

Research Article:

Students' Adaptability on Unexpected Transition to Online Learning during COVID-19 Pandemic: The Role of Self Regulation Learning and Self Efficacy

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ABSTRACT

Students and lecturers are mostly accustomed to the physical learning environment in the classroom. The transition to online learning requires quick adaptation, and students often face challenges which cause hindrance in their learning. This paper aims at highlighting students' adaptability in online learning which can help university students and management to respond effectively to the variable factors, namely, self-regulation and self-efficacy. Based on the social cognitive theory of motivation, this study examines the relationships between students' self-regulation, self-efficacy and adaptability in online learning. Self-efficacy is examined as a mediator and moderator variable in the relationship between self-regulation and students' adaptability. The samples comprised of 238 students from private universities in Malaysia through a survey questionnaire. Partial least squares-structural equation modelling (PLS-SEM) was used to test the hypotheses. The results showed a direct and positive relationship for all direct relationships between variables. In addition, self-regulation and students' adaptability is significantly mediated by self-efficacy. However, in this study, the moderator analysis found no support. This study provides theoretical and practical implications to gain a better understanding of students' adaptability in online learning and proposed intervention for higher education institution to address and promote self-regulation and self-efficacy among students. By implementing such interventions, it is hoped that students are better able to adapt, stay motivated and in getting the most out of online learning.

Keywords: Self-regulation, self-efficacy, students' adaptability, online learning

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INTRODUCTION

Research on information communication technology (ICT) in the education realm plays a pivotal role (Ratheeswari, 2018) ever since the internet has been making its round in the 1990s due to its significant impact on the quality of education, particularly on the teaching and learning aspect (Noor-Ul-Amin, 2013). The intensity of this research began to take shape in the mid 2000 where concepts such as delivery system, learning environment, instructional methodologies were investigated (Umar & Jamiat, 2011). A sub concept in the delivery system that has gained traction among the ICT and education researchers alike is online learning (Park & Shea, 2020), such as in the form of online distance learning (Hartnett et al., 2011; Sung & Mayer, 2012; Harrison et al., 2017). One inference is that online learning will affect a student's future media experience; which in turn affects future mediated learning experiences (Rekkedal et al., 2003; Volery & Lord, 2000). Online learning is defined by the majority of education researchers as access to learning opportunities using some technology (Benson, 2002; Carliner, 2004; Conrad, 2002). Both Benson (2002) and Conrad (2002) define online learning as another form of distance learning in addition to traditional sources which helps enhance learners' accessibility and participation in higher education. Hence in this research, we shall look at online learning from a practical perspective; as an innovative way of learning through the use of Internet technology that provides two ways communication between instructors. While the trend of online learning is consistent with the current generation of instructors and learners who are more tech savvy (Narasuman et al., 2011), it should be noted that most of the higher education institutions in Malaysia didn't implement an actual online learning approach in their system but a hybrid or blended approach in the beginning (Haron et al., 2012; Wong et al., 2016). While the switch to actual online learning is expected to be fully materialise in times to come in Malaysia, the COVID-19 pandemic is a major catalyst that accelerate the switch in just a matter of months, starting in the early 2020. This was partly due to the action taken by the Malaysia government where it enforced its first movement control order (MCO) due to the COVID-19 pandemic breakout (Tang, 2020) and one of the restrictions it placed on the higher education institutions are generally students are not allowed to attend physical classes during MCO (Palansamy, 2020). Hence, adopting online learning as the primary mode in teaching and learning was the most viable option at that time and it still is even today. Even when COVID-19 pandemic is finally over in Malaysia, online learning is here to stay for good as it is part of "Empowering the Education Digitalization Agenda" strategic focus of Ministry of Higher Education (MoHE) in the long term (Higher Education Ministry Outlines, 2021).

There have been numerous researches conducted on online learning before the pandemic (Colorado & Eberle, 2012; Lu et al., 2013; You, 2016) and during the pandemic (Bao, 2020; Baber, 2020; Famulasih, 2020). However, there has been a lack of research that focus on the student adaptability aspect in terms of online learning. Online learning adaptability is an important aspect as successful adaptation through this mode will enable the students to have a mastery in understanding and applying the knowledge gain via online channel (Liu et al., 2014) and according to Xu and Jaggars (2013), one of the positive consequences

of this is gaining strong academic performance. Hence, online learning adaptability is crucial at this point of time considering the fact that this is the first time where mass higher learning students are using it in Malaysia. According to Kauffman (2015), students need to possess certain attributes such as good time management and conduct a proper self-evaluation just to name a few if they want to gain most of it through online learning. Those attributes can be represented by self-regulation in online learning (Barnard-Brak et al., 2010), which traditionally has been associated to conventional learning as well (Brydges, & Butler, 2012). Hence, self-regulation will be examined in this research as the independent variable to online learning adaptability as the dependent variable. The researchers are also interested to know how self-efficacy concept will affect the relationship between self-regulation and online learning adaptability. After all, self-efficacy plays an important role in influencing person behavior (Williams & Rhodes, 2016), which is appropriate to be used to investigate the earlier mentioned relationship in this research. Hence, self-efficacy will as be investigated as the moderator and mediator between self-regulation and online learning adaptability.

