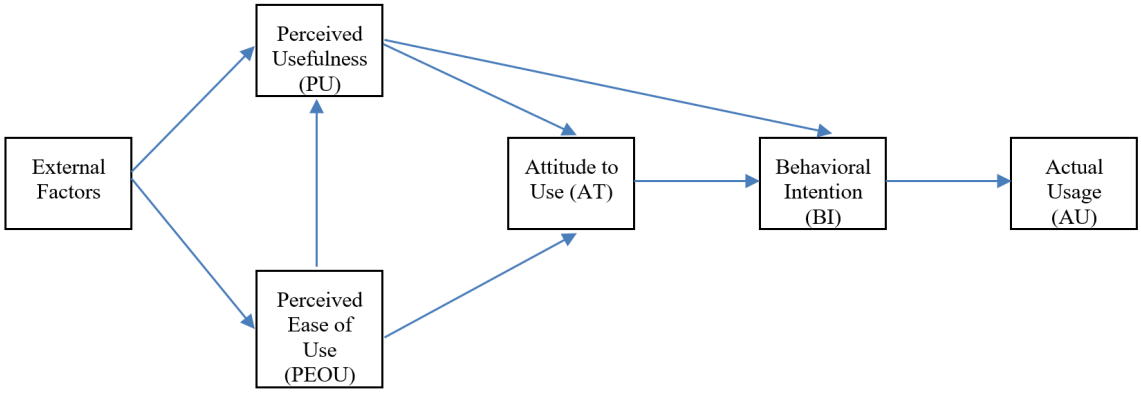
One such study using the technology model as the term of reference was conducted by Linjawi and Alfadda (2018) in which they examined the perception, attitudes, and readiness of a cohort group in dental education on the challenges of online learning in Saudi Arabia. A detailed questionnaire was used to examine the six primary domains, with each consisting of multiple subdomains. The six primary domains were the (i) individual characteristic domain, (ii) system competency needs domain, (iii) social influence domain, (iv) institutional support domain, (v) overall readiness domain, and (vi) needed technical support domain. The questionnaire comprised 34 questions on a 5-point Likert scale, five multiple-choice questions, and two open-ended questions. Among the noteworthy findings were that (i) social influence on online learning was acceptable but not too high for all participants at all levels, (ii) the institutional support was considered important by all participants at all levels, and (iii) the top-down implementation by the administrators to the users was important and a more sustainable strategy. The study showed that the participants perceived that the use of technology in dental education was important; however, as students matured, they perceived the impact of and readiness for e-learning to be less accepted and they reported that they needed more support in some skills.

Extended Technology Acceptance Model

The extended technology acceptance model (ETAM) proposed by Salloum (2018, p. 17), being a subsequently posited model with more detailed features, was applied as the guiding principle in this research. The model was made up of 13 constructs, comprising "computer self-efficacy, subjective/social norm, enjoyment, system quality, information quality, content quality, accessibility, computer playfulness, perceived usefulness, perceived ease of use, attitude toward using, behavioral intention to use, and actual system use". Of these factors, the first eight factors were posited as the external factors that could affect students' readiness to learn online. It was also claimed that six of these eight factors (namely system quality, information quality, computer self-efficacy, enjoyment, accessibility, and computer

Figure 1

Technology Acceptance Model (TAM) by Davis (1989)



playfulness) all led to an increase in the students' perceived ease of use and/or perceived usefulness of online learning. Among these six factors, self-efficacy understandably had a greater impact on online learning readiness, but in the context of this study, technology accessibility constitutes a basic external factor that deserves greater attention, given that the university where this study was conducted had formally started online learning only six years before the research commenced. This explains why it was necessary to seek more information on a possible interrelationship between online learning and technology accessibility, particularly in the context of the pandemic when access to technology was of major concern. Studying the interrelationship appears pertinent given that technology accessibility, according to Salloum (2018), could be related to online learning readiness, which in turn could depend on students' 'perceived ease of use'. The perceived ease of use was reported to have an effect on 'perceived usefulness' (Sallom, 2018), which in turn could have an effect on 'attitudes' and 'behavioural intention' in online learning. From this perspective, these results are largely consistent with the original theoretical foundation of TAM (Davis, 1989).

In the context of this study, other TAM constructs such as 'attitude', 'behavioral intention' and 'actual use' were grouped under a single factor renamed as 'learners' readiness' because they were exactly part of the learners' own characteristics, unlike technology accessibility which constituted a major external factor affecting learners' online learning readiness. Furthermore, two other external factors, namely 'institutional support' and 'social influence', originally also proposed in Davis' (1989) TAM model, are given attention in our proposed model because their possible inter-relationships with online learning have been reported in prior studies, and they are likely to have a bearing on online learning readiness. In particular, Linjawi and Alfadda's (2018) reported that 'institutional support' and 'social influence' were independent variables that could influence online learning readiness. To further consider the interrelationships between online readiness and each of these three independent variables, a detailed review is provided in the following subsections.

Technology Accessibility

Technology accessibility was described as having "access to the necessary technologies to take advantage of online education" (Ferri et al., 2020. p. 6). This study considers technological accessibility as an easy access to the Internet/Wi-Fi in addition to the technological tools used for learning online, such as mobile phones, laptops and computers. Technology accessibility has been found to be an important factor that affects student online learning (Ahmad *et al.*, 2020, Salloum, 2018). In addition, according to Dogruera et al. (2011), access to the Internet in the educational setting has facilitated information sharing via online resources. In addition, an inter-relationship between technology accessibility and online learning readiness also showed that insufficient access to the Internet, availability of the Internet service, and the lack of the latest technology could have an impact on online learning readiness.[1] Likewise, Mukhtar et al. (2020) held that the Internet connectivity issues, being part of technology accessibility, could be negatively correlated to learning through online modalities.

Another prior study that revealed a noticeable interrelationship between technology accessibility and online learning readiness was Tuntirojanawong's (2013) work, which demonstrated that technology accessibility might contribute the most to the online learning readiness among the graduate students majoring in education administration as it had the highest mean compared to other variables. More specifically, Jaffar et al. (2022) showed that students were more ready for online learning when they could easily access their electronic devices such as laptops and smartphone for the learning process, especially while they were attempting to adapt to the new educational norms during the pandemic.

