



Online Teaching Adoption among Primary School Teachers during COVID-19 pandemic

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Abstract. During the Covid-19 pandemic, online teaching has been opted for continuity of education in light of healthcare protocol and social distancing. This study aims to examine the factors that influence primary school teachers' attitude towards online teaching based on Unified Theory of Acceptance and Use of Technology (UTAUT) framework. This study also explores the role of attitude on teacher's behavioural intention for teaching online. Partial least squares (PLS) estimation is employed to analyse the data collected from 135 primary school teachers based on Melaka state in Malaysia. The findings confirmed that performance expectancy, effort expectancy and social influence significantly influence school teachers' attitude for online class. Meanwhile, facilitating conditions did not significantly affect the attitude as the teachers were teaching from home and the online class was entirely based on teacher's personal capacity and environment. The performance expectancy was revealed to be the major predictor determinant and attitude positively affect teachers' behavioural intention. It partially mediates the performance expectancy and effort expectancy on teachers' intention towards online teaching. This study provides several practical implications for policymakers and educators to promote and strengthen the online teaching in the future. This study has potential limitations on the representativeness of primary school teacher given the barriers during the pandemic and future studies could address such concern for more robust and comprehensive findings.

Keywords: UTAUT, Online Teaching, Attitude, Covid-19

1 Introduction

In Malaysia, there was a nationwide movement control announced in March 2020 due to the outbreak of Covid-19. The unexpected disruption to conventional education routines has called for alternative pedagogical practices to be implemented. Consequently, Malaysia schools shifted from physical to virtual classrooms and embraced a variety of online applications such as Google Classroom, Telegram, WhatsApp and Zoom meetings [1]. Alongside the implementation of online modalities, school teachers nevertheless have encountered some unprecedented problems and challenges in the transition. School teachers that without adequate knowledge or experience in online teaching [2] could face stumbling block in performing their teaching task. Among problems that exist during the period include operating device for online class, resolving network disruption issues, managing virtual class and so on. Besides, schools' teachers are also confronted with higher levels of pressure due to new and unfamiliar situational problems. Thus, the quality of online education remains questionable [3].

UTAUT model was introduced by [4] with incorporation of elements based on previous eight models of user's intention to use technology. The model reveals four key constructs of technology adoption and usage behavior which are (1) performance expectancy, (2) effort expectancy, (3) social influence and (4) facilitating condition. The use of UTAUT model has been extensively tested in empirical studies for predicting and explaining of technology adoption [5], [6] but there is limited empirical evidence on primary education learning and teaching in relation to education technology. In addition, the perspectives of teachers are essential in studying the online teaching adoption, an area that should not be neglected. Thereby, this study attempts to fill the gaps by investigating determinants that affect primary school teachers' attitudes of adopting online teaching during the pandemic.

2. Literature Review

2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT being one of the most powerful models for explaining the individual's behavioral intentions in adopting certain technologies [7], [8]. The model is substantially employed for education research and mostly focused on tertiary education and relatively scarce on secondary and primary education. A wide range of context in relation to higher education based on UTAUT model were studied in the literature [9], [10], [11].

2.2 Performance Expectancy

[4] elucidated the term performance expectancy as "it is the extent to which a person believes that undertaking certain activities". It is redefined later as the degree a person thinks that technology acceptance and usage will provide benefits to the person from

executing a particular task [12]. The ideas of performance expectancy have been explored and discussed in varied context in many studies surrounded by different technology acceptance, for example Online Learning System for college students [10], Learning Management System for undergraduate [9] and Online Tutoring Platforms [11].

2.3 Effort Expectancy

Effort expectancy, a concept explained as "the extent of ease derived while using a particular system in place" [4]. The variable was accentuated as one's thought towards the process working with technology, to be less irritated and problem-free [12]. Past studies have asserted the role and importance of effort expectancy as predictive factor of behavioural intention [13], [14]. [15] have highlighted that any new technology that is easy and convenient in usage, it will trigger positive attitude and users' intention to use the technology.

2.4 Social Influence

Social influence is described as the degree which users perceive similar views of the importance on technology usage and feel they should demonstrate the same usage behaviour [12]. The effect of social influence on technology acceptance has been examined and discussed by many scholars and they found a positive relationship between social influence and behavioural intention [16], [17].

2.4 Facilitating Condition

Facilitating condition is the support of resources in executing technology adoption and promoting the usage behaviour at an organization [4]. Likewise, [18] described it as the extent to one hold about the provision of technical and organizational infrastructure within an organization to assist the use of a system. Study by [19] has inspected the influence of facilitating conditions on technology usage behaviour.

