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ONLINE LEARNING MOTIVATION DURING COVID-19 PANDEMIC: THE ROLE OF LEARNING ENVIRONMENT, STUDENT SELF-EFFICACY AND LEARNER-INSTRUCTOR INTERACTION

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ABSTRACT

Purpose - Due to the COVID-19 pandemic, the Malaysian government declared a Movement Control Order (MCO) to prevent the spread of the virus. Educational institutions were forced to switch their pedagogy to online learning to complete the semester curriculum, catching academicians and students off-guard that resulted in makeshift online lesson delivery. Previous online learning motivation studies have neglected the impact of an unplanned or sudden transition to online learning during a pandemic on student motivation to learn. This study aims to examine location learning environment, learner-instructor interactions, and self-efficacy of students more succinctly on their learning motivation during an unplanned transition to online learning.

Method - This study used a sequential explanatory mixed method strategy with a sample size of 535 randomly collected from a public and two private higher education institutions in Malaysia. IBM SPSS statistical software v22 was used for descriptive statistics. Regression testing was carried out using AMOS statistical software v21 structural equation modeling.

Findings - Revealed the importance of location learning environment in fostering student motivation and the positive influence of learner-instructor interactions on students achieving the desired learning outcomes during an unplanned transition to online learning. However, there is no evidence to suggest a causal effect between student self-efficacy and online learning motivation during such conditions. The theoretical implication indicates that having conducive hygiene factors are essential to driving student motivation under such situations.

Significance - The COVID-19 pandemic provides opportunities for researchers to examine the role of various motivational theories to explain student motivation in learning under challenging conditions. Educators and students would benefit on ways to increase student online learning motivation in lockdown conditions. Setting up a more efficient online delivery approach could lead to higher student satisfaction and potential enrolment.

Keywords: COVID-19 pandemic, online learning motivation, location learning environment, student self-efficacy, learner-instructor motivation.

INTRODUCTION

As the world grapples with an upended global socio-economy brought about by the COVID-19 pandemic, that has resulted in thousands of fatalities, it is also changing the way people interact and communicate (Al-Kumaim et al., 2021). A global survey that was carried out by McKinsey (2020) postulated that the COVID-19 crisis has accelerated the adoption of digitization of people interactions by several years. This is a result of countries taking drastic measures enforcing social distancing among its citizens and implementing restricted movement control to protect and safeguard public health that brought the global economy almost to a standstill. Large community events

such as concerts, sports events and conferences were cancelled; manufacturing plants, office and production house workers were forced to work from home, and places of mass gathering such as places of worship, malls, wet markets, and schools were forced to close to reduce person-to-person contact and human density within confined areas. These actions also led to the closure of thousands of educational institutions worldwide impacting over 90 percent of the world's student population (UNESCO, 2020).

In order to complete the unfinished semester curriculum and subject syllabus, educational institutions were compelled to adopt remote learning as an alternative means of delivering lessons to students. However, the sudden transition has caught many students, instructors, and administrators of educational institutions off-guard. Lessons requiring the use of laboratories and physical site activities such as engineering works and business experiential learning could not switch to online and were forced to cancel (Ainaa, 2020). Other issues include technology technicalities such as unsuitable personal computing devices and poor internet network connections (Lee, 2020), lack of instructor-student interactions between instructors and students and students' lack of ability in using online platforms (Narayanan & Selvanathan, 2017).

In the Malaysian higher education context, students face two main challenges of staying focused and motivated as they switch from face-to-face learning to online learning. While some are coping well with online learning, others are finding it difficult—struggling with online support, technicalities, solitude, and isolation (Sani, 2020). Compounding this problem are students taking online learning pedagogy for the first time who lack the necessary preparedness such as devices and internet facilities (Sani, 2020). It highlights three main areas of concern. First is a lack of internal desire or the student's belief in his or her own capability that leads to a feeling of loneliness and isolation. Second is the importance of lecturer support in communicating and guiding students during the abrupt change. This support would help to make the transition less painful. Third is the criticality of location environment including the condition of the location where learning takes place.

Whilst some studies have shown positive effects of online learning such as cost-effectiveness and access to world class education (De la

Varre et al., 2011; Lorenzetti, 2013), other studies such as Protopsaltis and Baum (2019) postulated online education as unfavorable as it has not lived up to its potential in its contribution and failed to reduce costs and improve student outcomes. Gregory and Kaufeldt (2015) expounded that diminished student engagement and motivation are attributed to the infusion of technology into students' lives, leading to chronic stress, and living in impoverished conditions. They further attributed that instructional mediocrity, social isolation, and fixed mindsets are the reasons behind the apathy towards online education among students.

Whilst previous studies (Ludtke et al., 2009; Frenzel et al., 2007) on student motivation were based on planned pedagogical contexts and learner settings that were executed in accordance with the requirements of program curriculum and syllabus activities, it would be interesting to find out whether the same outcome would apply in a sudden unplanned change due to the COVID-19 pandemic. For instance, would students be able to cope with an abrupt change in pedagogy and at the same time submit themselves to visual and auditory distractions at home? Those who are lucky enough, have an area within their home which is cozy and quiet, making it an ideal place to focus on their studies. However, there are many students who cannot afford such luxury. These students must bear with distractions emanating within their learning location such as electronic devices, people talking, or children running around the house. Under such circumstances, would they still find the motivation to participate actively in online learning? Would those having self-managed ability perform better and what level of influence does an instructor have on student motivation under such circumstances?

These three questions form the core of this study. In our attempt to find answers to these questions, this study leveraged on three contributing factors of students' lack of motivation as posited by Gregory and Kaufeldt (2015) that form the objectives of the study. Understanding these factors could also address some of the concerns of students staying focused and motivated during online learning in the context higher education institutions (HEIs) in Malaysia. The first is an examination of the quality of learner-instructor interactions in terms of the support and encouragement received by the former (Shen et al., 2013). The second is students' ability to adjust in a socially isolated environment of an enforced homebound situation and being away from regular physical social interactions (Peechapol et al., 2018). The

third objective dwells on the element of a fixed mindset that applies to the inability of students managing their online study (Bandura, 1986).