Institutional Support

Institutional support refers to the provision of various types of support for stakeholders (e.g., faculty, students) and processes (e.g., course development) for facilitating the transition to online education (Pedro & Kumar, 2020). Institutional support is essential to provide effective and efficient student online learning delivery (Dhawan, 2020). Managers of learning management systems in higher institutions play a vital role in enhancing the implementation process of an e-learning system for both lecturers and students (Salloum, 2018). As stressed by Hodges[2], students had to learn online not because they decided to venture into online learning, but because the institutions concerned had mandated that faculty move their course online to prevent the spread of the virus concerned. They noted that effective online learning materials that promoted learning experiences had to be given to students. They further elaborated that institutions had to take steps to reduce the digital divide as the unavailability of digital tools and the lack of Internet or Wi-Fi access would cause many students to lose the opportunity to learn online. On the same note, institutions were expected to support

[1] Zhong, R. (2020). The coronavirus exposes education's digital divide. https://www.nytimes.com/2020/03/17/technology/china-schools-coronavirus.html.

[2] Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). *The difference between emergency remote teaching and online learning.* https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

students' online learning by (i) providing relevant training and student orientation in using online learning tools, and (ii) furnishing them with the necessary equipment for using the learning management system, e-learning, and academic-type competencies (Dhawan, 2020; Mukhtar et al., 2020).

On the one hand, the pandemic sped up the embedded digitalisation and digital ways of working in organisations or institutions, but on the other hand, it required an urgent need for institutions and policy makers to develop initiatives to reach users from disadvantaged backgrounds, such as those with low skills and those of older age (Webb et al., 2021). The important role of institutional support has pointed to the need to examine a possible interrelationship between institutional support and online learning readiness. Institutional support was also found to be a common factor that had a great impact on students' readiness to learn online (e.g., Lee et al., 2011; Linjawi & Alfadda, 2018; Yukselturk & Yildirim, 2008). A more recent study on forced online learning readiness in a pandemic situation also showed that institutional support, particularly in the form of technology infrastructure and Internet speed provided by institutions, could vastly affect students' perceived enjoyment in online learning (Maheshwari, 2021). However, it was found that although institutional support does have a relationship with online learning intention or readiness, "the relationship was found to be negative" (i.e., -0.24, $p<0.05$). This explains why we were unsure whether institutional support will have a positive or negative impact on students' online learning readiness during the pandemic in the context of this study.

Social Influence

Social influence is defined as the degree to which an individual perceives that "others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). Social influence has been found to be an external factor that could have a relationship with student online learning (Al-Ammary et al., 2014; Elkaseh et al., 2015; Farahat, 2012; Salloum, 2018). The interaction between the teacher and student material, alongside emotional and social support, has been found to be essential for effective learning, as acknowledged by Mukhtar et al. (2020). Students tended to contact their course instructor via email, and this method needed response time. In addition, full real-time sharing of ideas and information was not possible for online classes and this situation could be of interest to tactile learners (Britt, 2006). Restriction of social interaction, in general, can cause distress to those affected as social interaction is widely interconnected with psychological wellbeing (de Luca et al., 2021).

A possible interrelationship between social influence and online learning readiness can also be understood from the perspective of mental health, given that students may be less inclined to learn online if their social life is affected to a great degree, especially during the pandemic (Cao *et al.*, 2020; Odriozola-Gonz´alez *et al.*, 2020). The lack of social interaction may result in some critical situations that require educators to closely monitor students' online learning readiness, especially by showing sufficient empathy towards students (Azlan *et al.*, 2020; Cao *et al.*, 2020; Odriozola-Gonz´alez *et al.*, 2020). In this regard, past research showed that the use of social networking technologies, such as web 2.0 and social media tools in learning, could create "a sense of presence, community building, and learner participation in interactive discussions" (Veletsianos & Navarrete, 2012, p. 146). In general, online learning functions as an educational platform that promotes social connection among users by allowing them to discuss and get immediate feedback (Greenhow, 2011). However, we are unsure whether in the context of the current study, social influence has a significant impact on students' learning readiness, since instructors had started online learning only several years before the onset of the pandemic.

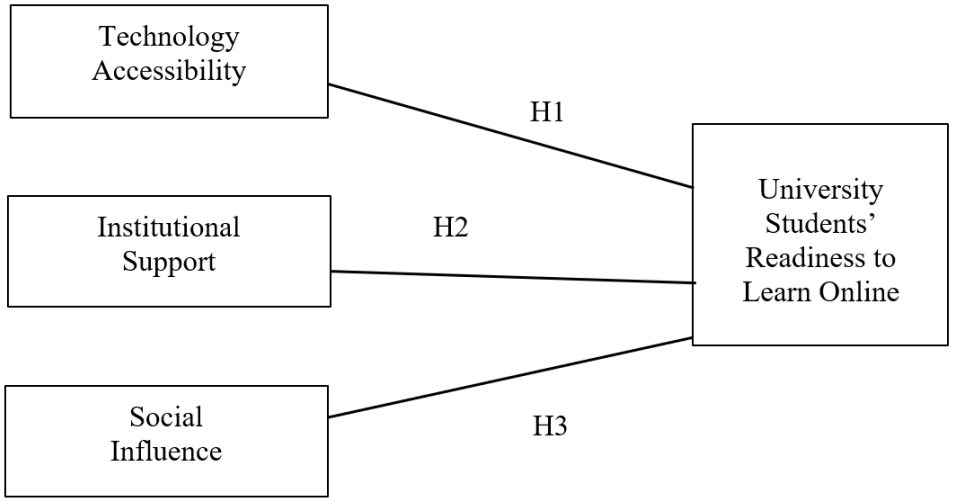
Overall, based on the review of studies relating to the three independent variables in relation to online readiness (as the only dependent variable), the proposed research framework is illustrated in Figure 2.