LITERATURE REVIEW

Self-Regulated Learning and Students Adaptability

Online learning atmosphere is emphasises on autonomy which needs self-regulated learning for learners to succeed. Self-regulation can be defined as a process that commenced by learners in putting their effort to control the effectiveness of their educational in several areas such as meta cognitive area which involved the metacognition skills as the strategies used by students to ensure learning process become effectively and able to perform their tasks well. In typical learning environments, researchers and educators regard learners who will effectively self-regulate because the best learners (Seufert, 2018). One study on self regulated learning conducted by Schunk and Zimmerman (2007), they describe self-regulation as regulating one's own actions. Students that use self-regulation set higher expectations for learning, incorporate more successful methods for learning, and exert more commitment and persistence.

Similarly, in online learning environments that offer high levels of learner autonomy and low levels of teacher presence, self-regulated learning looks to be vital for students. The students with a high level of self regulation tend to develop a positive perspective toward learning tasks, place associate effort in them, and keep persistent in their learning that lead higher ability (Zhu et al., 2020). In reality, experts argue that those with greater self-regulation are better able to learn and adapt to new circumstances. In a study conducted by the American Psychological Association in the Journal Scholarship of Teaching and Learning in Psychology, researchers at York University, Hadassah Academic College in Israel, and Oakland University investigated the extent a rapid transition to online learning impacts post-secondary students who are attempting to learn as the pandemic begins to unfold. They studied a sample of 1,217 college students from Israel who completed an online

questionnaire after transitioning to online learning during the COVID-19 pandemic. The data showed that post-secondary students who feel like they belong and have a high self regulation are better able to adjust to online learning.

Adaptability is the ability to adapt effectively to novel, unpredictable and potentially threatening situations, as described by the report. Moreover, the researchers explored the relations between adaptability to the pandemic, personality, and learning experience levels. They discovered that some groups of students are more adaptable than others and are better able to cope such as people who are more extroverted, high self regulated and higher in psychological openness meaning that you are more willing to try new things and look at things from a different perspective, more pleasant people, would be more likely to adapt to this new normal (Hood et al., 2015). In addition, the students with high level of self regulated learning skills have a tendency to use online classes more regularly (Hood et al., 2015). Further, self regulated learning is found to be important to enhance learning performance better (e.g., Hashim et al., 2015; Hood et al., 2015; Ifnedo 2017; Joo et al. 2018; Zhou et al., 2016). However, as more studies have been carried out to investigate the impact of self-regulation in the traditional academic setting, but less research has been found to apply self-regulated learning in the online learning environment, especially during sudden transition. Conclusively, students who able to self regulate their learning process basically understand their task roles better, capable in self-monitoring and evaluating the effectiveness of their learning strategies. Hence, as they are working independently it assist students to be proactive in a sense of goal-motivated, success oriented, organised and well planned which lead to better adaptation even during condition changes like COVID-19 pandemic. Therefore, based on the above arguments, the following hypothesis is proposed:

H1 : Self-regulated learning is positively related to student adaptability.

Self Regulated Learning and Self Efficacy

The idea of self-efficacy was proposed by Bandura (1997), who also initially created the social cognitive theory (Bandura 1986a). The question of how the behaviour changes were addressed by Bandura in self-efficacy (Mckim & Velez, 2016). Bandura termed self-efficacy as “peoples judgments of their capabilities to organise and execute courses of action required to attain designated types of performances” (1986a, p. 391). It is characterised as a perception of one’s ability to coordinate and enforce the action needed to achieve specific outcomes (Bandura, 1997). According to Bandura, it is the self-confidence to trust oneself in the ability to accomplish goals effectively and to achieve a favourable result.

Self-efficacy is one of the most critical psychological constructs, and because of its role in proper behaviour, it has also been deemed significant in many areas of psychology (Saeid & Eslaminejad, 2017). Broadly, self-efficacy plays a significant role in any human endeavour as it will determine the likelihood of success. As essential as acquiring skills and expertise, self-efficacy may be just as important to determine success. People with high self-efficacy are hypothesised to choose challenging but achievable goals as well as better determine

contingencies in achievement situation, and are often have reasonable expectations and attributing controllable factors (e.g. lacked commitment) to both performance and failure (Wang et al., 2015). Individuals with a high level of self-efficacy are more likely to set higher goals, rise above obstacles and pursue in meeting challenges. Adversely, individual with low self-efficacy tends to set lower goals, quit quickly and often dodge challenges (Versland, 2016). In connection with social cognitive theory, such perceive on oneself greatly influences the success of one's goals.

