The Relationships between Infrastructure Access Towards Adoption of Online Learning in TVET Institutions

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Full Paper

Abstract

This study is to examine the relationships between infrastructure access provided by the organizations toward online learning platforms during Covid 19 pandemic. The pandemic Covid-19 has hit the world, which resulting face-to-face learning and teaching being converted to online learning. This scenario suddenly becomes a burden for lecturer as Politeknik Mukah Sarawak (PMU) is one of the Technical and Vocational Education and Training (TVET) institutions strengthen more on practical's and skills. The paper's hypotheses are generated using the Technology Acceptance Model (TAM). Cross-sectional data from the questionnaire were collected from 98 lecturers in PMU. Hence, the present study aimed to revisit the infrastructure access provided by institutions to lecturers using the approach in PLS-SEM. The Infrastructure Access and adoption of online learning were constructed as a reflective measurement model. The survey findings further revealed that infrastructure access is significantly associated with the adoption of online learning among lecturers in PMU. This research's outcomes can benefit decision-makers such as institutions, regarding funding and promoting successful online learning overall.

Keywords: infrastructure access, online learning, performance, Covid19

1. Introduction

In the face of the Covid 19 pandemic, online learning has become the main medium of teaching and learning in educational institutions in Malaysia. This situation is also experienced by TVET institutions where practicality and skills are the main thrusts in the delivery of teaching and learning. At PMU, all teaching and learning had to turn to theory and simulation alone. The use of ICTs (such as the Internet, computer, telephone, radio, video, and others) to assist teaching and learning activities is defined as online learning (Masrom, 2007). This great challenges to lecturers and students at once. Therefore, lecturers and students need to be mentally and emotionally prepared in the current phase of learning. Online learning approaches are being used by an increasing number of public and private colleges around the country, either to offer distance learning programs or to support full-time on-

campus students (Osman et al., 2009)(OUM, 2018). Infrastructure Access to online learning is very important in this process(Oliver, 2001). In addition to the facilities provided, the acceptance of lecturers and students is also very important. To aid in the development of the system, factors impacting the adoption and use of online learning must be identified. Theory Acceptance Model (TAM) claims that perceived ease of use and perceived utility of technology are predictors of user attitude toward utilizing technology, subsequent behavioral intentions, and actual usage (Davis, 1989). TAM has been used to test user acceptance of a variety of information technology, Davis (1989), Venketesh and Davis (1996) (Legris, Ingham & Collerette, (2003); Wu, Schank & Park, (2009), Sabli et al (2021). In this study, online learning was defined as a system that uses the Internet and web technologies to fulfill its objective of delivering information to students and interacting with them via a computer interface.

Finding from (Juhary, 2014) shows students and lecturer have positive attitudes toward using online learning, however technical concerns must be solved to ensure that online learning can function successfully. According to Hericko, Pusnik, and Polancic (2011), users' actual use of technology is heavily influenced by their behavioural intention, which, in turn, is influenced by their prior experience with the technology. Students' judgments of usefulness and simplicity of use, attitudes, and social influence may all play a role in determining their willingness to use online learning. Conferring to previous research (Kuama & Intharaksa, 2016), two areas need to be investigated further, sufficient, and effective Internet access, as well as Internet connectivity 24 hours a day, are required to tackle technological challenges. Second, the design and content of an engaging and practical online course are critical. The classes and exercises must also include sufficient explanations. Furthermore, learning task planning and content must be examined and altered regularly. Due to economic conditions, some students cannot afford to pay for internet capacity to access online learning media and their phones are unable to support their online learning (Simamora, 2020).

The demand for online learning-based courses is increasing as university students become more varied (Volery & Lord, 2000). To aid in the development of the system, factors impacting the adoption and use of online learning must be identified. Several aspects, including technological, pedagogical, and individual factors, must be considered when implementing an online learning effort successfully. However, because many previous studies on the efficiency of online learning systems lacked theoretical or conceptual frameworks, the results were inconsistent, leaving the question of what criteria determine effective online learning delivery unsolved.

Therefore, based on the discussion on infrastructure access and online adoption the following proposition would be hypothesized:

H₁: Infrastructure Access has a significant influence on the adoption of online learning among academic staff.

2. Methodology

The research is mostly a descriptive-analytical study based on primary data. The academic staff of PMU Sarawak in Malaysia served as the study's sample. A priori power analysis was conducted based on the suggested conceptual framework before determining sample sizes, and the minimal power was found to be higher than 0.95 with an effect size of 0.15. (Hager, 2006). The results were produced from statistical tests typically used in social and behavioural research using G* Power 3.1 (Faul et al. 2007; 2009) software. A total of 98 respondent from 150 populations was chosen to meet the minimum sample size criteria. The authors distribute 120 questionnaires in total. The TAM model was used to create the questionnaire (Davis, 1989). This study utilized a few standard statistical tools to analyse the data. SPSS (Statistical Package of Social Science)

Version 23 was used for this purpose. In the initial stage, factor analysis was performed on all the measurement items. Data were then keyed in into the Statistical Package for Social Science (SPSS) for subsequent analyses using SmartPLS 3.0 (Ringle, Wende, and Becker, 2015). A two-stage approach in PLS-SEM was used to predict the model, both Infrastructure Access and Adoption of online learning use reflective measurement.