Previous research has highlighted TAM's inadequacies in addressing the link between technology and actual adoption and use of technology (Hai & Kazmi, 2015; Lim *et al.*, 2016). Among these limitations, Laugasson et al. (2016) held that when using open-source software, especially in schools in developing countries, TAM is not particularly relevant as a research framework to predict and explain the acceptance and use of technology. One argument is that the TAM model's "ease of use" and "usefulness" may not have been the most influential factors (Laugasson et al., 2016). This is because the technology adopted at a particular time can easily and conveniently be replaced by another free and open-source technology. The ETAM model (Salloum, 2018, p. 17) is therefore also referred to in this study that focuses largely on the interrelationships between online learning readiness and the three major independent variables, comprising technology accessibility, institutional support, and social influence.

This study focused exclusively on the aforementioned interrelationships because our literature review has shown that not all factors, as explained above, could be major external factors affecting online learning readiness (see Salloum, 2018). As such, in order to elicit detailed information on some major interrelationships reported in literature, it would be important to focus on three major factors that were more likely to affect online learning readiness in a pandemic situation. Firstly, technology accessibility was given the focus because accessibility to online facilities constituted a major issue as students had to resort to online platforms when physical face-to-face classes were not possible during the pandemic, and it was not clear to what extent

Figure 2

Proposed Research Framework Relating the Three Independent Variables with Online Learning Readiness Functioning as the Dependent Variable



their readiness could be affected by the degree of accessibility. Secondly, institutional support had to be examined in that students' readiness to learn online could be affected by the degrees to which they were encouraged by the universities where they were studying during the pandemic. Such support could vary across different areas or regions, thus explaining why more data on institutional support is needed. Thirdly, social influence became part of the focus of this inquiry in view of the physical distancing needed during the pandemic, which made it necessary to examine how influence from other individuals could still have a bearing on their online learning readiness. Given the motivation, the following section provides details pertaining to the methodology used to examine the interrelationships between the aforementioned variables and the behavioural patterns of the students during the pandemic.

METHOD

Research Design

A mixed methods research design was employed in this research, in which the quantitative component was executed using self-administered questionnaires, while the qualitative component was conducted through in-depth interviews. This "explanatory sequential (QUAN - qual) design" was used given that quantitative data was collected first and was "more heavily weighted" than were qualitative data (Mills & Gay, 2019, p. 431). In the first phase, we formulated hypotheses, collected quantitative data, and conducted data analysis. The findings of the quantitative phase were then used to determine the type of data collected in the second phase, which focused on collecting, analysing and interpreting the qualitative data. This means that we used a qualitative analysis and an interpretation to help us explain and elaborate on our quantitative results (Mills & Gay, 2019).

Quantitative Research Procedures

Participants in the Quantitative Component

A total of 300 university students were initially approached at the higher learning institutions in Sabah, Malaysia, and 211 of them provided complete answers to a self-administered questionnaire, yielding a 70% response rate. The participants were provided with the link to access the questionnaire in Google Form.

Instrument and Measures

The online self-administered questionnaire consisted of two sections. Section 1 required students to provide information on their demographic profiles, while Section 2 consisted of 24 items that elicited information on students' perceptions of technology accessibility, social influence, institutional support, and learner readiness (Table 1).

The measures of technology accessibility (5 items), social influence (5 items), institutional support (5 items), and learner readiness (9 items) were factors developed from previous TAM studies (Linjawi & Alfadda, 2018; Salloum, 2018) to meet the current study environment. These measurement items were measured on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1

Measurement of Items on Online Learning Experience

Dimension	Label	Item
Technology accessibility	TA1	A fairly new computer/laptop (e.g. with a high speed, large memory, speaker and Webcam.
	TA2	A computer/laptop installed with adequate software (e.g., the latest versions of Microsoft Office, Adobe Acrobat and Real Player Internet Explorer).
	TA3	A fast Internet/Wi-Fi connection at home.
	TA4	A mobile technology (e.g., iPhone, iPad and Smartphone).
	TA5	Finding information on the Internet (e.g., using search engines and web surfing).
Social influence	SI1	My instructors/lecturers think that I should participate in online learning.
	SI2	Other students/group members think that I should engage in online learning.
	SI3	My parents feel that I should have lessons via online learning.
	SI4	People whose opinions I value feel that I should engage in online learning by using online platforms like Zoom, Google Meet, and Webex.
	SI5	My university would support/encourage the use of online learning.
Institutional support	IS1	I have no difficulty accessing the online learning system (learning management system) of my university.
	IS2	There is strong Wi-Fi and Internet connection at the campus/student hostels.
	IS3	Lecturers consider students' accessibility to the Internet/Wi-Fi when deciding on the deadline/extension given for assignment submission.
	IS4	The chain of communication is suitable for me to get access to the learning management system of my university.
	IS5	I can easily use the chain of communication that gives me access to online learning tools.
Learner readiness	LR1	I am ready to commit my time in online learning.
	LR2	I am ready to be disciplined in my online learning.
	LR3	I have shown more interest and motivation in online learning.
	LR4	I have gained helpful online learning experience during the COVID-19 period (using online platforms such as Zoom, Google Meet, Webex, etc.).
	LR5	Now that I have gone through full online learning during the COVID-19 period, I feel more confident in using online learning even if no one is around to help.
	LR6	I am more convinced that online learning is useful and important for me.
	LR7	In fact, I find online learning enjoyable and pleasant now.
	LR8	I have improved my online skills by having to do assignments and learning online.
	LR9	I feel that engaging in online learning during the COVID-19 period has simulated/enhanced my creativity and imagination.

Note: Questions in this questionnaire refer to your online learning experience in general that is, for all courses that you have taken in Semester 1, 2020/2021 (when Movement Control Order was implemented by the government). Please rate the following statements on the following scale: 1= Strongly disagree; 2 = Disagree; 3 = Neutral; 4 =Agree; 5 = Strongly agree

Quantitative Data Collection

The participants were asked to indicate to what extent they agreed or disagreed with the given statements by ticking the right option (1=strongly disagree; 2= disagree; 3=neutral; 4=agree; 5=strongly agree). Table 1 presents the items for each of the four dimensions. The answers provided by each student participant was then collected and recorded as raw data in the Statistical Package for the Social Sciences (SPSS) program.