In theory, self-efficacy influences students' learning patterns and, conversely, learning practices such as the use of strategies can also impact self-efficacy beliefs (Schunk & Zimmerman, 1997; Zimmerman, 2000). When students use different techniques to achieve a task, their learning success can be mentally noted, which means that they are qualified in the learning task and therefore increases their self-efficacy (Schunk & Zimmerman, 1997). Similarly, Bandura (1997) also noted that the most significant source of self-efficacy is mastering experience, through which students build a deep faith in their ability to learn. It follows from this that both the use of a socially controlled learning strategy and self-efficacy are important for the learning of the student. Important research has shown that they are closely linked to each other (Bruning et al., 2013; Graham et al., 2005). Most researchers typically see self-efficacy as a predictor of students' use of self-regulated learning strategies (Bruning et al., 2013). Studies have shown that students with higher levels of self-efficacy tend to set more difficult goals and therefore use a wider variety of cognitive and metacognitive strategies to accomplish a task than those with less self-efficacy (e.g., Graham et al., 2005; Magogwe & Oliver, 2007), but in this study context, the authors investigated the role of self regulated learning towards self efficacy which students' major mastery experiences related to online learning happen in the online class and teachers are effective agents in facilitating the self-regulation of learning by learners during online classes (Kramarski, 2018). In this sense, the development and conceptualisation of self-regulated learning were essential to self-efficacy. Over many years, self-efficacy has become one of the most influential variables in self-regulated learning (Panadero et al., 2017). It will make a significant contribution by seeking suggestive evidence to support the effect of self-efficacy on performance, thus demonstrating the relative importance of self-efficacy as a motivational state (Carter et al., 2016). Therefore, developing self-efficacy may also be useful in helping to close the gaps in achievement over time (Soland & Sandilos, 2020), as self-efficacy is seen as a strong foundation on how people approach a task, particularly on the amount of effort that individuals exert to a given task through empirical study it is important and appropriate to investigate the role of self-regulated learning towards student's self efficacy during online classes. From a practical point of view, students can become more optimistic about their learning if teachers can motivate students with successful use of strategy to enhance their self regulation. On the basis of this, we proposed:

H2 : Self-regulated learning is positively related to self efficacy.

Self-Efficacy as Mediator between Self-Regulation and Learning Adaptability

The study of self-efficacy as mediator is not something new in the academia world as can be seen from the research conducted by Weiser and Riggio (2010), Abd-Elmotaleb and Saha (2013) and Høigaard et al. (2014). Its influence on the academia related concept such as learning engagement, academic achievement and college student's well-being is quite significant (Zhen et al., 2017; Yu & Luo, 2018; Udayar et al., 2020). However, most of the research were conducted within the conventional context and not within the online context. Hence, it will be interesting to examine how self-efficacy will act as the mediator between self-regulation and learning adaptability in the online environment based on the arguments below:

(a) Self-regulation and self-efficacy

According to Hodges and Kim (2010), self-regulation and self-efficacy have a reciprocal relationship where they tend to influence each other depending on the circumstances. Furthermore, Ghonsooly and Ghanizadeh (2013) posit that self-efficacy tend to play a more influential role as a mediator between the two in the academia setting. The authors further explained that proper self-regulation will lead to success in fortifying one self-efficacy and eventually affect the studied dependent academia variable such as academic achievement. This was consistent with Pajares (2002) research where he found that effective practises of self-regulation can lead to greater self-efficacy and success in different academic fields. Hence, increased use of self-regulatory strategies was related to increased self-efficacy (McAuley et al., 2011), even in the online learning setting (Bradley et al., 2017).

(b) Self-efficacy and student's adaptability

Students seems to have difficulty in adapting to the higher education institution environment when they just joined, particularly in learning tasks (Elias et al., 2010). In addition to that, the sudden shift from conventional learning to online or blended learning due to the COVID-19 pandemic will make it tougher for some students to adapt to it and eventually will affect their academic achievement. Self-efficacy concept in this aspect plays an important role as it allows students to adapt well and navigate the new learning environment, even though they lack online experience in the first place (Swan, 2004). This was concurred by Taipjutorus et al. (2012) in their study focusing on self-efficacy in the online environment. Other studies conducted by Warsito (2012), Bae (2015) and Pambudi et al. (2019) provide more evidence on the significant relationship between self-efficacy and adaptability within the higher education institution context.

The discussions above proved that self-efficacy is related to both self-regulation and learning adaptability and indirectly act as a central to both of it. Hence, the researchers would like to investigate whether the centrality in this case can play the role as a significant mediator in between self-regulation and student's adaptability. This is because past research conducted by the likes of BarNir et al. (2011), Huang (2017) and Royston and Reiter-Palmon (2019) had shown that self-efficacy can behave as a significant mediator in a similar scenario, including adaptability when it is the dependent variable (Pambudi et al., 2019).

Therefore, based on the above arguments, the following hypothesis is proposed:

H4: The relationship between self-regulation and student's adaptability is significantly mediated by self-efficacy.

In addition to that, based on the discussion in (a), we would like to propose.

H3 : Self-efficacy is positively related to student's adaptability.