With the anticipation that online learning will eventually be fully integrated into HEI programs, post pandemic, this study intends to understand the factors especially the home or more succinctly, the location learning environment and their impact on students' learning motivation. The restricted movement control order provides the ideal opportunity to examine the effect of a functional online learning environment on student motivation in a homebound situation.

LITERATURE REVIEW

Several terms are used to describe the use of digital technology in online learning, among them are e-learning, distance learning, flexible learning, open learning, blended learning, mixed learning, and MOOCs (Massive Open Online Courses). Whilst the terms 'online learning' and 'e-learning' are used interchangeably, Hartnett (2016) opined that online learning is a form of distance education mediated by technological tools that enable students who are geographically separated from instructors and educational institutions to continue their education. Online learning, unlike the traditional face-to-face classroom learning, is utilizing information and communications technology (ICT) in delivering teaching materials, learner-instructor interaction, collaboration and student engagement (Widjaja & Chen, 2017). The rapid evolution of the Internet, big data, artificial intelligence are some of the emerging technologies that have dramatically changed the learning environment, creating new learning-teaching environments in the virtual world. Such changes enable learners to determine their time, location, and pace of learning. With the support of new technology, learning has become more open and flexible which in turn enhances learners' learning experience.

It is interesting to note that the culture of online learning has not been nurtured among students of HEIs in Malaysia. Even tertiary education students often require hand-holding and depend largely on their instructors to teach and guide them even though they are given the preferred choice of independent study. It would be interesting to understand the motivation of these students in an enforced online learning environment and their ability to be more independent and self-efficacious.

Online Learning Motivation

Several studies (Chen & Jang, 2010; Hartnett, 2016; Widjaja & Chen, 2017) have suggested that motivation is an important outcome in the online learning environment. In this regard, Martens, Gulikers and Bastiaens (2004) argued that online learners are invariably more intrinsically motivated as the learning environment typically relies on intrinsic motivation associated with learners' curiosity and self-regulation to engage in learning. One of the human motivations is having a sense of belongingness (Maslow, 1943). However, the online learning environment often isolates learners from their peers, generating a sense of loneliness and lack of face-to-face interactions that are present in the physical classroom setting (Kotera et al., 2021). Other reasons include time conflict with other commitments (Croft et al., 2015) and distress with technology (Hara & Kling, 2003). Invariably, these online learning manifested problems result in higher dropout rates (Varrea et al., 2014). Given the sudden unplanned change in pedagogy, this study strives to understand student motivation and their ability to cope under such situations.

Location Learning Environment

In this regard, learning environment refers to the surroundings of the physical environment where learning takes place. Studies by Robert et al. (2012) have shown that students' perception of the learning environment has a significant correlation with their learning satisfaction. These perceptions form the feel-good factors that include leaners' feelings of well-being and security that is generally summed up as contentment to fulfill learners' physiological and safety needs (Maslow, 1943). This basic need is imperative in motivating students to learn. However, the location learning environment is a general term that is not only confined to parental support (Gniewosz & Eccles, 2013), but also applies to an environment that has stimulating support materials such as books (Biedinger, 2011).

A study location need not have to be at home or school as online learning provides flexibility for learning to take place anytime and anywhere as long as the learner has internet network connection and personal computing device (Lynch, 1999). Love (2017) and Zureick et al. (2018) postulated that regardless of locations, distractions would have a negative impact on learning outcome whether the learner is attending class in person or participating in learning online. It is a

misconception to perceive that students born in the era of Gen Z are used to electronic gadgets, and therefore, are less likely to be affected by visual and auditory distractions. Students who multitask while learning online are found to have poor judgement and therefore have less positive learning outcomes (Blasiman et al., 2018).

Based on these definitions of learning environment, this paper conceptualizes the local learning environment as diverse physical locations, contexts and cultures in which students learn. Since students learn in a wide variety of settings, such as outside-of-school locations and outdoor environments, the term refers to preferred alternatives to the classroom, which has traditional and limited connotations.

Learner-Instructor Interaction

Learner-instructor interaction refers to exchanges between learners and instructors characterized by attempts to motivate and guide learners (Hartnett, 2016). These interactions provide a mechanism for feedback allowing for clarification of misunderstandings. Thach and Murphy (1995) identified seven types of learner-instructor interactions in distance education settings: i) establishing learning outcomes/objectives; ii) providing timely, useful feedback; iii) facilitating information presentation; iv) monitoring and evaluating students' progress; v) facilitating learning activities; vi) facilitating discussions; and vii) determining learning needs and preferences. In a similar vein, Garrison et al. (2000) introduced the concept of teaching presence as part of the community of inquiry model. Teaching presence explicates the teaching role in online environments which encompasses design and organization, facilitating discourse and direct instruction (Garrison, 2011).

Although studies by Alqurashi (2019) and Robert et al. (2012) have concurred on the positive impact of learner-instructor interactions in online learning, the outcomes was a result of planned transitions, and instructors were well prepared to deliver lessons. A sudden and unplanned transition to using online pedagogy could result in different outcomes on learner-instructor interactions. Similarly, instructors are also caught unprepared for the transition. The lack of pedagogical content knowledge (Ching et al., 2018), the need to create online contents (Dhawan, 2020) and technical issues associated with modern technology have all hampered the ability of instructors to effectively interact with their learners. As online teaching is no longer an option

but a necessity, this study intends to investigate the role of educators and the effectiveness of learner-instructor interaction in facilitating learners' feedback, making learners ask questions and broadening learners' horizon for the course content (Keeton, 2004).

Self-Efficacy

In addition to the impact of learner-instructor interactions on students' online learning motivation, the mindset of students plays an important part in their online learning perception. In this study, self-efficacy portrays the mindset that forms the intrinsic behavior of students motivated by their own internal desire of doing an activity for its inherent enjoyment. It is a belief that one is capable of learning or performing at a certain level in order to attain certain goals (Bandura, 1986). Unlike constructs such as self-concept, self-efficacy is focused on an individuals' belief about their performance capabilities for a certain task within a context that have yet to be undertaken.