Quantitative Data Analysis

Using the SPPS software version 27, the researchers' analysis initially focused on processing the frequencies, means, and standard deviations of the data provided by the participants. A correlational analysis was subsequently conducted on the interrelationships between the three independent variables of interest (i.e., technology accessibility, institutional support and social influence) and the dependent variable. Pearson correlation analysis was chosen to measure

the association between the variables of interest while the effects of covariance were taken into account. This data analysis procedure was employed not only to identify the presence or absence of correlation between two variables, but also to establish the precise degrees to which the variables were associated with each other. The coefficients could also provide the directions of the correlations, and determine whether the relationship between each pair of variables was positive or negative.

Qualitative Research Procedures

With respect to the qualitative component of this investigation, in-depth interviews were conducted to obtain further insight into the university students' experience in online learning during the MCO period. Similar to Khan and Khan's (2019) study, this inquiry built on the social constructivist epistemology; for example, students attending the online classes might have different experiences due to differing prior experiences, levels of understanding and socio-economic positions (Khan & Khan, 2019). It was believed that students' backgrounds and experiences could influence their motivation to study and expectations of desired outputs (Albrecht & Karabenick, 2018).

Participants in Interview Sessions

Regarding the qualitative component of this study, separate in-depth interview sessions were conducted with 41 students, who were selected using a purposive sampling technique. The inclusion criteria used to purposively select the interview participants are given as follows:

(1) Current undergraduate students at a local public university in Malaysia (as they had engaged in fully online learning for one semester or 14 weeks before this study commenced;

(2) Aged 21 - 22 years and not in their first year of study (so that they had at least some online learning experience on the campus using the university management system prior to the unprecedented pandemic);

(3) Earned at least an upper Band 3 in their Malaysian University English Test (MUET) results given that English was used in the questionnaire and interview.

Instrument for Eliciting Qualitative Data

Eleven open-ended questions were used in the interview session to explore the participants' feedback regarding their online learning experience during the MCO period, concerns and suggestions (see Aguilera-Hermida, 2020). These questions were formulated based on the core constructs included in the proposed framework of the present study, namely technology accessibility, institutional support, social influence, perceived ease of use, perceived usefulness, and learner's readiness. In order to elicit in-depth perspectives on online learning, they were followed up with probing questions prompted by the content of the dialogues.

Qualitative Data Collection

Prior to the interview session, the interviewees chose a time slot for the interview via Google Meet. On the interview day, a Google Meet link was sent by the primary researcher to the participants via a WhatsApp group to invite them to attend the online interviews. The interviews were carried out during the second semester of the 2019-2020 academic session in mid-August, 2020. Each student interviewee was interviewed in English for about 20-30 minutes. The first interview was considered a pilot session due to the structured nature of the interview, and the data obtained from the pilot session was eventually included in the analysis in view of the completeness of the answers elicited. The interviews were recorded via Google Meet with the participants' consent, and verbatim transcriptions were subsequently carried out by the principal researcher. While the study was not of a sensitive nature, efforts were made to maintain the privacy and confidentiality of the participants. To address ethical concerns, the respondents' names were not used during the process of collecting and reporting all the data in this study.

Qualitative Data Analysis

At the end of every interview, data was analyzed using a thematic analysis. This means that the data was closely examined to identify common themes - topics and ideas that emerged repeatedly. The common themes were coded and referred to as (i) technology accessibility, (ii) institutional support, and (iii) social influence. Views relating to perceived ease of use and perceived usefulness, whenever relevant, were included in the discussion. In other words, the present study focused on exploring the learners' interview responses in the light of the three factors. The 11 questions included in the interview are presented in the Appendix of this paper.

RESULTS

The quantitative results of this study are first reported before the qualitative findings are presented in the subsections.

Factors Influencing University Students' Readiness in Learning Online: Findings from Quantitative Data

Our quantitative research using the Pearson correlation analysis was executed to examine the effect of technology accessibility, institutional support, and social influence on university students' readiness to learn online. Prior to

that, the internal reliability of these constructs was measured through Cronbach's alpha. Nunnally (1978) noted that Cronbach's alpha was satisfactory when its coefficients were larger than 0.700. Table 2 shows the Cronbach's alpha values for these factors are between 0.723 and 0.933.

Accordingly, all measurement items are confirmed to have high internal consistency. In Pearson correlation analysis, a correlation coefficient (r) value of −1 is a negative correlation and +1 is a positive correlation (Lind *et al.*, 2010). The correlation coefficients between the factors in this study are below 0.700 (ranging between 0.287 and 0.508), thus signifying a reasonable discriminant validity.

Given the validity, attention can now be directed to the three hypotheses formulated in this inquiry. With respect to each of these hypotheses, quantitative results relating to each hypothesis will first be reported before qualitative findings are presented to "triangulate different data sources" while "examining evidence from the sources and using it to build a coherent justification for themes" (Creswell & Creswell, 2018, p. 274). The first hypothesis, H1, postulates that technology accessibility has a significant effect on university students' readiness to learn online. Pearson correlation coefficients show that the relationship is significant and positive as r=0.413 at p<0.01, thus supporting H1. In the ensuing hypothesis, H2, it is posited that institutional support has a significant association with university students' online learning readiness. The correlation coefficient of these linkage is 0.468 with p<0.01, thereby indicating the support for H2. Furthermore, H3 postulates that social influence has a significant effect on university students' readiness to learn online. The coefficient of this correlation is 0.409 with p<0.01, thus supporting H3. Overall, of the three correlations, university students' readiness to learn online is heavily influenced by institutional support, followed by technology accessibility and social influence.

Factors Influencing University Students' Readiness in Learning Online: Findings from Qualitative Data

Qualitative research was conducted using an in-depth interview session among 41 university students who were selected using a purposive sampling method with the aim of exploring their experience in online learning. The results of the in-depth interview session are elaborated below.

Technology Accessibility

Students' views on technology accessibility are reflected in their statements as shown in Table 3. In relation to technology accessibility, university students expressed that one of the challenges they faced in forced online learning in the pandemic situation mainly stemmed from (i) low level of technology accessibility, and (ii) poor Internet access.

