Technology Application among Teachers from Rural Schools in Johor

by Nurliana Nasution

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Technology Application among Teachers from Rural Schools in Johor

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Abstract

The COVID-19 pandemic has disrupted the world's education system, including Malaysia. This disruption has affected approximately 1.6 billion students in more than 200 countries. The closure of educational institutions has caused various changes in people's lives. This research examines the associations between institutional support, perceptions of usefulness, personal innovation, perceived social pressure, and age with the application of technology among teachers from rural schools in Johor. One hundred ten teachers were involved in this study. The results showed that perceived usefulness, personal innovativeness, and perceived social pressure had influenced technology adoption among the teachers from rural schools.

Keywords: Technology application, e-learning, teaching and learning process

1.0 Introduction

The pandemic phase that began from March 2020 until year 2022 had changed people's lives and put an increase in global issues. The movement control order (MCO) was introduced by the Malaysian government to control the spread of this epidemic. The conditions to exercise physical, social distancing, and limited movements had restricted the regular educational practices, where the previous collaborative learning sessions ran normally and traditionally in schools. The reopening of schools had also caused many standard operating procedures to be implemented, and teaching sessions could not be fully implemented. The COVID-19 pandemic had also triggered educational institutions to implement different learning approaches. The current needs have caused schools to implement innovations in teaching and learning methods by introducing digital learning. Due to that, all physical activities had to be implemented online, including the educational sector, namely schools and universities, because the original system of using space in the physical classroom was considered too dangerous.

The pandemic around the world has changed the landscape of education, especially in the context of Malaysian education. This epidemic has caused all countries worldwide to restructure their strategies for managing emergencies (Zhang, Wang, Yang, and Wang,

2020). Actions and instructions from the Malaysian government in implementing the movement control order were intended to curb the spread of this epidemic from becoming more serious. Indeed, to ensure the students' continued studies, the Ministry of Education Malaysia (MOE) introduced a home learning method using technology in the classroom. The teachers took the initiative to learn the usage of various digital platforms such as Google Classroom, Webex, and others. Nonetheless, the teachers still faced difficulties in preparing quality lesson materials and a lack of experience operating online learning methods. In addition, they also had problems assessing their students' comprehension levels during the online learning sessions. According to Saxena (2020), to ensure that the students and parents can adapt to the new norms in these learning sessions, they needed help to ensure the smooth running of this process.

According to Holley (2002), online learning can link interactions between teachers and students without having to meet face to face. Online learning can be implemented in various ways, such as through digital slideshows, digital graphic information sharing, etc. Online learning has sparked different creative ideas from teachers in ensuring effective knowledge delivery to students. It is an opportunity that the school administration can explore to ensure the smooth running of teaching and learning sessions. The use of technology in teaching and learning is not new, and it was already introduced since time immemorial (Mohamed Noh et al., 2013). To ensure a smooth teaching session, the factors that drive the readiness of teachers to accept the use of technology need to be studied deeper (Aziz et al., 2020). It is supported by Sangeeta and Tandon (2020). They stated that this factor must be addressed as it will contribute to education policy formulation and efforts to promote technology integration in the classroom. Furthermore, the challenge is to ensure the smoothness of teachers transitioning from offline learning to online learning (Ferri et al., 2020). Voogt and Knezek (2008) explained that the teachers' use of technology was influenced by several factors, namely their attitude, competence, and access to technology. Suppose institutions fail to identify the root causes of this issue. In that case, they will also contribute to the difficulties of implementing the process of imparting knowledge to the students by the educators (Aziz et al., 2020). This research was conducted in an effort to understand the associations between institutional support, perceptions of usefulness, personal innovation, perceived social pressure, and age with the application of technology during the closure of educational institutions due to the COVID-19 pandemic.

2.0 Literature Review
To improve one's job, one would use a particular system, and the extent of confidence in using the system is perceived usefulness. According to Davis et al. (1992), the definition of perceived usefulness is the perception of post-usage experience that consumers have on a particular system. As Davis (1989) mentioned, the perceived ease of use means the perception of minimum effort usage in both the consumer's mind and the physical system. That variable from the first Technology Acceptance Model (TAM) used acceptance and usage processes to test the information system's theory. Some studies have recently tested this variable in the education sector regarding the pandemic. Significant results were shown in Aziz et al. (2021), Samuel (2014), Thongmak (2017), and Thanakrit et al. (2019). In addition, Drennan et al. (2005) also mentioned that the preferable factor among other variables that give the most decisive result is perceived usefulness. This situation has been supported by the before-after evaluation on the satisfaction among participants in a particular course that they will become known to reflect them to have perceived the benefits, to help improve the job performance. This statement also was agreed by Xue et al., 2012, which showed that there was a significant result on the perceived usefulness in the adoption of technology.