Self-efficacy has been identified as an important predictor of successful outcomes and enhancing satisfaction in online learning environments (Kuo et al., 2013). Academic self-efficacy (Artino, 2008; Lynch & Dembo, 2004) and efficacy to learn online (Shen et al., 2013) were found to be significantly related to a number of factors including the use of high level learning strategies (Moos & Azevedo, 2009; Wang & Wu, 2008), application of critical thinking and metacognitive learning strategies (Artino & Stephens, 2006), persistence (Hart, 2012), satisfaction (Artino, 2008), participation (Kuo et al., 2013) and academic performance (Hodges, 2008). However, several studies that examined self-efficacy to learn online could not predict student achievement outcomes (Bell, 2007; Xie et al., 2006). Prior successful experience with online learning has also been found to be important for learners to feel efficacious about future learning in similar contexts (Bates & Khasawneh, 2007). Furthermore, learners self-efficacy may fluctuate as they come to understand the challenging nature of learning in technology-rich environments (Moos & Marroquin, 2010).

Research Framework and Hypothesis Formulation

Based on the literature review, a research framework was developed for this study (Figure 1). The hypotheses were formulated to address the three objectives of this research. The first hypothesis is the learning environment. Although several studies mentioned the correlation of

the learning environment on students' motivation to learn , they are diverse on its definition ranging from online learning environment (Robert et al., 2012), classroom settings (Ni, 2013), supportive home environment (Gniewosz & Eccles, 2013), social learning environment (Raspopovic et al., 2017) to distractions (folding laundry, playing a computer video game, texting on a cell phone, engaging in conversation, watching a low-arousal video, and watching a high-arousal video) in a non-classroom environment (Blasiman et al., 2018). This study combined visual and auditory distractions (Blasiman et al., 2018) with Gregory and Kaufeldt's (2015) social isolation to form the first hypothesis to understanding student online learning motivation (H1) in an unplanned and sudden circumstances. Students stranded at home often look for an alternative outlet(s) for entertainment. This entertainment in the form of social media chats, playing video games and other online activities compound the effect of visual and auditory distractions from other sources within the home environment. This research considered these distractions as location learning environment (LLE) since it gives meaning to the physical surroundings where cognitive processing and development that take place may be different each time a student participates in an online class (Lynch, 1999).

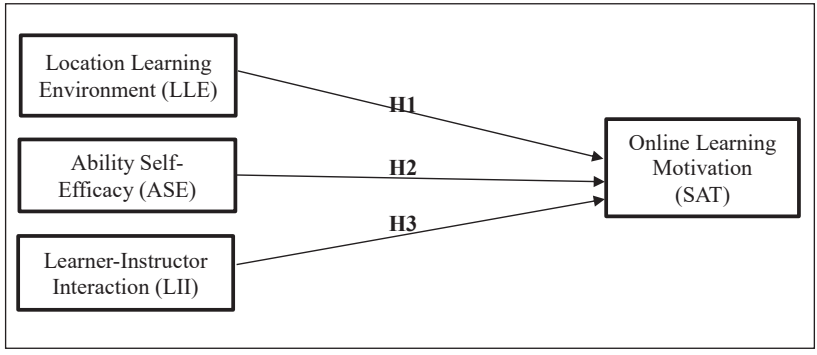
The second hypothesis was formulated based on students' mindset and their belief in their own ability to achieve goals (Bandura, 1986). Whilst Gregory and Kaufeldt (2015) postulated on the fixed versus growth mindset, other studies related self-efficacy to computer self-efficacy (Isik, 2006), multifaceted self-efficacy dimensions (completing an online course, peer-peer interactions, computer self-efficacy and learner-instructor interactions) (Shen et al., 2013), and ability self-efficacy (belief in one's own ability, predictor of academic achievement, learning and performance, excelling in socially isolated environment) (Peechapol et al., 2018). Whilst these studies have shown a consensus on the positive effect of self-efficacy on student motivation in online learning, other scholars such as Bell (2007) and Xie et al. (2006) have indicated otherwise. This research aimed to explore this phenomenon further as each of these definitions have their own merits. The objective was to understand the mindset of students impacted by distractions in the learning environment. The researchers classified this mindset as ability self-efficacy (ASE) to differentiate from other self-efficacies such as computer self-efficacy and multifaceted self-efficacy. It denotes the ability of an individual to recognize his or her own capabilities including having the self-

discipline in managing his/her own studies and completing an online course without difficulty thereby enhancing motivation to learn (H2).

The third objective was formulated based on the role of an instructor's influence on student motivation. The literature (Kuo et al., 2013; Alqurashi, 2019) are unanimous in advocating the significant contribution of learner-instructor interaction as a primary variable in online student satisfaction and persistence. It resonates with Gregory and Kaufeld's (2015) study when explaining low student motivation that repetitive lessons which lack real-life application and lessons that require low-level thinking skills often caused students to become bored and disengaged. Although their study emphasized instructor's locus of control in classroom norms, we hypothesize that the same span of control could conceivably apply in an online learning environment where an instructor can inject excitement and enthusiasm in students' learning through a myriad of activities that are both practical and meaningful to the real world (H3). These three hypotheses are illustrated within four constructs in the following research framework (Figure1).

Figure 1

Research Framework and Hypotheses



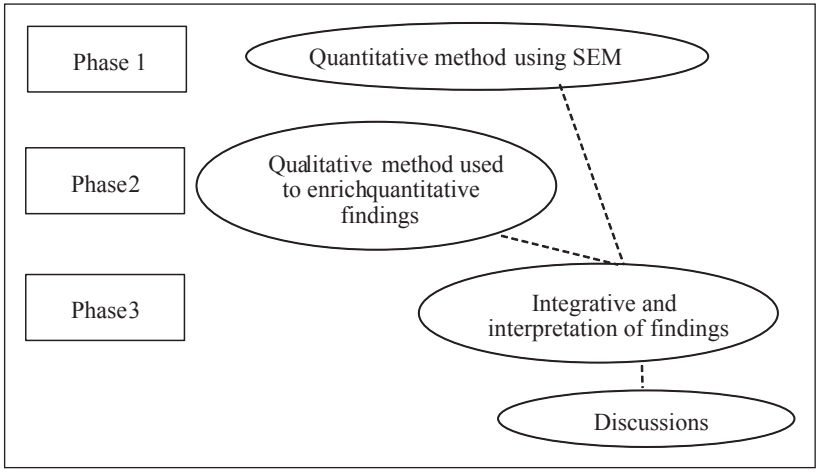
RESEARCH METHODOLOGY

This study adopted a mixed method strategy. The approach undertaken involved three phases, first collecting and analyzing quantitative data and then applying the same process for qualitative data (Creswell,

2003). Using this strategy allowed the researchers to solicit inputs from subject matter experts that could be used to substantiate research findings and explain the phenomenon succinctly (Figure 2).