Such situations have caused students to feel anxious and stressed especially when they had to take their assessments online. Further, students perceived that having a good Internet connection was vital given that not all students had adequate access to the Internet, Wi-Fi, or proper digital devices, and as such, those who were less fortunate might lose out on learning opportunities.

Institutional Support

The university students reported that they needed support from both the university and their lecturers. They pointed out that they needed the university to (i) provide better internet connectivity, (ii) fund free mobile data for online learning, (iii) build good IT infrastructure, and (iv) train lecturers in digital literacy (see Table 4).

Students also reported that they needed lecturers who could explain online lessons with greater effort, provide solutions to students who had to do practical work in their courses (e.g., crop cultivation, on-site research and lab work), give out less online assignments, and conduct online platforms competently. Students further elaborated that they needed the university to provide a better internet connectivity and to fund free mobile data to facilitate their online learning.

Social Influence

The qualitative findings on the views and perceptions given by the student interviewees, as illustrated in Table 5, further substantiate our result on the positive correlation between social influence and online learning readiness.

Table 2

Descriptive Statistics, Reliability Analysis and Correlation Analysis

Variable	Technology accessibility	Social influence	Institutional support	Learner readiness	Mean	Standard deviation	Cronbach' alpha
Technology accessibility	1.000				3.649	0.642	0.723
Social influence	0.287**	1.000			3.852	0.696	0.890
Institutional support	0.508**	0.301**	1.000		3.589	0.669	0.762
Learner readiness	0.413**	0.409**	0.468**	1.000	3.795	0.721	0.933

Note. ** Correlation is significant at the 0.01 level

Table 3

Students' Views on Technology Accessibility in Forced Online Learning

Student No.	Student Views	Labels
S26	"One of the major challenges that I encountered was technical difficulties which include poor internet connection..."	Bad internet access/low level of technology accessibility
S8	"...sometimes when lecturer make(s) an online class, I cannot get the knowledge clearly because of slow data connection."	Bad internet access
S17	"... I find it hard to focus during lectures and on some days I don't have Internet connection at all. That made it hard for me to complete some assignments that requires extra reading materials."	Bad internet access/low level of technology accessibility
S5	"One of the challenges that I face during the online classes was...the instability of Internet services ...The Internet unstable issues have resulted in students...not (being) able to listen to the lecturer properly..."	Bad internet access
S35	"...the condition of (the) Internet line is slow. I lived in a small town in Sabah that (is) having an issue of connection of data, and this makes me (it) hard (for me) to attend any online classes, and (I) missed out a lot of information from the teacher through online class, and I have to ask my friends about the information in order to complete all the tasks in a correct way."	Bad internet access/low level of technology accessibility
S22	"The main things (thing) is the unstable (instability) of the Internet connection. This is because the Internet connection of my house is sometime(s) unstable during raining. Therefore, I feel a bit worry (worried) when conducting the online tests since some online tests need good Internet connection."	Bad internet access

The social influence between lecturers and students through online platforms such as Zoom, Google Meet, and Webex enabled online teaching and learning activities to be carried out smoothly and in real-time. Besides, students were ready to continue using online learning during the post-pandemic period upon their return to the campus as long as it was conducted alongside a physical face-to-face learning environment, which mainly stemmed from their desire to be able to have an effective discussion while physically meeting and interacting with fellow students and lecturers. The interview data on students' social influence in online learning shows that their views tended to be affected by (i) interactions with people around them, namely family members, friends and lecturers, (ii) home environment, and (iii) learning environment. Table 5 indicates that some participants see the need and benefits of having face-to-face classes which they were accustomed to because face-to-face learning enhances (i) discussions with group members, (ii) interactions with lecturers, and (iii) communication with both friends and lecturers. In addition, others felt that the online learning mode was more helpful as it (i) provided comfort and flexibility of learning from home, and (ii) improved virtual communication skills to interact with friends**.** At the same time, some participants did not prefer online learning due to (i) the problem of managing both studies and household responsibilities simultaneously, and (ii) their inability to stay focused on the screen as a result of an unconducive learning environment at home. In sum, students missed their prior face-to-face classes for three reasons, which were (i) lecturers' immediate help and clarification could be obtained after the physical classes, and (ii) face-to-face classes were not interrupted by poor or no internet connection, thus indicating why the physical classroom was more conducive for learning under specific circumstances. Due to the aforementioned advantages and disadvantages of the two modes of learning, it can be noted that after the pandemic, students were likely to prefer hybrid classes, which consisted of face-to-face classes alongside online classes.

DISCUSSION

The degrees to which the three hypotheses are discussed here before the students' online behaviors need to be given due attention. Each hypothesis is discussed before summative comments are given.

Technology Accessibility and OLR

The first hypothesis is supported given that the relationship between technology accessibility and online learning readiness was positive and significant, while the perspectives and impressions expressed by the student interviewees also gave additional support for H1. Through the in-depth interviews, aside from noticing that university students generally considered it a challenge to use online learning during the MCO period, this study has ascertained that poor Internet connection remains a major hindrance experienced by students in their hometowns. The digital divide is therefore evident in the form of good and poor access to the Internet. Having a poor Internet connection during forced online classes thus seems to be one of the main contributing factors causing increased stress and anxiety among students. Consequently, students tended to miss online lessons and find the lecturers' explanations insufficiently comprehensible due to the unclear audio and/or visual transmission.