3. Analysis and Findings

Table 1 shows the demographic details of 98 micro-entrepreneur sampled from academic staff in PMU. Given the number of questionnaire copies distributed and collected, a response rate of 82% suggests appropriate administration of the data collection process in a month and that non-response error is not a significant issue (Richardson, 2005; Nulty, 2008).

Table 1. Profile of respondent

Variable			*Frequency*	*Percent*
Gender	Male		45	45.9
	Female		53	39.1
Age	21-25		1	1.0
	26-30		33	33.7
	31-35		17	17.3
	36 and above		47	47.9
Status	Married		71	72.4
	Single		32	32.6
Department	JKA		13	13.3
	JP		28	28.6
	JKE		13	13.3
	JPA		8	8.16
	JTMK		4	4.08
	JMSK		10	10.2
	JKM		22	22.4
Education	PhD		4	4.08
	Master's degree		35	35.7
	Degree		57	58.2
	Diploma/STPM		2	2.0
Teaching Experiences	<1 year		8	8.16
	1 to 5 years		9	9.18
	6 to 10 years		20	20.4
	11 to 15 years		33	33.7
	< 15 years		25	25.6

3.1 Assessment of Measurement Model

The construct reliability and convergent validity of the constructs in this investigation were assessed in Table 2. The Adoption of online learning (0.874) and composite reliability (CR) values of 0.878 and Infrastructure Access (0.905) show that these constructs have internal consistency. After deleting items with low loadings, these

constructs also demonstrate good convergent validity. As a result, they reach an average variance extracted (AVE) value of 0.5, indicating that the items loaded to the corresponding constructs explain more than 50% of the constructs' "variances" (Hair, et al., 2014).

Table 2. Internal consistency and convergent validity

Construct	Item	Loading	Cronbach's Alpha	CR	AVE	Convergent Validity (Ave > 0.5)
Infrastructure Access	IA1	0.706	0.867	0.905	0.675	Yes
	IA2	0.782				
	IA4	0.774				
	IA5	0.819				
Adoption of online learning	CU1	0.826	0.874	0.878	0.725	Yes
	CU2	0.578				
	CU3	0.706				
	CU3	0.819				
	CU4	0.821				
	CU7	0.753				

The assessment of discriminant validity is shown in Table 3. Henseler's Heterotrait-Monotrait (HTMT) (2015) criterion has been used to evaluate discriminant analysis to date. This indicates that the constructs are separate from the criterion, which requires a stricter assessment than the previous criterion, implying that all constructs are distinct at the HTMT0.90 level (Henseler, et al., 2015)

Table 3. HTMT criterion

	Infrastructure Access	Adoption of online learning
Infrastructure Access		
Adoption of online learning	0.818	
Criteria: Discriminant validity is established at HTMT0.90		

3.2 Assessment of Structural Model

Table 5 illustrates the results of path co-efficient assessment using a bootstrapping procedure for the hypothesized relationships. The relationships are significant (Infrastructure Access→ Adoption of online learning, ß = 0.683, p < 0.01; Hence, it is supported.

Table 5. Path co-efficient assessment

	Beta	S.E.	t-value	p-value
Direct Effect				
Infrastructure Access -> Adoption of online learning	0.683	0.087	7.921	**0.000

In this study, the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) of exogenous variables on an endogenous variable are all

evaluated in Table 6. Infrastructure Access -> Adoption of online learning has a coefficient of determination (R^2) of 0.699.

Table 6. Determination of co-efficient (R^2), effect size (f2), and predictive relevance (Q^2)

	f^2	R^2	VIF	Q^2
Direct Effect				
Infrastructure Access -> Adoption of online learning	0.029	0.699	2.349	0.448

Lateral Collinearity: VIF 3.3 or higher (Diamantopoulos & Sigouw 2006)

R2 ≥ 0.26 consider Substantial (Cohen, 1989)

F2 ≥ 0.26 consider Substantial (Cohen, 1989)

Q2 > 0.00 consider large (Hair, 2017)

4. Conclusion and Recommendations

The aim of this study is to de examine the relationships between infrastructure access provided by the organizations toward online learning platforms during Covid 19 pandemic among academic staff in PMU. The results show Infrastructure Access has a positively considerable influence on the adoption of online learning among academic staff. This is because lecturers need to adapt according to the current situation for the sake of education in Malaysia. Although initially, the skill-based teaching and learning process is quite difficult to teach using online learning platforms. This study is also supporting by finding (Juhary, 2014), shown academic staff students' and lecturers have positive attitudes toward using the online learning.

It is very important for the institution to provide good internet facilities, computers, and other aids so that lecturers can effectively deliver lessons. In addition, shorter classes with lots of interaction can be crucial to a successful online session. To ensure that students are paying attention, pedagogy should be modified with videos, pictorial representations, and humorous comments. As we are forced to transition to an online education system because of the pandemic, we must conduct additional research to broaden its scope, improve its experience, and increase its success rate. Educational institutions should take the necessary steps to ensure that our next generation can benefit from online education and be successful in life.

Due to limitations of distributing to 98 respondents, the future will considerably be using the students and lectures in other institutions in Malaysia. Although face to face sessions will still be the main method in delivering teaching and learning for TVET institutions, online learning can also be used during this current situation.

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