Self-Efficacy as a Moderator

We extend the research model by introducing self-efficacy as a moderator of the relationship between self-regulation learning and self-adaptability on online learning. This proposition is rooted in the social cognitive theory (Bandura, 1986a; 1986b), which demonstrates that self-efficacy encompasses variability in cognitive and motivational processing among individuals and in academic settings, can result in variation in the perception of their self-adaptability. For example, higher self-efficacy might enable students to self-adapt online learning better; thus, this effect will be stronger for students with higher self-efficacy than for those with lower self-efficacy. As we will reason later, self-efficacy will shape how students interpret and respond to their self-adaptability in an academic situation (e.g., online learning) when they have higher levels of self-efficacy beliefs. Hence, self-efficacy can also be seen as a cognitive construct that expresses how students perceive their ability to perform tasks. As self-efficacy construct is subverted into a larger social cognitive theoretical context, it firstly requires clarification of a wider social cognitive model of psychological adjustment, and to understand the role of self-efficacy in adaptation and adjustment (Maddux & Lewis, 1995). Self-efficacy and student learning strategies have a predictive effect on students' academic achievements and have a significant effect on their learning outcomes (Stajkovic et al., 2018). Moreover, research on the impact variables of self-efficacy has shown that individual learning, achievement and self-regulation can be influenced by self-efficacy (Schunk & Usher, 2012; Williams & Williams, 2010). Concerning the effect of academic self-efficacy on learning behaviour, Zimmerman et al. (1992) have shown that self-efficacy influences the implementation of learning strategies in the learning process, particularly creating an adaptive cognitive environment in the face of sudden situational changes to ensure successful functioning of learning including time-planning, self-monitoring and assessment (Sun, 2019). This suggests that self-efficacy serves as a crucial self-regulatory resource to students' self-adaptability in online learning, particularly when they perceived higher self-efficacy than those students with lower self-efficacy. It is likely that when students with a higher level of self-efficacy, who appear more confident in their ability to pursue tasks, are more likely to engage in self-adaptability in online learning.

Reflecting Bandura's social cognitive paradigm, individuals with higher self-efficacy are better able to grasp the changing circumstances in their environment (e.g., online learning), to adapt and regulate their behaviour, and persevere when faced with challenges in their situation (Bandura, 1997). Individuals who have high confidence in their abilities prefer to

face challenging circumstances (e.g., adapt) rather than avoiding obstacles. These tendencies suggest that high self-efficacious students, due to their effective self-regulatory, may directing them to turn to self-adaptability resources when engaged in online learning. The positive effects of self-adaptation may flow through self-efficacy and taken as facilitating confidence (McLennan et al., 2017). Accordingly, we posit the following:

H5: Self-efficacy moderates the relationship between self-regulation learning and self-adaptability, such that the relationship will be stronger for individuals with high self-efficacy than those who have lower self-efficacy.

METHOD

Sample and Procedure

This study is conducted based on quantitative and cross-sectional research design. In order to test the proposed hypotheses, students from private universities in Malaysia were surveyed. To avoid issues with missing data, the online questionnaire was designed in such a way that respondents could not submit responses if they did not answer all questions. A total of 370 students from the surveyed universities were invited to participate in this study based on convenient sampling approach. Among the respondents, a total of 244 respondents returned the questionnaire successfully which is 65.94% of the total sample. Refer Table 1 for detailed information about the sample profile.

Measures

Participants completed a survey consisting of demographic characteristics and three validating measures.

Self regulation

Student's self regulation was measured using 24 item scale known as online self-regulated learning questionnaire (OSLQ) developed by Barnard et al. (2009) to assess respondent's self regulated during online learning. The respondents were asked to indicate the extent of their agreement or disagreement with each item on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The OSLQ was developed from an 86-item pool and then examined for their internal consistency and exploratory factor analyses results for data collected. Higher scores on this scale indicate better self-regulation in online learning by students. The OSLQ consists of six subscale constructs including: environment structuring; goal setting, time management, help seeking; task strategies and self evaluation. The internal consistency of scores derived from the measure was adequate, with a value of 0.90. When utilised in fundamental social science research, such as this study, Nunnally (1978) suggests that score reliability of 0.70 or better is appropriate. Cronbach alpha values varied from 0.67 to 0.90 when assessing the internal consistency of scores by subscale, indicating sufficient score reliability at the subscale level.

Self-efficacy

Self-efficacy is peoples judgements of their capabilities to organise and execute courses of action required to attain designated types of performances (Bandura, 1986). The current instrument used was adopted from Artino and Stephens (2009). The self efficacy questionnaire is a 7-items instrument that ask students' perceptions of expectancy for success and confidence in their ability to perform the learning tasks. The respondents were asked to indicate the extent of their agreement or disagreement with each item on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). Two sample items are as follows: "I believe I will receive an excellent grade in this class" and "I am certain I can master the skills being taught in this class". The Cronbach's alpha is reported at 0.91.

Student's adaptability

The variable was measured using the Adaptability Scale (Martin et al. 2013). The scale comprises 9-items that assess cognitive (e.g., "I am able to think through a number of possible options to assist me in a new situation"); behavioural (e.g., I am able to seek out new information, helpful people, or useful resources to effectively deal with new situations) and emotional (e.g. , I am able to reduce negative emotions such as fear to help me deal with uncertain situations) adaptability. The respondents were asked to indicate the extent of their agreement or disagreement with each item on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). Prior research has also provided evidence of validity for the scale via confirmatory factor analysis and adequate reliability (Collie et al., 2017; Martin et al., 2013) which is Cronbach's alpha was 0.80.