Table 4

Students' Views on Institutional Support in Forced Online Learning

Student No.	Students' Views	Labels
S32	"...Also, many of the lecturers do not know how to operate an online class properly and (this has) caused a lot time being wasted on technical issues."	Support from the university in training teachers
S40	"I was not able to follow the online learning effectively during some time, especially when my mobile data was weak because I would be out from the system automatically and I needed to enter the class again. Therefore, I would miss some important lessons brought (taught) by lecturers."	Support from the university in providing better internet connectivity
S9	"...my lecturers usually will use whiteboard to explain a theory that is complicated. So with only online classes...usually will be present(ed) through slides, I found out that it is a bit hard to understand certain theory...only through slides."	Support from the lecturers
S26	"...it is quite hard to understand what our lecturers are teaching since some of the study materials are hard to explain during online class. For example, setting environment to connecting database and PHP code, and debugging errors in the code, lecturer need to be there to check the student's code in order to help them."	Support from the lecturers
S18	"There have (used to be) exams in many subjects... have been replaced by assignment(s), so assignments will be doubled. This leads to insufficient time. The stress of students will also increase..."	Support from the lecturers
S13	"I would like the university to upgrade the Internet connection at all hostels. Having a fast Internet connection is vital for our learning since we depend on it to study, submit assignments, do online tasks, and many more."	Support from the university in providing better internet connectivity
S4	"The first thing that I would like the university to do in relation to my learning at campus is to upgrade the Wi-Fi connection. Students often use Wi-Fi to do research for assignments. It is important for students to have a strong Wi-Fi to do the assignments."	Support from the university in providing good IT infrastructure
S5	"I think the university should improve their learning website to help students easily access to it without any interruption."	Support from the university in providing good IT infrastructure
S38	"I think the university should improve our SmartV3 because there is one issue in Smartv3 where it shows "not submitted" even though we have submitted our work. This situation happened twice for our online exam and this has made students worry..."	Support from the university in providing good IT infrastructure
S26	"... I hope the university would provide students (with) financial assistance for those who (are in) need..."	Support from the university in providing financial assistance for online learning
S15	"...I also wish that the university will upgrade the SmartV3 site so for better learning experience; this is also a backup or preparation in case we will be undergoing lockdown again."	Support from the university in providing good IT infrastructure

This finding is consistent with Linjawi and Alfadda's (2018) finding that the success of the e-learning mode hinges on technological accessibility, especially in relation to the Internet speed. It also corroborates Loyd and Gressard's (1984) statement that hitches in the use of technology normally cause anxiety to users, thus resulting in barriers to e-learning. Our finding has thus highlighted the need to resolve technical issues such as unreliable Wi-Fi or poor audio quality which, according to Favale et al. (2020), can severely amplify the challenges due to obstructions and delays of OTL. In addition, students felt stressed when they were unable to submit their test answers within the stipulated time limit due to online system errors. This finding appears to be akin to those prior studies which showed that the emergence of technological issues, such as the unexpected automatic changes of their answers and difficulty in focusing on the subject matter while typing using the technology that was accessible to them (Betlej, 2013; Kuriakose & Luwes, 2016).

Institutional Support and OLR

The second hypothesis is also supported given that the relationship between institutional support and online readiness was positive and significant. More precisely, our finding that institutional support constitutes the most prominent factor affecting university students' readiness to learn online supports Linjawi and Alfadda's (2018) finding that the institutional support was important by all participants at all levels in their study. This is also consistent with Lim's (2022) finding that institutional support constitutes an important factor influencing online learning readiness, especially during an emergency remote learning situation, such as the pandem-

Table 5

Students' Views on Social Influence in Forced Online Learning

Student No	Students' Views	Labels
S41	"...during this COVID-19 period, the challenges that I have faced is on managing my time in between the online learning classes and spending time with my family. This is because I had to manage my time for the study purpose and for the house chores that I am doing which could help my mother when I am at home."	Online classes make it harder to manage both studies and household responsibilities simultaneously (home environment)
S21	"The major limitation I faced is the increased household obligations...It gives me the advantage of having extra more time to do my own works (work) while learning in the university."	Online classes make it harder to manage both studies and household responsibilities simultaneously (home environment)
S15	"As classes conducted via online, the major challenge is to manage my time. This is due to my responsibility at home. Since my mom is working, I have to do all the housework..."	Online classes make it harder to manage both studies and household responsibilities simultaneously (home environment)
S6	"I find myself not giving my full concentration during online learning. I always (get) distracted when listening to online lectures because no one sees me playing with my phone or going out from my room, so I find myself not being able to fully understand what my lecturers are teaching from the screen."	Online classes make it difficult to stay focused on screens when learning from an unconducive learning environment
S30	"...I seldom have negative emotions like I used to have back in campus, as I am surrounded by (my) family. Good emotions lead to better stress tolerance as well. Online learning allowed me to work or complete my online assessments on (at) my own pace, which I'm always keen on..."	Online learning provides comfort and flexibility of learning from home with supportive family members around
S19	"I learned how to hold meetings more effectively online...there is no exam, and all the time is spent on assignments, so the (my) use of computer programs has also improved."	Online learning improves virtual communication skills to interact with group members (friends)
S3	"I think the COVID-19 period has actually benefited me by helping me to realize the goodness of face-to-face learning in (a) certain way, and I will be much appreciated (will appreciate) the opportunity to have face-to-face discussion with my group mates after this..."	Face-to-face learning enhances classroom discussions with group members (friends)
S4	"Yes, I do miss face-to-face classroom learning because if I don't understand, can ask (pose questions) directly to (the) lecturer, and the lecture is going (can go) smoothly without being stuck, like (having) no Internet connection when (there is an) online class."	Face-to-face learning facilitates interactions with lecturers
S10	"I definitely miss physical class in (on) campus because it is more interactive and I am more focused there."	Face-to-face learning facilitates interactions with lecturers and helps stayed focus in class
S34	...Furthermore, I find (found) it harder to focus (in an online class) because I felt like I was not in the 'zone'. I am in my room and my brain just says "this is a resting place, and not (a) working place", so it is hard to set my mind gear (get my mind into gear)."	Online classes make it difficult to stay focused on screens due to an unconducive learning environment at home
S24	"I would like to do completely face-to-face classes. It is easier to talk, easier to discuss, (and there is) no connection problem. Being at (on) campus is very comfortable and there will be no distraction and other responsibilities."	Face-to-face learning enhances classroom discussions with others (friends and lecturers)
S11	"I would prefer completely face-to-face (sessions) because I can hear lecture(s) clearly, and directly ask the (my) question, and answer the question from (the) lecturer."	Face-to-face learning facilitates interactions with lecturers
S38	"Of course, if COVID-19 wasn't a limiting factor, completely the face-to-face learning method is definitely better for me as I am a more sociable person. I would prefer an environment where I can chat with my friends and lecturers directly and not in front of a screen...I definitely not preferring (don't prefer) fully online learning as it was a pain (in) the ass for me as I sometimes do not actually have (a) stable Internet connection to deal with my learning. It is also really hard for me to get in touch with the (my) friends when encountering problems in studies."	Face-to-face learning enhances communication with both friends and lecturers