Figure 2

Sequential Explanatory Mixed Method Approach (Bowen, Rose & Pilkington, 2017)



Quantitative Method

Sampling Method and Data Collection

Undergraduates from a public and two private HEIs with a combined total population of 39,907 students were selected to participate in this research. Based on a 95 percent confidence level with a 5 percent margin error and a population size of 40,000 (*N*), the recommended sample size for generalization is 384 (*n*) (Krejcie & Morgan, 1970). As the population frame is not available due to data confidentiality policy of the respective institutions, this study used the convenience sampling method. The convenience sampling method is a non-probability approach and has low sample representativeness. To minimize this problem, the targeted sample size was increased to 1,500 which was larger than the recommended sample size of 384 by Krejcie and Morgan (1970). Based on Central Limit Theorem, given a large sample size, the sampling distribution would approximate a normal distribution. The increase in targeted sample size (from the

suggested 384) was also due to the potential low response rate as highlighted by Fincham (2008) of around 25 percent to 30 percent response rate for e-mail or internet mediated surveys. Nevertheless, the actual response rate was substantially higher than expected. The high response rate could also be due to students who were confined to their homes during the MCO. Thus, increasing their availability and willingness to respond to online surveys. The number of responses achieved was 535 and this large sample size should minimize the issue of sample representativeness. Furthermore, Prasad (2020) opined that larger than sample size response obtained from non-violation of data collection ethics is beneficial as it would enable the study to accept fully completed questionnaires. A larger than sample size response also enables removal of outliers to adjust data normality without losing the statistical power of the sample size (Ramos-Vera, 2020).

Measurement Scale

The instrument for the study was made up of three sections. Section A comprised demographic variables used in understanding the profile of respondents who participated in the study. Section B consisted of sets of 5-point psychometric Likert scale statements segregated according to LLE, ASE, LII and SAT constructs as defined in the conceptual framework. These statements required respondents to specify their level of agreement in the range of: strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5). Finally, Section C comprised an interpretive comments section that allowed us to interpret elements of the study from feedback received. The instrument was made up of 16 items representing the constructs: LLE (4 items), ASE (4 items), LII (5 items) and SAT (3 items) extracted from Concordia University (2004) and adapted for the purpose of this study.

The data were analyzed using descriptive and inferential statistics via IBM SPSS statistical software version 22. Structural equation modeling AMOS statistical software v21 was used for confirmatory factor analysis and multi-regression testing of the construct hypotheses.

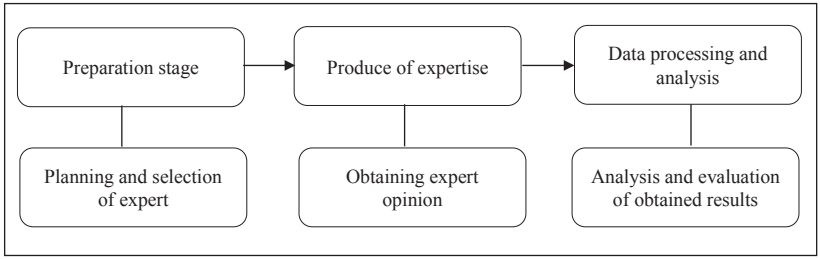
Qualitative Method

To assist in better understanding the phenomenon, a qualitative method was undertaken using a structured interview to substantiate the

quantitative findings (Leech & Onwuegbuzie, 2007). Boddy (2016) posited that a single participant who could provide highly informative and meaningful opinion would be sufficient for management or medical research using the qualitative method. In undertaking this approach, an assistant professor and neuropsychologist from the Department of Psychology and Counselling, Universiti Tunku Abdul Rahman, was interviewed. The selection of the expert was based on two primary aims with reference to the following stages of expertise (Figure 3). First, he was chosen on the principle of his field of competence (Mikecz, 2012; Nind et al., 2015; Stewart, 2001) and second, his familiarity with the latest scientific and practical developments in education and pedagogical science through his affiliation with a HEI (Iriste & Katane, 2018). Other criteria included his academic qualifications, publications, experience in academic/pedagogy work, and involvement in professional activities in his field of expertise (Iriste & Katane, 2018). The expert's heuristic ability to address and assess the research objectives from different aspects representing the expert's area of expertise, accumulated experience, and competence to provide commentaries would facilitate a better understanding of the phenomenon (Iriste & Katane, 2018).

Figure 3

Stages of Expertise



DATA ANALYSIS AND FINDINGS

Preliminary Data Analysis

Prior to the final data collection, a pilot test was performed with a sample size of 53 respondents to validate the research questionnaire and identify potential problems (Van Teijlingen & Hundley, 2002).

Results from the pilot test did not indicate major issues. In the main study, a total of 535 questionnaires were returned representing a response rate of 35.6 percent that exceeded the sample size of 384. The data collected were screened for missing data, response bias, multicollinearity and multivariate issues. Homogeneity test carried out using Levene's to observe distribution of samples collected was found to have normal variance and normality tests showed common variance distribution. Four cases deemed to have violated the outlier labelling rules were removed reducing the sample size to 531. Screening and validity tests showed no multivariate and multicollinearity issues with the sample collected.

Demographic Profile of Respondents

Descriptive statistics was conducted to gain understanding of the distribution of respondents' background information.