2.5 Attitude

According to [20], attitude is defined as an "one's positive or negative reactions about performing a specific manner." Meanwhile, [4] referred it as "an individual's overall affective reaction to using a system". [21] demonstrated that attitude is the most vital construct in determining positive perception and satisfaction of user for better work performance using technology.

2.6 Research Hypotheses

Based on the motive of the above discussion, thus five hypotheses below were proposed, and the relationships are demonstrated in Figure 1.

H1: Performance expectancy positively influences primary school teachers' attitude toward the online teaching.

H2: Effort expectancy positively influences primary school teachers' attitude toward the online teaching.

H3: Social influence positively influences primary school teachers' attitude toward the online teaching.

H4: Facilitating condition positively influences primary school teachers' attitude toward the online teaching.

H5: Attitude positively influences primary school teachers' online teaching intention.

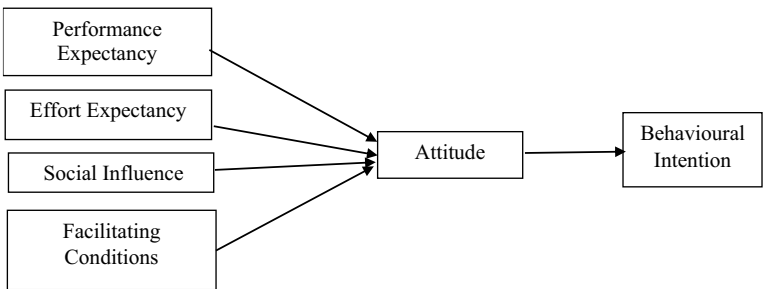


Figure 1: Research Framework

3. Method

A total of 135 primary school teachers were surveyed through a set of self-administered questionnaires. All data collection was conducted online using Google Form amid Covid-19 safety and health protocols. Purposive sampling was used to select the teachers. The measurement for all variables in this study were adapted based on past studies [21] using 5-point Likert scale. The estimation for data collected was conducted by using Partial Least Square Structural Equation Modeling to verify both measurement model and the structural model.

4. Findings

In this study, from the total of 135 primary school teachers, majority are female 88.9% compared to 11.1% male. Nearly 86% of the respondents are over 30 years old and slightly above 14% for 30 and below. The respondents are mostly Chinese (75.6%), followed by Malay (23.7%) and Other (0.7%). In terms of teaching experience, 91.1%

of teachers have more than 5 years' experience of teaching students and 8.9% with experience up to 5 years.

4.1 Measurement Model

Table 1 shows all factor loadings exceeded the proposed level, all values for the composite reliability obtained are above 0.9, surpassing the minimum value of 0.7 which required by [22]. Further, the reported Average Variance Extracted values ranged from 0.7734 to 0.845 that is in line with the required value from [22]. Hence, all evidence supports internal reliability consistency and the convergent validity for all constructs.

Meanwhile to assess the discriminant validity, HTMT criterion was used [23]. Table 2 exhibits the results for the discriminant validity based on HTMT criterion. [24], [25] recommend that the HTMT ratio should not more than 0.9 or 0.85 for all constructs. Based on all suggestions mentioned, all HTMT ratio in this study were within the acceptable values and therefore the discriminant validity is confirmed.

4.2 Structural Model

Table 3 presents the results of structural model. The Variance Inflation Factor (VIF) is used to confirm the collinearity problem among the constructs. The VIF values for all constructs ranged from 1 to 3.324 implying that collinearity is not a problem among the predictor constructs. The effect size, f^2 for all constructs that are significant were examined. As proposed by [26] if the f^2 value is greater than 0.02, the effect size was confirmed. The constructs for performance expectancy, effort expectancy, social influence, and attitude are verified to have the effect size given each f^2 value is more than 0.02.

The R^2 value for attitude is 0.694 and for behavioural intention is 0.609, suggesting both have moderate ability to predict behaviour. Performance expectancy ($\beta = 0.493$, t -value = 5.374), effort expectancy ($\beta = 0.234$, t -value = 2.395), social influence ($\beta = 0.154$, t -value = 1.709) significantly influence primary school teachers' attitude toward the online teaching. Attitude ($\beta = 0.781$, t -value = 18.735) significantly influence primary school teachers' online teaching intention. Hence, H1, H2, H3, and H5 are empirically supported.