ic situation in this inquiry. Notably, our qualitative findings suggest that students generally prefer online learning to face-to-face learning if their roles are not restricted to being mere listeners during Internet-based lessons. By and large, they expect the institution to minimise static e-learning content that can generate very little discussion. Our finding is therefore in line with Bowen's (2012) observation that discussion constitutes an ideal way to challenge open minds although technology contributes to much content. Such a fundamental principle for conducting online sessions is particularly needed in cases where practical lab work and hands-on activities are not possible. Our findings therefore suggests that teachers' support constitutes a form of institutional backing that enhances forced online learning during the MCO period. This is consistent with Scherer *et al.*'s assertion (2021) that "online teacher presence emphasises teachers' responsibilities for their design, organization, facilitation and instruction in the online learning space so that educational purposes can be fulfilled while learners and teachers are not co-located or working at the same time" (p. 2).

Social Influence and OLR

The third hypothesis is also supported in that social influence has been found to have a significantly positive effect on university students' readiness to learn online. The result concurs with prior studies which showed that students' learning hinges on human interaction in all aspects of their lives (Allen & Seaman, 2003; Saafin, 2008). More precisely, our finding is consistent with previous research findings which showed that social influence could be a primary external factor impacting students in forced online learning (Al-Ammary et al., 2014; Elkaseh et al., 2015; Farahat, 2012; Salloum, 2018). In addition, our qualitative results showed that although students appreciated some social connections which had been made available to them via the real-time online platforms, they generally exhibited a stronger preference for physical face-to-face interactions with their instructors and fellow course-mates. It means that despite the possibility of establishing some social relationships via online learning, instructors cannot afford to be complacent with the mere availability of online platforms at their disposal. To be exact, one of the roles that instructors can effectively play is to ascertain whether their students have encountered problems in managing their studies and household responsibilities at the same time. This is particularly needed in cases where a sizeable portion of the students being guided online are unable to stay focused on the screen due to family distractions and household responsibilities. Our result therefore corroborates Buzzetto-More's (2003) finding that online learning should suit students' learning styles and existing abilities under the circumstances concerned (Buzzetto-More, 2013), and condition-dependent learning is especially needed when students encounter problems in an unconducive learning environment at home setting. It also concurs with previous researchers' (Azlan et al., 2020; Cao et al., 2020; Odriozola-Gonz´alez et al., 2020) view that instructors need to closely monitor students' online learning readiness, particularly by showing sufficient empathy towards their students.

Overview of Factors Influencing OLR

Overall, the aforementioned findings have revealed that students' readiness to engage in forced online learning in the pandemic situation is influenced by institutional support, technology accessibility, and social influence; however, among these three factors, institutional support stands out as the factor demonstrating the most significant association with online learning readiness. Viewing these factors at a deeper level, we need to acknowledge here that institutional support has a relatively high correlation with technology accessibility, thus providing additional support for Lee and Jung's (2021) finding that technology accessibility is greatly related to the fidelity of institutional support. A possible explanation is that when institutions provide students with relevant support in a pandemic situation, students generally receive an impetus to adopt a new technology, thus showing a greater propensity to use the technology concerned. In addition, although it has been found that social influence is correlated to online learning readiness, the interrelationship was still not as strong as the correlation between online learning readiness and institutional support or technology accessibility. Our finding is consistent with Linjawi and Alfadda's (2018) finding that the influence of social influence on online learning was acceptable but not too high for all participants in their investigation. In sum, by understanding online learning readiness among university students and the ways in which these three external factors affect online learning readiness, lecturers and institutions will be in a better position to come up with the right online learning teaching approach to help students enhance their online experience and elevate their learning satisfaction.

In brief, students need to receive sufficient institutional support in the form of cost reduction and system upgrading, given that good IT infrastructure in the university learning management system could enable students to engage in an effective learning process which, in turn, could provide greater external motivation in forced online learning. Additionally, institutions should provide training to lecturers in order to help them adapt online teaching in a pandemic situation. The pandemic caused a shift to OTL that required lecturers to adapt their OTL within a short period, whether or not they were prepared for the OTL. While lecturers' unreadiness to conduct online classes could cause students to experience more stress in forced online learning, their adaptation to conduct lessons online using the available technology played an important role in enhancing the effectiveness of OTL. By and large, our findings suggest that the online learning experience during the MCO period has helped students to appreciate their face-to-face learning on campus as they missed interacting with their course-mates in a phys-

ical classroom. It has to be acknowledged that only some students tended to experience intense stress while engaging in fully online learning due to the need to demonstrate a higher degree of self-reliance and the need to reduce distraction from their family members. Nevertheless, by and large, most students live with their family members while learning online from home during the pandemic, thus making the forced online learning circumstances less stressful. Due to the aforementioned advantages and disadvantages of the two modes of learning, after the pandemic, students were likely to prefer hybrid classes, which were face-to-face classes alongside online classes.

Theoretical and Managerial Perspectives

The findings need to be discussed from some important theoretical and managerial perspectives. Theoretically, based on the guiding principles in Salloum's (2018) model, a new model has been developed through the adaptation of TAM (Davis, 1989), taking into account three major external factors, which are institutional support, technology accessibility and social influence. This new model and the empirical results obtained in this mixed methods study have contributed to advancing the extant body of knowledge about forced online learning readiness in a pandemic situation affecting a developing nation. Additionally, the managerial implications of the current research are two-fold. Firstly, university administration should facilitate the transition to an online learning mode by providing strong internet connectivity and internet/Wi-Fi package subsidies to students. This means that the university can have a 24-hour computer lab (computer resource room) with Wi-Fi access, given that providing computer lab facilities can make technology more accessible to students, thus enhancing student motivation to learn online. Secondly, as the pandemic had made it inevitable for institutions worldwide to shift to forced online learning and teaching within a short period irrespective of whether lecturers were prepared or not, the authorities had to place greater emphasis on training in the use of technology for both students and lecturers. This was done to convert more conventional academic assignments and examinations to online ones, and to prepare for a possible re-emergence of a forced online learning situation in the future. Nevertheless, the workload involving online assignments should be optimized to an appropriate level in order to (i) avoid a cognitive overload, and (ii) ensure that students do not get bogged down by excessive online assignments, thus mitigating excessive online stress and demotivation. To boost social influence in learning, students' online lessons need to be made more interactive and discussion-generative by having synchronous online classes instead of only asynchronous lessons, as the former gives more opportunities for teachers to interact with students alongside providing emotional and social support. During a synchronous online class, both the instructor's and learners' videos need to be turned on as the video can potentially be a powerful tool that provides a multi-sensory learning environment aimed at focusing learners' attention on the information delivered (Ahmad *et al.*, 2020), and this is consistent with Azlan *et al*.'s (2020) finding that the effectiveness of this mode mainly hinges on the quality of the Internet connection and WiFi accessibility.

