User Behavioral Intention to Use Online Distance Learning (ODL): The Role of Self-Efficacy and Domain Knowledge

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Abstract—The rise of novel coronavirus 2019 has shifted the roles of education industry. Face-to-face have become a distant memory; students and educators are now heavily relying on the digital communication. Application such as Google Meet, Webex, Webinar, Stream Yard, Zoom, and many more have become the new norm among educators and students. However, the sudden dependency on the digital technologies raises a question on the user intention to use this new digital technology. Therefore, the objective of this study is to determine the role of self-efficacy and domain knowledge towards user behavioral intention to use online distance learning. An instrument was developed by adopting to previous instruments and was analyze using Statistical Package for Social Science and SmartPLS for inferential analysis. Findings shows that the exogenous variables are capable to explained between 47.8% to 68.1% of the endogenous variables.

Keywords—online distance learning, domain knowledge, self-efficacy, behavioral intention

1 Introduction

COVID-19 stands for coronavirus disease and is referred to as the new coronavirus or '2019-nCoV' for 2019. On 11 March 2020, the World Health Organization (WHO) classified COVID-19 as a global pandemic [1]. Because of COVID-19, thousands of school closures are being enforced worldwide. In April 2020, UNESCO [2] announced that 1, 576, 021, 818 students in 188 countries were affected at all levels of learning.

Among the Southeast Asian countries, Malaysia has reported a high number of COVID-19 positive cases [3]. On March 18, 2020, the Movement Control Order (MCO) was enacted in Malaysia [3]. The Minister of Health issued a set of regulations under the Prevention and Control of Infectious Diseases Act 1988 (the Act) as urgent measures to combat the spread of the Corona Virus. The MCO not only restricts movement, but has enforced the closure, whether public or private, of all non-essential premises, including kindergartens, schools, colleges, and universities.

Stopping all educational activities and sending their students home was the immediate response of universities and other higher education institutions. The closing of universities has contributed to the introduction of creative education approaches to ensure continuing education for students [4]. Universities are expected to turn to online forms of teaching and learning activities. With social distancing standards, all face-to-face classes have been suspended [5]. Online learning was widely promoted to replace conventional face-to-face learning [6].

A portfolio of learning strategies and materials that can cater to the various needs of learners across a range of learning environments needs to be created [7]. Several studies have also found challenges posed by online learning to students during MCO [8]. Many university students are not prepared for that mode. They lack knowledge on user behavioural intention to use or engage with Online Distance Learning (ODL). The performance of the online learning depends not only on the acceptance of the use of the technology, but also on the user's technology readiness and its self-efficacy on the Internet [9].

Therefore, due to the obvious challenges of ODL, this paper seeks to examine the relationship between self-efficacy, domain knowledge, perceived usefulness, perceived ease of use, attitude towards ODL and behavioural intention to use ODL in higher education to provide students, lecturers, and faculty management with a deeper understanding of future teaching and course development planning.

2 Research model

Figure 1 shows the research model of the study, adopted from Technology Acceptance Model [10]. There are a total of 6 variables altogether. A total of 7 hypothesis were formulated and subsequently explain below.
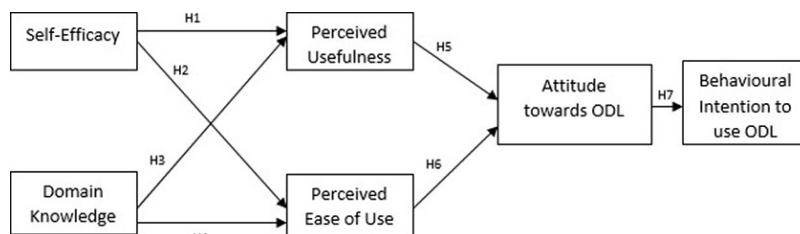

Fig. 1. Model for paper

TAM which proposed by Davis [10] highlighted that external factors may affect purpose and actual use through mediated effects on perceived usefulness and perceived ease of use. One of the factors emphasized by this study is domain knowledge. Das [11] pointed out that the way domain knowledge is structured in its computer incorporation aids knowledge collection.