There are obstacles to achieving maximum utilization of technology by unlocking its true limitless potential by the teachers, which are driven by the institutional and administrative support, preparation and experience, attitude or personality, influences, and resources (Brinkerhoff, 2006). Andoh (2012) stated that the current characteristics of instructors are supported by considerations made institutionally. Experience in technology is another essential factor contributing to how well the teachers can apply technology in their teaching and learning process. The teachers' better skills will determine whether they would use technology in their teaching or not and how much technology will they incorporate. In a comparative case study by Mai and Hong (2014), it was found that teachers in rural areas sought to resolve an issue in their teaching by turning to technology – hence why do they ask for "more access to ICT services and technical support [...]". This finding is an example of integrating ICT into English teaching effectively and supported by the institutions. Due to the nature of technology which changes rapidly, the teachers' expertise in IT will be obsolete if it is not honed continually, which is why the skills in IT and instructions on IT are best to be given over and over again, rather than on a one-time basis. Furthermore, it is on the top managements of schools to fulfill the teachers' needs to be adept in ICT through ICT training programs by forming industry-teacher collaborations (Lau & Sim, 2008).

Personal innovativeness is "the level to which the individual is receptive to new ideas and makes innovation decisions independently of the communicated experience of others" (Midgley, 1977). Personal innovativeness is a personality characteristic that motivates a person's initial desire to try new things, which comes before any teaching experience with technology. In addition, schools consider creative individuals to be the desired group for launching technology adoption and stimulating innovation (Asiri, 2019). In marketing and information systems research, personal innovativeness has been found to control the development of behaviour intention as an individual personality characteristic (Venkatesh, 2000). Exploring the significance of human innovativeness in information technology is a vital area of research

in technology adoption (Fagan et al., 2012). Individuals with a higher level of personal innovation in information technology are more likely to have positive perceptions of the innovation and a higher behavioural desire to use it. Valentina et al. (2019) found that teachers' innovativeness influences their attitudes on using technology in the classroom. However, personal inventiveness is frequently mentioned as predicting technology adoption intentions. However, other researchers have indicated that personal innovativeness does not affect technology adoption intentions for some types of technology (Melián et al., 2019).

Social pressure is another term for social influence. According to Fishbein and Ajzen (1975), social pressure can be quantified by assessing whether a person's behavior is based on whether or not someone important to them thinks they are worthy of completing a task. According to Bruce et al. (1993), teachers' technology adoption can be assisted by creating a collegial environment in which teachers can learn from peers, receive support from their social networks, and collaborate. Referring to AlMarshedi et al. (2017), social pressure can influence a user's attitude toward the adoption of technology, as well as their performance, especially in a collectivist culture. According to Taiwo and Downe (2013), social influence can affect ICT administration employees through the influence of colleagues and senior management, who encourage administrative staff to use ICT by highlighting the benefits and importance of using it before and during the usage of the particular ICT. Users' intentions to employ and adopt ICT are influenced by social pressure. Users may be influenced by social pressure if they observe other people benefiting from ICT tools. Adoption is often connected with characteristics such as user attitudes, perceived utility, and social pressure, according to studies evaluating users' behavioural intentions toward new technology (Chen, 2018). It is backed up by the findings, which show that attitude, perceived usefulness, and perceived social pressure are significant predictors of teachers' intentions to use technology in the classroom, as mentioned by Asiri (2019). Teachers were more at ease and preferred to blend in with their social pressures, especially with expert influence (Andoh, 2012). Teachers should be encouraged by their colleagues to participate in pedagogy training to integrate ICT into the classroom (Mai & Hong, 2014).

According to Rogers E.M (2003), adoption is defined as an individual's decision to use an invention as the best course of action. Rogers E.M (2003) mentioned that adoption begins with the first hearing about innovation and ends with the ultimate adoption. Tandon (2020) stated that implementing online teaching is desirable during COVID-19. It is also vital to establish and raise the educational and training standards available during the pandemic. From another perspective, Mereku et al. (2009) revealed that researchers identified several elements influencing ICT acceptability and integration in the classroom. Neyland (2011) discovered that macro factors like institutional support and micro factors like teacher capacity influence online learning in Sydney high schools.
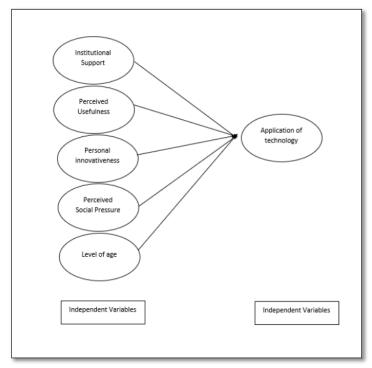