CONCLUSION

Using the mixed methods research design, this study has explored university students' experience and readiness to engage themselves in forced online learning that resulted from a pandemic situation. Students' responses based on the questionnaire and interview data have shown that three factors, namely technology accessibility, institutional support and social influence, have affected their online learning to various degrees. Both our quantitative and qualitative data has shown that the challenges of forced online learning were mainly attributable to poor Internet access and a low level of technology accessibility. Our quantitative data has also shown that institutional support strongly affected university students' OLR, followed by technology accessibility and social influence. Our qualitative data has further indicated that the major challenges encountered by the students in a forced online learning situation were the lack of physical interaction with the lecturer, delayed response time, absence of traditional classroom communication and conducive learning environment as well as conflicting demands of studies and household responsibilities. The respondents' views were closely connected with their home setting, learning environment and interactions with individuals around them. In addition, they needed support from the university, particularly in the (i) provision of better internet connectivity, (ii) funding of free mobile data for online learning, (iii) establishment of decent IT infrastructure, and (iv) training of lecturers in digital literacy. Overall, as the pandemic clearly sped up the adoption of online learning resources, it is understandable that forced online learning in the post-pandemic stage will continue to be needed, and as such, it is important to have a paradigm shift towards viewing online learning as a key national priority while designing and implementing new courses.

Despite the findings reported above, it needs to be acknowledged that this study has three limitations. Firstly, the sample of the present study was limited to participants from one university. The participants, however, have provided a wealth of information on the correlations between the OLR and the three factors, thus enlightening us on the major aspects deserving attention if the size of the sample is enlarged in future research to increase the generalizability of our findings. Secondly, the sample used in this inquiry was limited in scope as it focused exclusively on students instead of both students and instructors. To obtain more comprehensive findings, future research can involve a longitudinal survey aimed at discovering possible changes of participants' perceptions over a longer period of forced on-

line learning. Thirdly, this study was limited to a local setting, thus providing no information on how these factors can influence OLR in diverse national or geo-political settings. Nevertheless, the related results on the varying degrees of the factors affecting online learning readiness have provided authentic information on the basic computing facilities, institutional backing and peer interactions that merit attention if a comparative study is conducted in future to include participants from higher institutions across different developing countries in Asia. To sum up, the aforementioned limitations do not compromise the obtained results because the students' responses can be used to help us grasp the degrees to which OLR is affected by the three major factors. This study can be further extended by adopting a broader range of analytical procedures, which may move beyond a correlational analysis and a thematic analysis based on a questionnaire. Overall, this study has managed to elicit genuine learners' responses via a standardized questionnaire, even though future researchers can extend this study by including a wider range of analytical procedures. Attention can also be specifically devoted to how students use social media to express their views and/or perceptions about how their online learning experience is affected by technology accessibility, institutional support, and broader influence from their instructors, peers and the society at large.

DECLARATION OF COMPETITING INTEREST

None declared.

AUTHORS' CONTRIBUTION

Loi Chek Kim: conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; writing - original draft; review and editing.

Jason Miin-Hwa Lim: formal analysis; investigation; methodology; resources; validation; writing – review and editing (all sections).

Norazah Mohd Suki: formal analysis; investigation; resources; validation; review and editing (literature review and discussion sections).

Hock-Ann Lee: formal analysis; investigation; methodology; validation; review and editing (methodology section).

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APPENDIX 1

Interview questions

Please type out your answers.

Please provide detailed answers to the following questions:

Technology accessibility

1. During the COVID 19 period, classes were conducted online. Can you share some of the major challenges/limitations/advantages that you faced in relation to your online learning during this period?

2. Were you given online assessments/assignments/projects/tests during the MCO period? Can you give some examples of the online tasks given to you? How well have you performed in the online tasks, based on your best judgment? Why do you say so?

3. During the COVID-19 pandemic, do you think that the MCO period has actually helped you to improve your ICT skills to access online information and virtual meeting platforms? Can you elaborate your answer?

4. During the COVID-19 pandemic, do you think that the MCO period has actually made you feel helpless at times due to some problems relating to online learning? If yes, what were the problems you encountered?

Social Influence

1. During the COVID-19 period when you were required to have a new normal of learning from home (online learning), did you miss your prior face-to-face classroom learning? Why?

2. Would you prefer to stick to the fully online learning when you are back to the campus or when you are in a position to do so (for example, when the COVID-19 situation improves/ends)? Why? How do you feel about going back to the campus again? What are your needs and concerns?

3. During the COVID-19 situation, you might have missed your friends in the campus. However, do you think that engaging in fully online learning during the COVID 19-period has actually helped you to learn better/more effectively from a home environment? Why?

Institutional support

1. During the COVID-19 pandemic, do you think that the MCO period has actually benefited you to a certain extent in relation to your learning and assessment experience? Why?

2. Do you need any support from your institution in relation to online learning (during the MCO period)? If yes, what kind of support do you need?

3. When you return to the campus for the new semester or when you are in a position to do so (for example, when the COVID-19 situation improves/ends), what would be the first thing that you would like the university to do in relation to your learning at campus? Why?

4. What is your most preferred type of learning environment (fully online, blended learning/hybrid or face-to-face)? Why?