Table 1

Demographic Profile of Respondents

Item	Classification	Frequency	Percentage
Gender	Male	160	30.1
	Female	371	69.9
Age Group	20-25 years old	487	91.7
	Above 25 years old	44	8.2
Nationality	Malaysian	503	94.7
	Non-Malaysian	28	5.3
First time doing online lesson	Yes	207	39.0
	No	324	61.0

The results in Table 1 show that the ratio of male to female is 30.1 percent (n=160 male) to 69.9 percent (n=371 female), respectively. As this study covered undergraduate students, it was not surprising that the majority of the respondents aged between 20 and 25 represented 91.7 percent (n=487) of the total population sampled. The majority of the respondents (94.7% n=503) were Malaysian. It is interesting to note though that 39 percent (n=207) of the respondents mentioned that this was their first time doing online lesson. It implied that most Malaysian students or otherwise were location bound as the data was collected during the MCO imposed by the Malaysian government to contain the spread of COVID-19.

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was performed primarily because a few of the constructs were adapted. Using this statistical method increases the reliability of scale by identifying inappropriate items for removal, detecting structure, and determining the dimensionality of the set of variables (Netemeyer et al., 2003; Tabachnick & Fidell, 2007). Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity carried out to test for sampling adequacy (value = 0.934) and homogeneity of variances (sig. = 0.000) respectively indicated adequacy of the data for use in factor analysis. In the exploratory factor analysis, principal axis factoring (PAF) was applied with varimax rotation which yielded a five-factor solution with eigenvalues greater than 1.0. The result was confirmed using scree plot as a secondary criterion for factor verification. Two issues were uncovered from the rotated component matrix. One, an item (LII1) found to have poor factor loading (< 0.3) that could possibly cause unidimensionality and validity issues of the measures was dropped from further analysis (Comrey & Lee, 1992). One latent factor was loaded with two items (LLE1 and ASE1) from different constructs. According to Tabachnick and Fidell (2007), any factor that has less than three items may suggest an unstable factor. This factor was removed making it a four-factor model of LLE (3 items), LII (4 items), ASE (3 items) and SAT (3 items) representing the conceptual framework.

Reliability Analysis

These four factors were assessed for their set of scale reliability using Cronbach's alpha as a measurement of internal consistency. The outcome showed ASE ($\alpha = 0.841$), LLE ($\alpha = 0.763$) and SAT ($\alpha = 0.882$) factors had Cronbach's alpha values greater than 0.70 indicating a high level of consistency between each of the constructs with other constructs in the regression model (Nunnally, 1978). Although LII factor had a Cronbach's alpha value of 0.637, it is considered as acceptable internal consistency ($0.6 \leq \alpha < 0.7$) for exploratory factor analysis (Robinson et al., 1991). These four factors were used as variables for confirmatory factor analysis.

Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was carried out using structural equation modeling AMOS statistical software v21 to verify the factor

structure of these observed variables and to test how well these measured variables represented the constructs of the study.

The initial measurement model showed good value for most of the fit indices (GFI = 0.952, AGFI = 0.916, TLI = 0.948 and CFI = 0.964) except the chi square per degree of freedom ($\chi 2$ /df) at 3.774 was above the threshold of 2.0; RMSEA (value = 0.072) was just outside the threshold of 0.05, and p-value (sig. = 0.000) showed significant value. This meant that the model could not be accepted. Model re-specification was then carried out to improve the fit measures by examining the indicators' factor loading based on alpha coefficient greater than 0.7 (Nunally, 1978) and evaluating measures that had large standardized residuals and modification indices (Kenny, 2011). Following this process, two items which were found to have low factor loadings (LII4 = 0.08, LII2 = 0.41) were removed. Inspection of the modification indices found no significant error terms in the model. Standardized residual covariances was then inspected for large residual value of 1.96 (Brown, 2015) which resulted in the removal of items ASE3, LLE2 and SAT3. The respecified model showed significant improvements with all measurement fit indices ($\chi 2$/df = 1.553, GFI = 0.990, AGFI = 0.975, TLI = 0.991 and CFI = 0.996, RMSEA = 0.032, p-value = 0.084) meeting the minimum acceptable level of value requirement for good fit.

Table 2

Convergent and Discriminant Validity

Discriminant Validity					Convergent Validity	
	SAT	LLE	ASE	LII	C.R. >0.5	AVE
SAT	0.883				0.88	0.78
LLE	.643**	0.694			0.78	0.64
ASE	.533**	.637**	0.820		0.79	0.65
LII	.376**	.356**	.399**	0.599	0.63	0.46

Note. **. Correlation is significant at the 0.01 level (2-tailed).

Convergent validity using composite reliability computation was carried out to measure the extent to which the set of indicators accurately represented a variable (Hair et al., 1998). A threshold value of 0.5 was set for composite reliability in the testing of convergent validity (Johnson & Stevens, 2001) and discriminant validity was determined based on square root of average variance extracted (AVE)

greater than the correlations between the constructs (Wixom & Todd, 2005).

The results in Table 2 showed convergent and discriminant validity for all the observed variables. It is worth noting that the average variance extracted (AVE) value for LII construct was lower than the acceptable value of 0.5 (Hair et al., 2010). Fornell and Larcker (1981) postulated that the convergent validity of the construct is still adequate in the case of AVE having a value that is less than 0.5 but a composite reliability which is greater than 0.6. Therefore, the AVE value for LII construct was accepted.

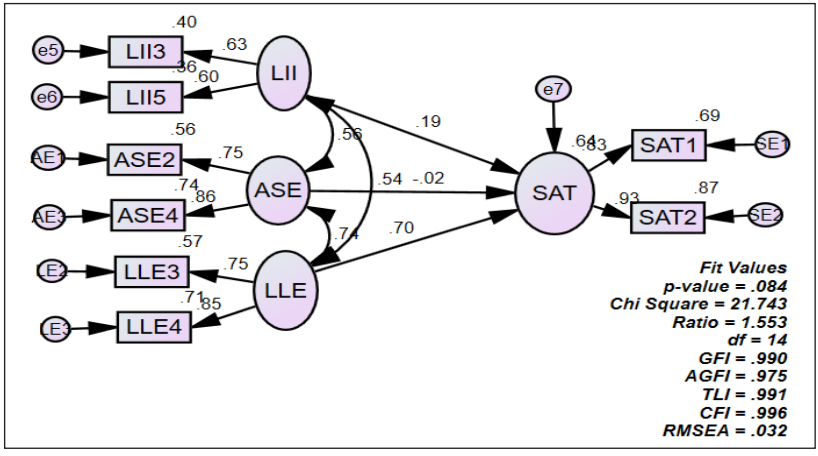
Although the results eliminated concerns of multicollinearity issues, it does not establish the causal relationship between online learning motivation and its predictors that requires confirmation using multi-regression analysis.