Domain knowledge (an element of user personal infrastructure) also revealed as one of the key factors affecting information retrieval (IR) system use [12]. Furthermore, Ahmed Younis Alsabawy, Cater-Steel and Soar [13] stated that to ensure high quality of service delivery, two factors should be considered, consisting of system

and information quality. Information quality which related to domain knowledge is a critical element in measuring e-learning system success. F. Mohammadi, A. Abrizah, M. Nazari [14] studied teachers' perceptions of information quality in Farsi Web-based Learning Resources and highlighted 14 indicators of characteristic which indicated that information quality could reflect in measuring the success of information systems. Meanwhile Roca, Chiu, and Martínez [15] identified that that information quality had significant effects on user satisfaction, which directly affected the user's intention to use e-learning systems.

Arbaugh [16] stated that perceived usefulness of the e-learning would improve the attitude of students toward learning experience and students' consideration to enrol into online courses in future. E-learning users believe to accept useful educational services with high quality, whereby a secure environment of e-learning systems can contribute to support perceived usefulness. This includes security in information exchange between users, educational materials usage, and provision of respond to students' enquiries [13]. Thus, the ability of e-learning to support safe and secure environment may affect users' attitude towards ODL initiative. Likewise, Cerezo, et al. [17] highlighted that perceived usefulness may increase motivation for the learning task.

Volery and Lord [18] examined critical success factors in online education and found out that quality of a system was a key factor in measuring online education according two indicators: ease of access in navigation and interface. In addition, Tella [19] used seven indicators to evaluate e-learning system quality which comprise of availability, easy to use, user-friendly, interaction, accessibility, attractive features, and presentation. Furthermore, Eom and Stapleton [20] emphasized system quality as a system which possesses distinguishing characteristics which evaluated response time, systems accessibility, system reliability, systems flexibility, systems usefulness, ease of use, ease of learning, etc.

Chiu and Wang [21] stated that intrinsic values are significant predictors of students' intentions to continuously participate in e-learning. According to Muhammad Faizal Samat, Nur Amalina Awang, Siti Nor Adawiah Hussin, and Farahiyah Akmal Mat Nawi [22], selection of ODL platforms and tools should consider on healthy emotional state to ensure educators and learners could have intention to explore the technologies provided. Similarly, Khechine, Raymond and Augier [23] pointed out that intrinsic value is the significant contributor in the estimating behavioural intention and use behaviour in the context of ODL adoption. Therefore, based on the above arguments, the following are the hypothesis of the study:

H1: Self-efficacy has a positive and significant relationship with perceived usefulness.
H2: Self-efficacy has a positive and significant relationship with perceived ease of use.
H3: Domain knowledge has a positive and significant relationship with perceived usefulness.
H4: Domain knowledge has a positive and significant relationship with perceived ease of use.
H5: Perceived usefulness has a positive and significant relationship with attitude towards ODL.
H6: Perceived ease of use has a positive and significant relationship with attitude towards ODL.

H7: Attitude towards ODL has a positive and significant relationship with behavioural intention to use ODL.

3 Methodology

The conduct of this study is quantitative using questionnaire. An instrument was developed based on previous research and validated based on pre-test among experts. The selection of experts based on the following criteria: (1) academic qualification, (2) academic experience, (3) expertise within the field of Information System (IS). The expert review process took 2 weeks before the instrument was sent back to the researchers. The instrument was modified based on the recommendation and suggestion from the experts. Next, face validity was conducted. A total of 10 respondents were chosen from the Faculty of Information Management, Universiti Teknologi MARA Cawangan Kelantan. These respondents were excluded from the total sampling. Pilot test of instrument was carried out to determine the reliability of the instrument. A total of 60 respondents involves in the pilot test. The following Table 1 shows the results of the reliability analysis. The result of the Cronbach's alpha shows a value ranging from 0.770 to 0.963, indicating a sufficient result to confirm the reliability of the instrument as suggested by Nunnally [24].