Table 1. Demographic details of respondents

Demographic variables	Number of participant (N = 244)	Percentage (%)
Gender		
Male	90	36.8
Female	154	63.1
Race		
Malay	7	2.9
Chinese	222	90.9
Indians	14	5.9
Others	1	0.4
Age		
18-19 years	127	53.4
20-21 years	85	35.7
22-23 years	27	8.8
24 years >	5	2.1
Level of study		
Undergraduate	244	100.0

Data Analysis

In order to test the assumptions, partial least squares–structural equation modelling (PLS-SEM) with SmartPLS3.0 (Ringle et al., 2015) was used. Data analysis was carried out by performing the PLS algorithm and bootstrapping procedure in two stage approach: the calculation assessment of measurement model and assessment of structural model. The aim is to produce estimates that help to address the hypotheses. Checking the moderation hypothesis is also included in the structural model assessment.

RESULTS

Descriptive and Correlation Results

Table 2 shows the mean, standard deviation and Pearson correlations of the study variables. All bivariate relationships among the study variables are statistically significant. The highest correlation is between student’s adaptability and self-efficacy, $r(194) = 0.628, p < 0.001$; and the lowest correlation is between self-efficacy and self-regulation, $r(194) = 0.577, p < 0.001$.

Table 2. Mean, standard deviation and Pearson correlations

Variable	Mean	SD	1	2
Self-regulation	3.39	0.53		
Self-efficacy	3.58	0.62	0.577	
Student’s adaptability	3.34	0.69	0.643	0.628

Note: N = 238. All correlations were statistically significant at the 0.001 level.

Model Assessment Results

Table 3 shows the internal consistency reliability of the measurement model. The Cronbach’s alpha shows high values at 0.921, 0.918 and 0.908 for student’s adaptability, self-efficacy and self-regulation. Likewise, the composite reliability values are high, ranging from 0.935 (self-efficacy) to 0.918 (self-regulation). Moreover, the average variance extracted (AVE) values for student’s adaptability, self-efficacy and self-regulation are above the 0.50 threshold, which explains that more than half of the respective indicator’s variance is explained by its latent variable. Hence, average variance extracted is achieved for every construct. At the indicator level, the results of the indicator loadings showed that most of the loadings are above 0.70 threshold value, suggesting that the indicators are reliable. According to Hair et al. (2017), any indicator loading below 0.70 should only be removed if it raises the composite reliability above its threshold value. However, the lower outer loadings had no effect on composite reliability for our constructs in the study. It was the average variance extracted (AVE) for self-regulation that was found to be below the acceptable value of 0.50. Therefore, we removed the problematic indicators from the construct one at a time so that the average variance extracted (AVE) would meet the threshold value. After two rounds of

removal process, we found that the average variance extracted (AVE) of self-regulation had achieved a value of 0.505.

Table 3. Reflective measurements model results

Construct	Item	Outer loading	Cronbach's alpha	Composite reliability	AVE
Student's adaptability (SA)	SA1	0.634	0.921	0.934	0.615
	SA2	0.833			
	SA3	0.814			
	SA4	0.798			
	SA5	0.763			
	SA6	0.849			
	SA7	0.758			
	SA8	0.769			
	SA9	0.815			
Self-efficacy (SE)	SE1	0.776	0.918	0.935	0.673
	SE2	0.795			
	SE3	0.710			
	SE4	0.807			
	SE5	0.861			
	SE6	0.893			
	SE7	0.883			
Self-regulation (SR)	SR3	0.677	0.908	0.918	0.505
	SR4	0.773			
	SR5	0.794			
	SR9	0.662			
	SR10	0.688			
	SR10	0.511			
	SR12	0.621			
	SR14	0.687			
	SR15	0.732			
	SR16	0.738			
	SR17	0.703			
	SR22	0.725			

Note: AVE = Average variance extracted

The heterotrait-monotrait or HTMT criterion was used to assess discriminant validity. Table 4 reveals that the heterotrait-monotrait correlations were below the threshold value of 0.85. These results provide the evidence of discriminant validity.

Table 4. Heterotrait-monotrait ratio

	Self-efficacy	Self-regulation	Student's adaptability
Self-efficacy			
Self-regulation	0.507		
Student's adaptability	0.564	0.485	

Structural Model Assessment

After assessment of the reliability and validity of the measurement model, the structural model was assessed. Results of the coefficient of determination (R^2) show that the research model explains 22.4% variation in the self-regulation construct and 32.5% variation in the self-efficacy construct. Therefore, the model explains the endogenous constructs moderately well (Chin, 2010). Table 5 shows that the effect sizes (f^2) of the predictors ranged from 0.289 to 0.081, indicating the presence of small to substantial effect size (Chin, 2010). Specifically, self-regulation has a substantial effect size ($f^2 = 0.289$) on self-efficacy and small effect ($f^2 = 0.081$) on student's adaptability. In addition, self-efficacy has a medium effect ($f^2 = 0.179$) on student's adaptability. Finally, in order to examine the model's capability to predict, one approach was used. The blindfolding procedure with an omission distance of $D = 7$ to generate the cross-validated redundancy (Q^2) values. The value for self-regulation is ($Q^2 = 0.149$) and self-efficacy value is ($Q^2 = 0.193$), which is larger than zero, explains that the structural model has predictive relevance.