Path coefficients

A combination of path coefficient, critical ratio (t-value) and p-value were used in the estimation of structural regression model of the regression path between dependent variable and its predictors (Table 3).

Table 3

Multi-Regression Model (Standardized Estimates)



(continued)

Hypo No.	Unstandardized estimates Hypo. Path	Path Coeff.	T-Value (C.R.)	P-Value	Decision
H1	SAT <--- LLE	0.682	7.923	***	Supported
H2	SAT <--- ASE	-0.026	-0.306	0.759	Not supported
H3	SAT <--- LII	0.326	2.744	0.006	Supported

Standardized coefficient of the regression model showed an R^2 coefficient of 0.64 (Table 3) implying that 64 percent of the proportion of variance in student motivation (SAT) can be explained by the model. The outcome of the unstandardized estimates showed significant impact (coeff. = 0.682, C.R. = 7.923, p = 0.000) of location learning environment (LLE) on student motivation (SAT). It lends credence to the first hypothesis (H1) indicating the importance of a conducive home learning environment in fostering student motivation in online learning. Medical studies have proven that both visual (Lotto & Holt, 2011) and auditory perceptions (Edwards, 2016) are vital in cognitive processing and development. While vision perception is used in gathering information through the process of absorbing, organizing, and making sense of what one sees, auditory perception is the ability to receive, interpret information and attach meaning to sound. In this experiment, 34 percent (n=182) of the respondents indicated that they faced some level of distraction during online lessons. Of those affected, 52 percent (n=95) felt dissatisfied and lacked motivation to actively take part in online learning. Distractions to these two senses impair students' ability to adequately digest lessons delivered through personal computers resulting in learning difficulties eventually leading to students being dissatisfied. It aligns with the statement made by the informant that students who study at home through online learning, not by choice and being away from regular physical social interactions would feel isolated. This situation tends to induce stress. Unconducive home study environment could affect their academic performance, further increasing their emotional and psychological stress levels and in turn affecting their motivation to study.

Findings on learner-instructor interaction (LII) on online learning motivation (SAT) revealed a significant causal relationship (coeff. = 0.326, C.R. = 2.744, p =0.006). This result conforms with past studies (Croxton, 2014; Bickle et al., 2019) inferring the importance of instructor's interactions in motivating and encouraging students to take an active role in online learning. The criticality of this role

increases during a sudden unplanned implementation of online pedagogy where students not used to this type of independent and self-disciplinary culture often look up to the instructor for guidance. The statement from the expert on students requiring hand-holding from a Malaysian educational cultural perspective lends credence and provides the testimony that fully supports the third hypothesis (H3) that unless or until students grasp the discipline of online learning, the instructor continues to have a strong influence on students achieving the desired learning outcomes.

Contrary to past studies (Shen et al., 2013; Lin et al., 2008; Peechapol et al. 2018) showing a positive effect of self-efficacy on motivation, this study revealed a weak link (coeff. = -0.026, C.R. = -0.306, p = 0.759). Although the two items representing self-efficacy "I manage my online study time effectively and easily complete assignments on time" and "I believe a complete course can be given on the Internet without difficulty" reflected Shen et al.'s (2013) self-efficacy of completing an online course, there was no evidence suggesting a causal effect with the dependent motivation variable (H2).

Interview Results

In our quest to understand the online learning motivation impact in an enforced homebound situation from a psychological perspective, three questions were asked to obtain expert feedback during face-to-face interview session.

The first question is how a prolonged and enforced home stay would impose mental stress on students?

> The expert's response, "*This would induce stress on students ... do not have external entertainment and becoming like some kind of isolation." and "…no social interaction with others except their own family members*". These indicate the possibility of psychosomatic illness arising from psychological stress that could adversely affect students' learning under such an environment. The stress is exacerbated by a sudden change to online pedagogy resulting in students experiencing cognitive dissonance, feeling confused and not knowing what to do.

> The expert attested by stating, "*In Malaysia (education) culture, students require spoon feeding but this is no longer possible in online learning where students are required to go through the syllabus themselves…induces stress as students are not used to this type of culture yet*".

The second question is about home environment distraction.

> The expert responded saying "*Family members especially parents are most important to help them out during this situation*". This acknowledges the critical contribution of family support in providing students with a conducive environment. He went on to assert that, *"... students to decide on the priority and manage their time properly and spend more time on their studies as this is a sudden change*". The statement implies the need for self-efficacy in managing assignments, synchronous and asynchronous learning, e-learning activities such as quizzes, watching video lessons, online assessments and other online activities that are completely new to students. This is supported by another statement stating, "*... during face-to-face the students only need to pay attention during the lecture but now they are completely alone in managing their own time*".

The final question helps this research to understand the impact of students and instructor interaction under such circumstances. It is made up of two sub-questions. The first is whether the students are prepared for the engagement and second, how do they improve the effectiveness of home online learning.

To the first sub-question, the expert opined that, "*...unlike (physical) class…, it is difficult for the lecturer to know whether the students are listening*" and that "*lecturers have to either approach individual students… or use some assessments to gauge their understanding*". These statements implied that instructor support is crucial in taking the necessary action to ensure students stay engaged during their studies. The response given to the second sub-question indicated that the role of an instructor cannot be undermined. The response from the expert that, "*Students should inform the lecturer that they are struggling with the lesson*." and "*... provide help for students*

including advice that would help them to improve over a period of time", speaks volumes of the essential role of the instructor in helping students settle into the new learning environment and alerting parents or institutional counsellors of any psychological issues that might affect their learning capabilities.