Table 1. Reliability analysis of pilot study assessment

Construct	Items	Cronbach Alpha
SEF	5	0.770
DOK	4	0.873
PEU	4	0.910
EOU	3	0.900
ATT	3	0.924
BIU	3	0.963

The respondent of the study was selected based on convenience sampling. The respondents were chosen based on the following criteria: (1) undergraduate students enrolled with Universiti Teknologi MARA Cawangan Kelantan, (2) Students status currently active, and (3) enrolled for at least one subject that utilize ODL for the current semester. An invitation email was sent to undergraduate students that meet the criteria; a total of 524 valid responses were received. Data were coded, perform data cleaning, before analysis using SPSS and SmartPLS. The subsequent section describes the findings of the study.

4 Results and findings

The following Table 2 shows the demographic profile of the respondents. A total of 524 respondents have responded the survey. The gender profile showed 77.3% (n=405) of respondents are female, while 22.7% (n=119) are male. The age of respondent is mostly between 20 – 30 years (n=354 or 67.6%), below 20 (n=164 or 31.3%), 31–50 (n=5 or 1.0%) and above 50 (n=1 or 0.2%).

From the locality perspective, most respondents are from Kelantan (n=240 or 45.8%), Terengganu (n=65 or 12.4%), Pahang (n=53 or 10.1%), Selangor (n=52, 9.9%), Kedah (n=29 or 5.5%), Perak (n=25 or 4.8%), Johor (n=19, 3.6%), Kuala Lumpur (n=13 or 2.5%), Pulau Pinang (n=11 or 2.1%), Negeri Sembilan (n=8 or 1.5%), Melaka (n=5 or 1.0%), Perlis (n=3 or 0.6%), and Sabah (n=1 or 0.2%).

From the context of faculty, a total of 47.5% (n=249) respondents are from Faculty of Information Management, follow with Faculty of Business and Management 26.1% (n=137), Faculty of Administrative Science and Policy Studies 11.3% (n=59), Faculty of Accountancy 5.7% (n=30), Faculty of Art and Design 5.0% (n=26), and Faculty of Computer and Mathematical Science 4.4% (n=23). All the respondent divided into 67.2% (n=352) diploma level, 31.7% (n=166) of degree, and others 1.1% (n=6).

Table 2. Demographic profile

Item		Frequency	%
Gender	Male	119	22.7
	Female	405	77.3
Age	Below 20	164	31.3
	20–30	354	67.6
	31–50	5	1.0
	> 50	1	0.2
State	Kelantan	240	45.8
	Terengganu	65	12.4
	Pahang	53	10.1
	Kedah	29	5.5
	Perlis	3	0.6
	Pulau Pinang	11	2.1
	Kuala Lumpur	13	2.5
	Selangor	52	9.9
	Negeri Sembilan	8	1.5
	Melaka	5	1.0
	Johor	19	3.6
	Sabah	1	0.2
	Perak	25	4.8
Faculty	Faculty of Information Management	249	47.5
	Faculty of Administrative Science and Policy Studies	59	11.3
	Faculty of Business and Management	137	26.1
	Faculty of Accountancy	30	5.7
	Faculty of Computer and Mathematical Sciences	23	4.4
	Faculty of Art and Design	26	5.0
Level of study	Diploma	352	67.2
	Degree	166	31.7
	Others	6	1.1

Table 3 shows the result of the measurement model analysis. A total of 2 runs was conducted. During the initial run, all indicators meet the expected value as suggested by Hair, Sarstedt, Hopkins, and G. Kuppelwieser [25], except for SEF (factor loading 0.328). SEF5 was removed from the initial model (4.5%). A second run analysis shows that all factor loadings, average variance extract (AVE), Cronbach's alpha and composite reliability (CR) meet the expected threshold [25]. The factor loading for SEF between 0.628 to 0.846 (AVE 0.623, CR 0.867), DOK between 0.861 to 0.896 (AVE 0.731, CR 0.916), PEU between 0.846 to 0.917 (AVE 0.789, CR 0.937), EOU between 0.892 to 0.926 (AVE 0.834, CR 0.938), ATT between 0.914 to 0.941 (AVE 0.869, CR 0.952), and BIU between 0.959 to 0.970 (AVE 0.931, CR 0.976). Therefore, it is assumed that convergence validity has been ascertained.