Fig.1: Theoretical framework

Individual disparities in demographics are linked to their diverse behavioural intentions. Age differences have been proven to impact the acceptance of technology significantly. According to Reuter et al. (2010), a person's physical and psychological activity changes as they get older, which impacts the individual's decision-making. Some research has already recognized the value and importance of examining age disparities in technology adoption. From another perspective, Lv et al. (2012) looked at the acceptance of mobile services among three different age groups. They found that there are various factors with varying effects on adoption intention. Li et al. (2016) looked at the mobile privacy-personalization contradiction. Meanwhile, Guo et al. (2015) used PMT and discovered that age influences danger appraisal and coping appraisal elements in m-health acceptance. The effects of perceived vulnerability and severity on attitude are more positive in the elderly than in the youth. Therefore, the acceptance of technology among different ages can be further based on their behavior and decision-making.

3.0 Methodology

This is a descriptive study that used questionnaires to collect the data. The questionnaire was self-managed by the researcher. The study used a 5-point Likert scale (1 = strongly disagree, and 5 = strongly agree). A simple random sampling technique was applied in choosing the potential respondent. The cross-sectional surveys used questionnaires to obtain the required data. A total of 110 respondents encompassing both primary and secondary rural school teachers in Segamat district participated in this study. The researchers observed the distribution process of the questionnaires until they were completed to confirm a high response rate. The data gained from the survey were analyzed using Social Science Statistics Package version 25 (SPSS). In addition, this study also used descriptive statistics as well as Pearson correlation to test and investigate the variables' relationships.

4.0 Findings

4.1 Demographic Analysis

Table 1: Demographic Profile (n = 110)

Demographic		Frequency	Percent
Gender	Male	27	24.5
	Female	83	75.5
Age	21-29 years old	15	13.6
	30-39 years old	24	21.8
	40-49 years old	43	39.1
	50 years and above	28	25.5
Race	Chinese	2	1.8
	Indian	1	0.9
	Malay	107	97.3
Education	Diploma	8	7.3
	Bachelor's degree	92	83.6
	Master	9	8.2
	PhD	1	0.9

A total of 110 respondents participated in this study, mainly females (83; 75.5%), whereas males made up only (27; 24.5%). In terms of age, most of the respondents were above 50 years old (28; 25.5%), and most of them were above 40 years old (43, 39. 1%). Malay teachers made up the majority (107; 97.3), followed by Chinese teachers (2, 1.8%) and Indian teachers (1, 0.9%). Regarding educational background, most teachers are bachelor's degree holders (92 respondents, 83.6%).

4.2 Reliability Analysis

Table 2: Reliability Statistics

Variables	Number of items	Cronbach Alpha
Adoption of technology	5	0.910
Institutional support	6	0.884
Perceived Usefulness	5	0.904
Personal innovativeness	5	0.524
Perceived social pressure	4	0.825

The reliability analysis shows a significant result. The Cronbach's Alpha values from all the tested variables (institutional support, perceived usefulness, personal innovativeness, perceived social pressure, and adoption of technology) fluctuated from .524 to 0. 910. A Cronbach's

alpha value must be greater than 0.70 to be an accepted value (Nunally & Bernstein, 1994). This indicates that all variables are acceptable and valid.

4.3 Correlation Analysis
Table 3 below shows the correlations between all variables, and all the variables were positively and significantly correlated between the variables (p <.01). The values indicate that all variables used in this study had a stable association.

Table 3: Correlation Analysis

Variables		1	2	3	4	5
1.	Institutional Support	-				
2.	Perceived Usefulness	0.711**				
3.	Personal Innovativeness	0.371**	0.467**			
4.	Perceived Social Pressure	0.791**	0.787**	0.446**		
5.	Adoption Technology	0.490**	0.683**	0.460**	0.646**	-

**. Correlation is significant at 0.05 level (2-tailed).

4.4 Multiple Regression Analysis
Table 4 determines the coefficient result between the independent and dependent variables. The Beta score for institutional support is (-0.181), followed by perceived usefulness (0.436), personal innovativeness (0.184), and perceived social pressure (0.396). This indicates that perceived usefulness has the highest impact on technology adoption among the respondent, with its Beta value equaling 0.450.