Apart from this interview, a separate study was carried out by the expert on the exposure of restrained stress and social isolation using Swiss Albino mice (Chuang et al., 2021). The outcome showed that mice subject to stress exposure induced fear and anxiety-like behavior affirming the results of the first interview on the possibility of psychosomatic illness arising from chronic exposure to stress. One positive outcome from the experiment is that no significant deficit was found on motor coordination, neuromuscular ability, locomotion, and exploratory behavior (Chuang et al., 2021) which indicated that although stress affected the mental state, the physical ability of the subject was not affected.

Supplementary questions were posed regarding the results of the experiment. In response to the question of stressed-mice showing significant increase in toll-like receptor 4 (TLR4) and whether humans would have the same effect, the expert stated that "*TLR4 is one of the major receptors that is responsible for the neuroimmune system… activation of the TLR4 will activate the neuroimmunity cells in the nervous system that will bring about the emergence of neuroinflammation*". Neuroinflammation is the activation of the brain's innate immune system in response to an inflammatory challenge (Milatovic et al., 2017) and if left untreated could lead to several psychosomatic and neurological illness such as depression (Mukhara et al., 2020). To another supplementary question on whether lipopolysaccharide-rhodobacter sphaeroides (LPS-RS) can be used on humans since treated stressed-mice showed a significant decrease in ethanol drinking, the expert postulated that although "*LPS-RS is a synthesized laboratory drug that can only be used safely on animal models, studies have shown that humans are able to naturally produce certain chemical components in the body that possess similar suppressing effect of LPS-RS on TLR4 that are observable in behavioral changes which is the adaptation of the stress level*". One such naturally produced chemicals or hormones is endorphin that helps the body to relieve stress and serves as a pain reliever and happiness booster (Berry, 2018). Other studies such as Cavalcante et al. (2017)

reported a 75 percent decrease in TLR4 expression following acute resistance exercise. In the light of these developments, it is essential for students doing online learning in an isolated learning environment and who are under stress from online learning to take breaks in between classes to stay socially connected with friends and family members or optionally, do some physical exercises. Also, maintaining a healthy diet with high fiber foods would help replenish energy loss and mental fatigue.

DISCUSSION AND CONCLUSION

This study was undertaken to examine the effect of online learning motivation during the Covid-19 pandemic. It consisted of three objectives. The first is to determine students' ability in adjusting to a socially isolated environment away from their peers in a homebound situation. The outcome of the study has shown that a learning environment with low visual and auditory distractions foster students' cognitive processing and development. These distractions are different from actions that are self-imposed such as sending texts, chatting on social media, or listening to music while taking an online course. Whilst the former illustrates a multitasking ability and the motivation of students in adjusting to a socially isolated online learning environment, the latter serves as an annoyance that inhibits cognitive ability and hence should be avoided.

The second objective examined students' mindset and their ability to manage online study. Results in our analysis showed that students' self-efficacy is no longer a motivation for online learning in the situation of an abrupt lockdown. This is because having a belief in one's own capabilities does not override the need for having functional infrastructure such as stable network connectivity, good broadband speed and learning management system (LMS), and functional personal computers that are crucial in an online learning environment.

Furthermore, the desire for information technology competencies is becoming a necessity to facilitate learner-instructor interactions in a virtual environment. For the instructor and students, there was unfortunately not enough time to build the required competencies. As a result, technical know-how was acquired on the fly which is instrumental for addressing technical glitches and ensuring a non-

disruptive online learning environment. Under such circumstances, self-discipline is key as students might have to watch playbacks of interrupted lessons and do tasks retrospectively while working on current assignments. Having such self-discipline would help to build mental toughness in students that might otherwise lead to a lackadaisical attitude as a result of succumbing to the comforts of a home environment.

The final objective is to examine the quality of learner-instructor interactions in an enforced online learning environment. The literature (Alqurashi, 2019; Robert et al., 2012) has postulated the positive effects of learner-instructor interactions in the online learning environment. This study has not contradicted past perceptions that indicate the importance of instructor's interactions in motivating students to take an active role in online learning. However, such culture of dependence on the instructor should change in asynchronous learning environments.

The quantitative findings contradicted assertions by the expert who stressed the need for self-efficacy on the part of students in their ability to manage multiplicative concurrent tasks that are associated with online learning. From a theoretical perspective, this phenomenon could be explained using Herzberg (1966) two-factor theory of motivation stipulating that satisfaction is derived from intrinsic motivation factors (motivators) and the presence of external hygiene factors.

When the MCO was declared by the Malaysian government as a mitigation action against the spread of Covid-19, schools and HEIs were forced to close causing disruptions in learning schedules and unfinished school curricula. Educational institutions addressed the anomaly by changing its pedagogy to fully online lessons. The unplanned and sudden transition caught both academicians and students off-guard. Many students struggled juggling with technology technicalities, interacting online with peers and instructors, and trying to concentrate in an environment that was not set up for learning. The situation was exacerbated with many students being involved in online learning for the first time. Unlike previous studies (Ludtke et al., 2009; Frenzel et al., 2007) where online classes were planned as part of their syllabus, the abruptness of the change had resulted in the lack of a proper transition and readiness in terms of infrastructure, location

environment and interactions with peers and instructors all of which formed the hygiene factors. This argument is supported by feedback from the survey in the open comments section regarding students' frustration with the lack of internet speed and network connectivity at their learning locations. Others spoke about the multi-faceted self-efficacy dimension (Shen et al., 2013), of unconducive environments, and learner-instructor interactions. The lack of hygiene factors in the form of an ideal learning environment affected the confidence of students and their self-determination in exerting control over their own motivation, behavior, and learning environment (Bandura, 1999). These in turn rendered self-efficacy as inconsequential. This finding established that in an unplanned and enforced situation, aside from intrinsic motivators such as students' own ability, it is critical to place priority on the readiness of hygiene factors as these could play a dominant role in motivating students to participate in online learning.