Table 3. Final assessment of convergence validity

Construct	Indicators	Factor Loading	Average Variance Extract (AVE)	Cronbach's Alpha	Composite Reliability
Self-Efficacy (SEF)	SEF1	0.846	0.623	0.795	0.867
	SEF2	0.824			
	SEF3	0.839			
	SEF4	0.628			
Domain Knowledge (DOK)	DOK1	0.861	0.731	0.877	0.916
	DOK2	0.884			
	DOK3	0.775			
	DOK4	0.896			
Perceived Usefulness (PEU)	PEU1	0.846	0.789	0.910	0.937
	PEU2	0.902			
	PEU3	0.887			
	PEU4	0.917			
Perceived Ease of Use (EOU)	EOU1	0.892	0.834	0.900	0.938
	EOU2	0.926			
	EOU3	0.921			
Attitude Towards ODL (ATT)	ATT1	0.941	0.869	0.924	0.952
	ATT2	0.914			
	ATT3	0.940			
Behavioural Intention Towards ODL (BIU)	BIU1	0.966	0.931	0.963	0.976
	BIU2	0.959			
	BIU3	0.970			

Next step is to access the model for discriminant validity. A Fornell-Larcker Criterion was conducted. The following Table 4 shows the result of the Fornell-Larcker Criterion assessment. Based on the result, the square root of the AVE is bigger compared to its previous value, therefore indicating that discriminant validity has been achieved.

Table 4. Result of Fornell-Larcker criterion

	ATT	BIU	DOK	EOU	PEU	SEF
ATT	**0.932**					
BIU	0.781	**0.965**				
DOK	0.612	0.474	**0.855**			
EOU	0.818	0.678	0.677	**0.913**		
PEU	0.737	0.626	0.640	0.827	**0.888**	
SEF	0.610	0.502	0.736	0.670	0.648	**0.790**

The following Table 5 shows the result of a structural model analysis. The result show that all hypotheses were accepted. Self-efficacy has a significant and positive relationship with perceived usefulness (H1: Supported, t=6.947, p=0.000) and perceived ease of use (H2: Supported, t=7.619, p=0.000). Domain knowledge also has a positive and significant relationship with perceived usefulness (H3: Supported, t=5.855, p=0.000) and perceived ease of use (H4: Supported, t=7.009, p=0.000). On the other hand, perceived usefulness has a significant and positive relationship with attitude towards ODL (H5: Supported, t=3.429, p=0.001). Likewise, perceived ease of use also has a positive and significant relationship with attitude towards ODL (H6: Supported, t=12.715, p=0.000). Lastly, attitude towards ODL also has a significant and positive relationship with behavioural intention to use ODL (H7: Supported, t=42.395, p=0.000). The following Figure 2 shows the final structural model of the study.

Table 5. Relationship between variables (direct effect)

	Relationship	Coefficient	Std. Dev.	t-Value	p-Values	Decision
H1	SEF → PEU	0.387	0.056	6.947**	0.000**	Supported
H2	SEF → EOU	0.377	0.049	7.619**	0.000**	Supported
H3	DOK → PEU	0.355	0.061	5.855**	0.000**	Supported
H4	DOK → EOU	0.401	0.057	7.009**	0.000**	Supported
H5	PEU → ATT	0.192	0.056	3.429**	0.001**	Supported
H6	EOU → ATT	0.660	0.052	12.715**	0.000**	Supported
H7	ATT → BIU	0.781	0.018	42.395**	0.000**	Supported