Table 5. Hypothesis testing results

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	p-value	R ²	F ²	Q ²	Decision
H1	SR → SA	0.265	0.067	3.959	0.000		0.081		Supported
H2	SR → SE	0.473	0.066	7.169	0.000	0.224	0.289	0.149	Supported
H3	SE → SA	0.394	0.067	5.864	0.000	0.325	0.179	0.193	Supported

Notes: SR = Self-regulation, SE = Self efficacy, SA = student's adaptability. * $p < 0.01$, Coefficient of Determinations (R^2), Predictive Relevance (Q^2).

The results for hypothesis testing which is direct relationship are statistically significant at the 0.000 level (see figure 1). Specifically, the relationship between self-regulation and student's adaptability is statistically significant ($\beta = 0.265, p < 0.000$). Hence, H1 that there is a direct and positive relationship between self-regulation and student's adaptability is supported. H2 proposed that self-regulated learning is positively related to self-efficacy. The result from the PLS-SEM analysis support the hypothesised relationships. That is, there is a direct positive relationship between self-regulation and self-efficacy ($\beta = 0.473, p < 0.000$) and for the H3 proposed that self-efficacy is positively related to student's adaptability is supported based on the result shown ($\beta = 0.394, p < 0.000$).

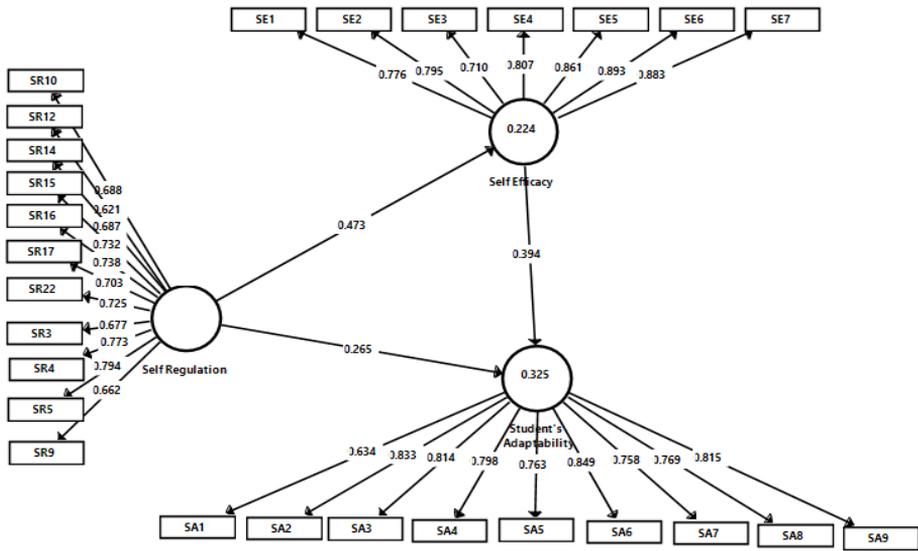


Figure 1. PLS path model with factor loadings, path coefficient, and coefficient of determinants (R2)

Table 6. Result of the mediator analysis

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	P-value	LL	UL	Decision
H4	SR → SE → SA	0.187	0.047	3.989	<.000	0.305	0.593	Supported

In H4, we predicted the relationship between self-regulation and students' adaptability is significantly mediated by self-efficacy. The bootstrapping analysis has shown that the indirect effect, $\beta = 0.211$ is significant with t -value of 4.22. The indirect effects 95% Boot CI Bias Corrected: (LL = 0.305, UL 0.593) do not straddle a 0 in between indicating there is mediation (Preacher & Hayes, 2008). Thus, we can conclude that the mediation effect is statistically significant. The result of mediation analysis is presented in Table 6.

Table 7
Result of the moderator analysis

Hypothesis	Relationship	Std. Beta	Std. Error	t-value	P values	Decision
H5	SR*SE → SA	0.038	0.034	1.146	0.126	Not supported

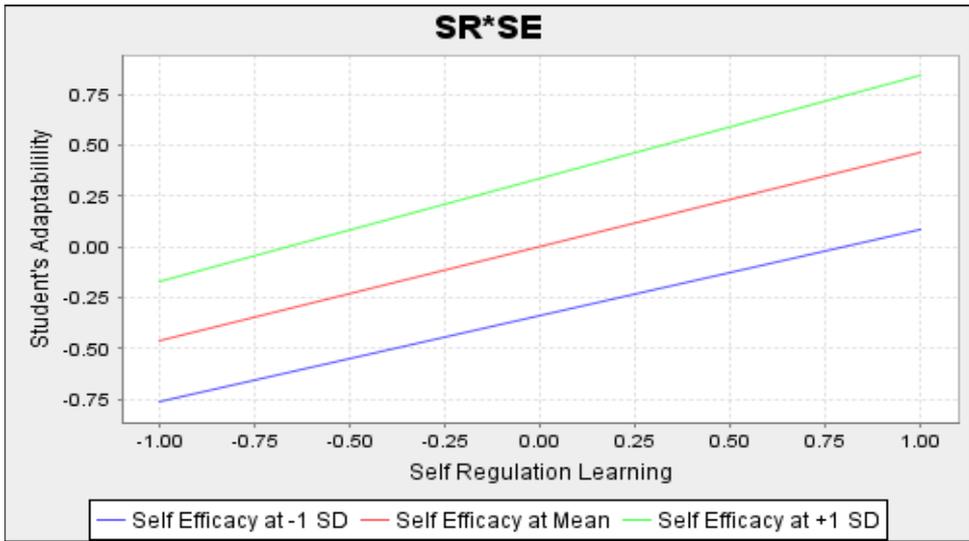


Figure 2. Interaction plot

H5 proposed that self-efficacy moderates the relationship between self-regulation and self-adaptability. However, the effect of self-efficacy does not significantly moderate the relationships between self-regulation and self-adaptability (p -values = 0.126). Therefore, H5 was not supported. The interaction plot (Figure 2) will be best to explain how self-efficacy moderates the relationship between self-regulation and self-adaptability. The result of mediation analysis is presented in Table 7.