Unlike a situation of a planned transition to online pedagogy where both students and instructors are given the necessary time to prepare for the change, a sudden and unplanned transition can result in a different outcome. The experiment shows the criticality of hygiene factors. It is therefore essential that timely and adequate technical assistance be given to students and instructors by the institution. Given the significant relationship of LII, instructors must adopt a more humanist approach to learning (Sharp, 2012) by supporting positive emotions such as empathizing with students who are having difficulties in accessing their lessons online or submitting their assignments due to network infrastructure issues at their LLE. Instructors could offer alternative means of learning such as video recording lessons for students to play back later or using email to submit their assignments instead of using the institution's LMS. Furthermore, instructors could shorten lessons, intersperse with breaks, and gamify lessons to make them interesting while allowing time for students to become more accustomed to online learning.

A total of 21 percent of the respondents admitted that they were not able to manage their online studies due to distractions at home, the social media and generally a lack of self-discipline. It resonates with previous studies (Robert et al., 2012; Zureick et al, 2018) of a significant correlation between learning satisfaction and perception of the learning environment. Many parents take for granted that their children who

are already young adults would be able to handle the situation. Under such circumstances, students who are facing issues learning at home need to voice their concerns. In previous studies on LLE, emphasis was given to parental support (Gniewosz & Eccles, 2013), stimulating support materials (Biedinger, 2011), and infrastructure (Lynch, 1999). However, this study uncovered the importance of the conditions where learning takes place. Although Zureick et al. (2018) postulated about the negative impact of distraction, they did not address specifically the inconspicuous nature of online learning that is often not easy to detect if someone is studying or just lurking on the internet. This is the case as instructors are doing most of the talking during online mode with students listening in. In between online lessons, students would be having online interactions with their social circles, watching videos, playing online games, or even doing their assignments, all of which is difficult for a casual observer to discern.

Affected students need to send out a signal to their distractors when they are engrossed with activities such as online learning that requires their full attention. One way is to place a unique object next to them that represents the signal for people within their vicinity to recognize that they need some quiet time. Parents or guardians can help by monitoring activities that may serve as distractions. This was acknowledged by the expert that stress mediated by toll-like receptors (TLRs) could cause neuroinflammation activation (Chuang et al., 2021) that could lead to psychosomatic and neurological illnesses. Parental support under such circumstances is important to reduce the stress levels of students studying at home by providing a conducive learning environment. In addition, parents can prepare healthy food diet to reduce the possibility of neuroinflammation activation and symptoms related to depression and anxiety. Studies by Dallas (2017) have shown that eating healthy food releases “feel good” endorphins in the body.

THEORETICAL AND PRACTICAL IMPLICATIONS

As online learning becomes more entrenched in the future, students should strive to detach themselves from becoming over-reliant on instructors. In the new norm, students are expected to be more cognitively independent. Self-determination theory suggests that people are motivated to grow and change when their need for

competence, connection, and autonomy are fulfilled (Cherry, 2021). Instructors could contribute towards students' self-determination by leveraging on the flexibility of online learning that is less time-dependent and physically confined. This can be carried out by creating an atmosphere encouraging students to use online facilities such as search engines and private chatrooms during lessons that would help students organize and share their thoughts and opinions with instructors and peers. As lessons conducted via online cut across international boundaries, it brings a new level of cultural diversity and inclusiveness. This presents an opportunity for instructors to encourage students to build relations and engagements with global communities thus widening their exposure and fostering new ways of learning that are more self-determined and less reliant on instructors.

This study has illustrated the challenges of motivating students, and instructors in an online learning environment during the Covid-19 pandemic. These challenges were exacerbated by the prolonged duration of the MCO that compelled students to continue studying from home that were not built for learning. To lessen the hardship, all stakeholders especially policymakers, relevant authorities, industry leaders and non-governmental organizations must come together in strategizing a tactical and long-term plan to regain the confidence of the public in the way the pandemic is managed and coordinated. From the education perspective, priority would be for the provision of good infrastructure such as good broadband speed and lower subscription fees that would help ease the burden of the B40 group (the bottom 40 percent - low-income earners). The penetration rate for broadband was at 81.8 percent per 100 households (Malaysian Communications and Multimedia Commission [MCMC], 2017). During the Covid-19 pandemic, the internet traffic nationwide saw an increase of 32.1 percent resulting in a drop of Malaysia's 4G download speeds to 8.8Mbps from 13.4Mbps before the pandemic (Syazwina, 2020). This had exacerbated an already dire situation of an online learning environment where students were not able to follow lessons due to frequent interruptions. Authorities such as the MCMC should ensure that broadband operators meet their obligations to provide consistent quality of service to their subscribers. Although the MCMC has an escalation process for complaints, it is reactive in nature based on feedback from the public. Instead, they should proactively monitor the performance of broadband operators in the country.

Many higher education institutions (HEIs) have started providing emotional support to students affected by the pandemic. Although this is a good deed, it is not enough. Issues faced by students doing online learning are multifaceted and are not confined to psychosomatic disorders. It includes factors such as financial, technical, social interaction and others. While the emotional aspect of the support is addressed, there is not enough technical support given. In most cases, technical issues encountered by students are brought up to the class instructor. This has led to disruptions since most instructors do not have the competence to deal with such issues. As students are regarded as consumers of learning institutions, HEIs might consider setting up technical helpdesks for such purpose. Having such support reduces disruption in class as these issues are addressed by people with appropriate competencies.

The final implication is on the instructors. Reupert et al. (2009) have postulated the positive effect of having such traits in guiding and making students more determined to overcome the challenges associated with studying online. It was noted that a total of 39 percent of the students in this study were first time online leaners. Thus, in these trying times it is imperative for instructors to extend compassion, understanding and patience; in short empathy towards students struggling with their online lessons.

SUGGESTIONS FOR FUTURE RESEARCH

Due to the nature of this cross-sectional study that was undertaken because of an abrupt change in pedagogy to online learning in response to the Covid-19 pandemic, it was not able to monitor the long-term effects on students' academic performance and development. Future research may consider using longitudinal studies in examining the phenomenon more succinctly from a long-term impact perspective.

CONCLUSION

Finally, the adage, "A family that plays together stays together" has a special meaning during the period of restricted movement. It aptly applies to a moment of need when everyone in a family must play a part in considering each other's needs and to continuously motivate

one another. Supporting each other emotionally and psychologically allows family members to appreciate each other more, thus providing a catalyst for families to ride out the storm stronger together.

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