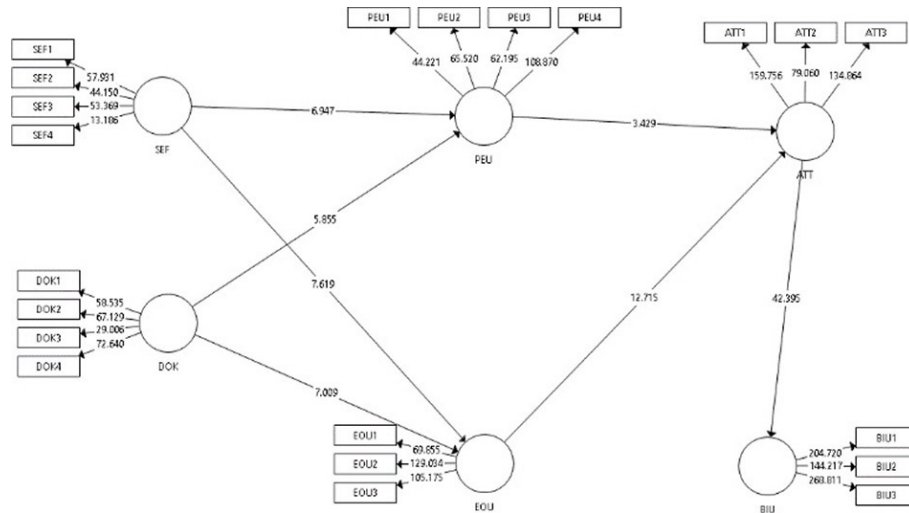*Notes:* *t > 1.645, p-value > 0.05, ** t > 2.58, p-value < 0.01.

Fig. 2. Final structural model of the study

The next Table 6 shows the R^2 result of study. Wherry [26] suggested that research should use the adjusted R^2 instead of the regular R^2 because there were some issues with regular R^2. Regular R^2 value increased when additional predictor constructs were included in the model. From the result shown on the Table 6, the exogenous variables of the study were capable to explain the 68.1% (moderate), 61% (moderate), 52.3% (moderate), and 47.8% (small) from the overall variance of perceived usefulness, perceived ease of use, attitude towards ODL and behavioural intention to use ODL [27].

Table 6. Result of coefficient of determination score

Construct	R Square	R Square Adjusted	Decision
ATT	0.681	0.679	Moderate
BIU	0.610	0.609	Moderate
EOU	0.523	0.521	Moderate
PEU	0.478	0.476	Small

The next step is to assess the level of effect size (f^2). Cohen [28] recommended that the f^2 values of 0.35, 0.15, and 0.02 were regarded as large, medium, and small effect sizes, respectively [29], [30], [31]. Table 7 shows the effect level of study size. It can be concluded that all constructs have an effect size ranging from 0.036 to 0.1.565.

Table 7. Assessing the level of effect size (f^2)

Relationship	f^2	Decision
ATT → BIU	1.565	Large
PEU → ATT	0.036	Medium
EOU → ATT	0.430	Large
SEF → PEU	0.132	Small
SEF → PEU	0.135	Small
DOK → EOU	0.111	Small
DOK → EOU	0.155	Medium

5 Conclusion

The study has investigated and identified the user behavioural intention to use Online Distance Learning (ODL). The study seeks to examine the relationship between self-efficacy, domain knowledge, perceived usefulness, perceived ease of use, attitude towards ODL and behavioural intention to use ODL in higher education to provide students, lecturers, and faculty management with a deeper understanding of future teaching and course development planning.

The result show that all hypotheses were accepted. The investigation led to identifying the role of self-efficacy and domain knowledge towards ODL since all students involved in online studies due to the changes of teaching and learning methods during Covid-19 pandemic. The study conducted based on convenience sampling of Faculty of Information Management, Universiti Teknologi MARA Cawangan Kelantan only and it may not be representative of the whole university.

The study has contributed to the effectiveness for online teaching and learning method used during COVID-19 pandemic as precaution actions to ensure schools and academic institutions can continue its operation in the education system. The implication of this study will be beneficial for the university to engage programs for successful implementation towards adopting Online Distance Learning (ODL).

6 Acknowledgement

7 References

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