DISCUSSION

A highly dynamic transition to online learning due to COVID-19 has been an activity for institutions of higher education. This research addresses the variables influencing the use and acceptance of online learning by students during stay-at-home orders due to COVID-19. In this study we examine the relationship between self-regulation learning, self-efficacy and student's adaptability during online learning to sudden transition change due to the pandemic. For H1, the finding supports the ideas that the role of self-regulated learning will influence the student's adaptability during online learning. The role of self-regulation learning is apparently an important factor in the learning process for university students. It is commonly believed that university students possess metacognitive skills to self-regulate their learning. In addition, evidence shows that highly self-regulatory learners are more competitive academically than those students with low self-regulation skills. (Xiao & Yang, 2019). This finding also in line with result from previous studies (e.g., Cho & Shen, 2013; Wolters, 2003; Lynch & Dembo, 2004) that argued student with effective academic self-regulation tend to realize superior learning outcomes which explains better adaptability in learning process. Decisively, students who are able to self-regulate their

learning process ultimately better understand their task tasks, are able to track themselves and assess the efficacy of their learning strategies. Therefore, when they operate individually, it encourages students to be constructive in a context of goal-motivated, success-oriented, coordinated and well-planned, contributing to better adaptation even during unexpected transition change like current pandemic situation.

Self-regulated learning was found to be directly related to self-efficacy. In light of social cognitive theory (Bandura, 1997) our finding is persistent with assertion that interactions between personal, behavioural and environmental factors are reciprocal. In theory, self-efficacy influences students' learning patterns and, conversely, learning practices such as the use of strategies can also impact self-efficacy beliefs. Pursuing this logic, when students use various strategies to accomplish a task, they can mentally recognise their learning progress, which means that they are competent in the learning task and therefore improve their self-efficacy.

Another crucial factor for the successful adaptability of students in online learning either during time of emergency or not is self-efficacy. The result found that there is relationship between self-efficacy and student's adaptability as shown in Table 4. The finding confirms prior studies stated that highly self-confidence students in applying various strategies in learning are more likely to accomplish better in their academic tasks which explain better adaptability (e.g., Abdullah & Ward, 2016; Alghamdi et al., 2020; Warsito, 2012; Bae, 2015). Self-efficacy beliefs influence the choice of assignments, effort, persistence, resilience and achievement, and are thus directly linked to academic success (Alghamdi et al., 2020). It is important to encourage the control of students when providing online teaching, and particularly during times of emergency, by encouraging them to recognise their skills and expertise to help them trust their own capabilities.

In H4, the result provides support for the idea that self-efficacy fulfils a mediating role in the relationship between self-regulation and students' adaptability in online learning as shown in Table 5. In line with previous studies (e.g., Ghonsooly & Ghanizadeh, 2013; Pajares, 2002; Bradley et al., 2017), our finding supported the importance of self-efficacy to play a vital role in exerting effects on confidence through cognitive processes in the relationship between self-regulation and students' adaptability. Self-efficacy has found to be a useful indicator for adaptation (Rogowsk et al., 2020). In light of social cognitive theory (Bandura, 1986a; 1986b), our finding is consistent with the claim that in cognitive processing, confidence in the ability to perform a particular behaviour, may increase the likelihood of students engaging in a self-adaptability in online learning. Following this logic, motivational beliefs in self-regulation makes students understand their task roles better and lead students to view themselves as efficacious in their study, hence making students to gain adaptability in online learning. This is, then, enable students to understand and subsequently use it.

In H5, we predicted interaction effects on students' adaptability. This hypothesis found no support as summarised in Table 6. We attribute the unexpected finding relating to self-

efficacy where there is no moderating effect of self-efficacy in the relationship between self-regulation and students' adaptability as the interaction term was non-significant. There is no adequate evidence to support self-regulation of students with high self-efficacy or low self-efficacy to adapt in online learning. Specifically, students with high or low self-efficacy would not strengthen or weaken the relationship. Contrary with Sun (2019) and McLennan et al. (2017), self-efficacy does not facilitate confidence which lead to students' adaptability in online learning. Although Luszczynska et al., (2011) expected that self-efficacy will moderate the planning-behaviour relation because students harbouring self-doubts (low self-efficacy) might fail to act upon their plans, the result of this study found no such significant relationship exists. Consequently, whether planning interventions (self-regulation) affect behaviour (adaptability) may not rely on the students' level of self-efficacy (the moderator). As such, self-efficacy is not necessary a precondition for such relationship to exist. Students do not need to obtain greater confidence in their own capability first, in order to adapt to online learning.