Table 4: Regression Analysis of Coefficient

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.828	.347		2.386	.019
	Institutional Support	-0.181	.122	**-0.169**	-1.493	.138
	Perceived Usefulness	0.436	.111	0.450	3.927	**.000**
	Personal innovativeness	0.184	.093	0.153	1.995	**.049**
	Perceived Social Pressure	0.396	.144	0.358	2.751	**.007**

a. Dependent Variable: Application of technology

From the result, three variables are the significant predictors of technology adoption, namely perceived usefulness (p=0.00), perceived social pressure (p=0.07), and personal innovativeness (p=0.049). In contrast, institutional support (p=0.115) was the only insignificant predictor of technology adoption among the rural school teachers. The result concluded that perceived usefulness is a factor that primarily influences the adoption of technology among the teachers, with a t-value of 3.927 and a Beta value of 0.436 – the highest among all tested variables.

4.5 Chi-Square Tests
Table 5 determines the Chi-Square for age level and intention to adopt technology in teaching and learning activities among teachers in Segamat district. The Chi-Square result is 33.524, associated with a 7.17% risk. At the 5% level of categories, there is no significant difference in age in technology adoption (p > 0.05). Therefore, hypothesis H1 is not supported since the p-value is > 0.05. This result is also supported in derKaay et al. (2012), who found that the level of technology usage by older and younger generations are similar. Even at some point, some of these younger generations faced some difficulties in technology adoption and some of them considered technology as a minor source of stress.

Table 5: Level of age towards adoption of technology

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.524	39	.717
Likelihood Ratio	34.979	39	.654
Linear-by-Linear Association	0.83	1	.364
N of Valid Cases	110		

a. 1 cells (91.1%) have expected count less than 5. The minimum expected count is .14.

5.0 Discussion
Overall, this study examined the relationships between institutional support, perceptions of usefulness, personal innovation, perceived social pressure, and age with the application of technology among teachers from rural schools in the district of Segamat, Johor. The main finding shows that there is no significant difference between age and the application of technology among teachers from rural schools,

with a Chi-Square value of 133.524, which is associated with a 7.17% risk. The three variables show a significant difference in technology applications: perception of usefulness, personal innovation, and perceived social pressure. The research conducted shows that three variables are the significant predictors of technology adoption that is perceived usefulness (p=0.00), perceived social pressure (p=0.07), and personal innovativeness (p=0.049). The study's findings supported the earlier research by Asiri (2019), whereby attitude, perceived usefulness, and perceived social pressure are essential predictors of teachers' intentions to use technology in the classroom. It also implies that those teachers with positive perceptions of usefulness and social influence tend to use technology during class activities. Fagan et al. (2012) found in their study that personal innovativeness positively impacts the intention to use technology.

6.0 Conclusion & Recommendations

The findings of this study showed only three variables (perceived usefulness, personal innovativeness and perceived social pressure) can be used to predict the application of technology among teachers in rural area school. Training teachers until they become competent in several technology applications, or at least until they can use such software decently, will increase the IT skills of the institutions. This means supports given by the institutions for teachers in the form of trainings indirectly improves the performance of the schools. Moreover, if teachers get used to technology, they will subconsciously utilize it in their teaching as they now have incorporated technology into their daily lives. With this being said, workshops working on IT skills should be held by institutions for the teachers. Teachers should see that technology is the way forward, many miles ahead, to ease the teaching process. In the post-pandemic era, with online and hybrid learning, falling behind in IT carries devastating aftermath. School institutions that cannot accommodate their teachers with the change will have their performance seen in declining trends. However, now that higher learning institutions have adapted themselves to the change, an even greater responsibility befalls these institutions' consistency. As educational technologies and tools evolve into a new definition and relevance daily, school institutions must quickly and rapidly change with the evolution to avoid becoming obsolete. Hence, every institution must realize and address the need for long-term development programs to sharpen its members' IT skills. For further findings and studies, other academic researchers from different areas should measure other factors and variables in technology adoption.

In this study, several limitations can be addressed. Firstly, this study needs to diversity the sample from various respondents. Currently, this research only focuses on a specific area which is Segamat, Johor. Therefore, future studies may focus on several rural schools from other states and districts. In addition, focusing on various age backgrounds is essential to know the skills of teachers in practicing technology during the teaching session.

Acknowledgement

Paper Contribution to Related Field of Study

This research contributes to filling the gap of the existing literatures that are related to the study of School Teacher's Technology Adoption.

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