Table 1. Convergent validity

Construct	Indicator	Factor Loading	Composite Reliability	Average Variance Extracted
Performance Expectancy	PE2	0.874	0.955	0.808
	PE3	0.911		
	PE4	0.943		
	PE5	0.925		
	PE6	0.839		

Effort Expectancy	EE1	0.885	0.953	0.773
	EE2	0.88		
	EE3	0.918		
	EE4	0.918		
	EE5	0.878		
	EE6	0.791		
Social Influence	SOI1	0.894	0.932	0.775
	SOI2	0.915		
	SOI3	0.86		
	SOI4	0.85		
Facilitating Condition	FAC1	0.861	0.948	0.821
	FAC2	0.94		
	FAC3	0.949		
	FAC4	0.873		
Attitude	ATT1	0.941	0.954	0.874
	ATT2	0.933		
	ATT3	0.93		
Behavioural Intention	BIN1	0.971	0.977	0.934
	BIN2	0.968		
	BIN3	0.961		

Table 2. Discriminant validity (HTMT)

Construct	1	2	3	4	5	6
1. Attitude						
2. Behavioural Intention	0.824					
3. Effort Expectancy	0.781	0.706				
4. Facilitating Condition	0.615	0.541	0.76			
5. Performance Expectancy	0.836	0.71	0.74	0.538		
6. Social Influence	0.737	0.687	0.802	0.713	0.688	

Table 3. Partial least square results

Hypothesis	Relationship	Std Beta	Std Error	t-value	f2
H1	Performance Expectancy -> Attitude	0.493	0.092	5.374**	0.384
H2	Effort Expectancy -> Attitude	0.234	0.098	2.395**	0.054
H3	Social Influence -> Attitude	0.154	0.090	1.709*	0.031
H4	Facilitating Condition -> Attitude	0.058	0.093	0.627	0.005
H5	Attitude -> Behavioural Intention	0.781	0.042	18.735**	1.56

Note: *p < 0.05, **p < 0.01

5. Discussion

The findings reveal that performance expectancy has a positive correlation on primary school teachers' attitude towards online teaching. Thus, H1 is supported. The positive influence of the variable is consistent with past study [27]. The results in this study indicate that job performance is quite likely to increase teachers' desire to adopt online teaching as they perceive the online tools are beneficial and most importantly increasing their job productivity and effectiveness during the Covid -19 pandemic.

Effort expectancy was found to have a positive association with attitude. Hence, H2 is supported. Previous studies, for example [28] confirmed positive impact of effort expectancy on continuous intention for e-learning platforms usage based on student perspectives. Therefore, school administrators and higher authority should consider this factor when enforcing online teaching whether as substitute or complementary method to conventional offline teaching.

In addition, social influence was proved as important predictor of teachers' attitude towards online teaching. Therefore, H3 is supported. This result is in consistency with study from [29] where attitude is significant in determining teachers' intention in using technology. In this study, teachers' attitude may be shaped by influences from a specific individual or a group of individuals [30] which include school authority figures, colleagues, parents and students. The interactions, sharing, and feedback within or between teachers with these people may affect teacher's willingness for online teaching.

[31] asserted that facilitating conditions being as crucial factors for the usage of app service usage and it is positively linked to users' satisfaction. However, in this study, the results contradict with literature where the positive influence on individual intention were confirmed in past studies [17], [19]. As such, H4 is not accepted. In this study, facilitating conditions are related to the availability of an adequate infrastructure and supportive teaching environment to facilitate the usage of online tools. Teachers were teaching from home during movement control period, and this may be the main reason of why facilitating conditions were perceived not as predictive factor of teachers' attitude and behaviour intention.

Attitude was revealed to have positive effect on teachers' behaviour intention. So, H5 is accepted which is consistent with past study by [18]. The Covid -19 pandemic has impacted teachers' attitude to switch from offline teaching to online teaching. The positive attitude indicated that teachers' positive feelings and motivated of adopting online tools for educating students.

6. Conclusion

The findings in this study give further empirical evidence and insights on the significant roles of explanatory variables such as performance expectancy, effort expectancy, social influence and attitude in understanding the users' perception and acceptance of technology model, UTAUT.

The integration of attitude into the extended UTAUT model will not only enrich the growing body of knowledge in this research subject but also serve as a basis for future research. This study would be able to provide useful insights to government to develop better planning and strategies for establishing necessary infrastructure and training for primary school teachers in relation to online teaching. This will thus help to accelerate the online teaching adoption rate among primary school teachers.

This study has some limitations which include (1) the respondents surveyed were not from diverse background neither ethnicity nor sampling area. The majority respondents belong to Chinese primary school teachers, having inadequate participation of Malay and Indian school teachers. Moreover, the study focused only on primary schools in Melaka state. (2) all data collection was carried out online using Google Form, without physical contact during Covid- 19 pandemic. This barrier may affect the quality of survey in nature. As such, future works are suggested to improve the representativeness of respondents from more diverse backgrounds as to achieve greater generalizability of study. The well-represented primary school teacher's population will generate more insightful empirical findings and thus better implications. Future research should consider using face to face data collection method to maintain the good quality of survey response.

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