Theoretical and Practical Implications

Based on the findings from this study, several practical implications for better students' adaptability during unexpected transition to online learning and improve the use and acceptance of educational technology. First, both students and educators should promote an optimistic mind-set about a temporary situation should be encouraged. Students will need to be explained that their attitude can affect their educational experience and cognitive involvement (positively or negatively), so that they can actively try to develop their attitude towards the method of emergency delivery. In addition, it is crucial to talk and understand students' fear and make an effort to transform them into opportunities. Second is developing students' self-efficacy. Addressing the self-efficacy of students for online learning is another path to promoting self-regulation and discouraging procrastination. Two teaching techniques that have been proven to increase the self-efficacy of students for learning in both traditional and online contexts include helping students understand and set demanding, clear goals (Locke & Latham, 1990; Dabbagh & Kitsantas, 2004) and providing timely, truthful, and clear performance feedback to students (e.g., Bandura, 1997; Wang & Lin, 2007a; 2007b). Lastly, online discussion platform. The primary objective of online conversations is to encourage students to question, restructure, and synthesize their present information experiences by in-depth interactions with others (Artino & Stephens, 2009). The online discussion platform required as an effort to enhance students' critical thinking skills and other self-regulation strategies. This online discussion platform has been illustrated by some researchers also as way of enhancing teaching presence. For example, improved teaching presence can involve some of the following teacher behaviours during online discussions: setting the atmosphere for learning by modelling appropriate discussion posts, promoting, understanding and improving student contributions. Ultimately, these teaching practices will increase student's engagement to actively participate during learning process.

Furthermore, there are several theoretical implications derived from this study. First, this study complements to the existing body of knowledge on students' adaptability in learning, particularly students' adaptability during the sudden transition to online learning during the COVID-19 pandemic. Students are expected to cope and adapt rapidly from learning in physical environment to virtual learning environment which are less likely to run smoothly. Hence this research is among the earliest to empirically investigate students' adaptability in online learning during COVID-19 outbreak. As such, this will direct potential researchers to further investigate the underlying process that makes adaptability in online learning possible. Second, in studying students' adaptability in online learning, we investigate the role of self-regulation and self-efficacy in influencing students' adaptability. This study has further shown that the importance of self-regulation and self-efficacy on students' adaptability are substantial. With little monitoring from the instructors or lecturers, this study investigates how self-regulation and self-efficacy enable students to successfully learn in online environment. Taking into account social cognitive theory, we highlight the motivational process that explain the nomological framework between self-regulation, self-efficacy and students' adaptability in online learning. Acknowledging and incorporating the mediating effect of self-efficacy in self-regulation towards students' adaptability will add new knowledge of self-efficacy as mediator. Finally, it would be helpful to gain a better knowledge of student's adaptability and to propose approaches for higher education institutions to facilitate and improve online learning mechanism further.

CONCLUSION

Although the current study has several important theoretical and practical consequences, it also has some flaws that need to be addressed further. First, because the current study used a cross-sectional methodology, causal links between the studied variables cannot be established. For a more rigorous examination of the directionality of the correlations between the variables studied in this study, future research should use a longitudinal design comprising numerous waves of data collection or an experimental design.

Next, the study's data was gathered by single-source self-reports, which could be prone to method bias. Nonetheless, Conway and Lance (2010) and Spector (2006) argue that common method bias is exaggerated, and self-report questionnaires are appropriate for certain situations, such as gathering information about employees' internal states (e.g., attitude, emotion, and perception), as was the case in the current study. We evaluated students' perceptions in this study, and self-report measures are the best way to capture this information. Respondents were also informed of their anonymity, told that there are no right or wrong responses, and requested to answer the questions as honestly as possible to lessen the risk of common method bias.

Lastly, data was gathered from a convenience sample of 244 students enrolled in Malaysian private universities. As a result, the conclusions of the study may only be applicable to the sample that was analysed. However, because the hypotheses are based on strong theory

and empirical evidence, there is no compelling reason why similar findings should not be applied to other institutions. As a result, researchers are encouraged to test the current findings in diverse organisational settings and with different student groups.

In conclusion, this study explored the expectations of students from public and private universities in Malaysia about the sudden change during the COVID-19 pandemic to online learning. As is understood, the overall face-to-face education experience is designed to support learners, while effective online education requires time to recognise and build up (Patricia et al., 2020). Throughout emergencies, it is important to note that online or hybrid learning should be synonymous with innovative and versatile emergency response to the specific situation and as a result of its unique emergency circumstances that can increase the adaptability of the student, desires additional thinking and teamwork than most previous academic experiences. Another main future direction is to explore how online emergency learning could affect the future adoption of online learning. Students and educators have become very informed about the resources for remote teaching and learning, and if the teaching skills are positive, they will increase the acceptance of online learning. Conversely, if the expertise was negative, students and educators could have a false perceptions of the online learning atmosphere and avoid it. Hence, it is important to compare the perceptions of the students of the use and acceptance of emerging online learning. It will assist institutions of higher education to recognise similarities and differences and to establish strategies accordingly to improve better of our education system.

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