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The Preferences and Intentions of Terengganu's Teachers Regarding the Use of Emerging Technologies

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Abstract

There has been much discussion about the 21st century being a technology age. Technology, as we know it today, is crucial to our survival. Technology has permeated nearly every industry, and its effects can be seen in classrooms across the globe. Among the many concerns explored in this research is the prevalence of teachers in Malaysia who are embracing the use of technological innovations in the classroom. Education in Malaysia is overseen by the Ministry of Education, which was established after the 2013-2025 Malaysian Education Development Plan (PPPM). This study aims to examine factors associated with teachers' behavioral intention toward adopting new technology. The cross-sectional study and the correlational research design were used to analyze the phenomena in this study. A total of 188 teachers from the eight districts of Terengganu (Besut, Dungun, Hulu Terengganu, Kemaman, Kuala Terengganu, Kuala Nerus, Marang, and Setiu) were included in the study. The results of the study revealed that all the independent variables (performance expectancy, effort expectancy, social influence, and facilitating conditions) are correlated with Terengganu teachers' intention of adopting new technology.

Keywords: Education, Information and Communication Technology (ICT), Teachers, Technology, Teaching and Learning

Introduction

Governments around the world have poured resources into equipping schools with cutting-edge technology and infrastructure and have strongly recommended that schools adopt ICTs and teach using ICTs (OECD, 2019). In this educational system, technology plays a crucial role because it facilitates students' comprehension and retention of material. The incorporation of cutting-edge technologies into everyday scholastic routines is deemed beneficial (Farella et al., 2020; Gomez-Trigueros, 2020). The extent to which information and communication technologies (ICT) are used in any given classroom appears to depend on

several factors, including the quality of available educational software, the level of ICT training received by teachers, the degree of cooperation between educators, and teachers' levels of confidence in their abilities as ICT users (Gil-Flores et al., 2017).

According to Chick et al (2020), rethinking teaching and learning using technology can lead to better results. The approaches taken to education and training should not be stuck in a rut. The needs of today's generation can be met with the help of technology. The Alpha generation is far more advanced than the Y and Z generations in terms of its use of technology. Educators will quickly burn out if they are required to continue using the same methods they have always used in the classroom. Reich's (2020) research backs this idea by claiming that despite the widespread usage of technology in classrooms, educators are still using time-tested methods of instruction that have not been updated to make use of the benefits offered by digital tools.

Information and communications technology (ICT) is the backbone of the educational infrastructure that supports the development of both instructors and students (Rahamat et al., 2017). There has been a dramatic increase in the importance of schools using ICT to support e-learning and broaden participation in the educational system. The use of ICT in schools has been found to have many important benefits, including the promotion of novel pedagogical approaches, the facilitation of student collaboration, and the improvement of both instructors' and students' technological literacy (Christopoulos & Sprangers, 2021). As distance education becomes the norm due to the COVID-19 pandemic, the importance of interactive learning cannot be overstated.

Unwillingness on the part of teachers to embrace technological advancements in education is cited as a major problem in today's classrooms by Razak et al. (2018). Since the COVID-19 pandemic hit the country in 2020, the country's educational system has undergone significant changes. Because of the MCO, many schools had to close, thus educators and students turned to distance learning. The only thing that can help keep classes going while COVID-19 is still circulating is modern technological advancements. Due to the extensive use of technology in education, many researchers and academics have expressed interest in examining the methods employed by teachers to enhance student learning (Mohd Suhaimi & Baharudin, 2021).

Samsudin & Che (2016) argue that by using technology, classrooms may be made more engaging and enjoyable for students and teachers alike. The Malaysian Education Development Plan (PPPM) 2013–2025 (KPM 2013) also emphasizes the value of leveraging ICT to boost Malaysia's educational standards (Kamaruddin, 2020). However, there are problems with the implementation of modern technologies in classrooms in Malaysia (Kamaruddin, 2020). A lack of Internet literacy persists among educators, claims Sumarni (2017). According to Khasiman (2013), other nations have been using virtual learning for far longer than Malaysia. This is in contrast to the United Kingdom, the United States, Ireland, Hong Kong, and Singapore. Teachers' resistance to adopting digital tools persists (Masri & Mahamod, 2020). Teacher access to the internet is a major barrier to the use of ICT in the classroom, especially in rural settings (Abdul Wahab et al., 2020).

Terengganu is no different from other states in its efforts to improve its education system through Educational Transformation, and the state administration has explored many different approaches (Raman et al., 2014). Many top-scoring national exam achievers hail

from the state of Terengganu (Huawei, 2017). Terengganu's government and Huawei Malaysia signed an MoU on November 9 to work together on the State Digital Transformation Roadmap. Using IoT and AI-powered application platforms, the government may roll out digital solutions across many different sectors, including education (Huawei, 2017). The use of digital technology in the classroom, such as a virtual learning environment, is a novel approach to enlarging the learning experience; yet, teachers must recognize that it is essential to integrate the technology properly for it to be effective (Kamaruddin, 2020). Therefore, the purpose of this research is to identify and analyze the factors associated to adopt new technologies among teachers in Terengganu, Malaysia. Ultimately, this study aims to help the government of Terengganu create more effective public policies and initiatives for the state's schools.

Literature Review

Performance Expectancy

An individual's performance expectation is their conviction that new tools will boost output in the workplace (Venkatesh et al., 2003). The Unified Theory of Acceptance and Use of Technology (UTAUT) model frequently includes the concept of "performance expectancy," which predicts behavioral intention when utilizing new technology, as stated by Francisco & Swanson (2018). With the UTAUT paradigm, Sung et al. (2015) investigated mobile learning in South Korea and found that it is strongly correlated with future actions. The UTAUT model has been employed by several academics, and their findings imply a link between performance expectations and intentions to use technology in one's daily life (Almaiah & Al Mulhem, 2019; Nikolopoulou, 2018).

Individuals anticipate improved productivity because they anticipate that IT applications will speed up their ability to carry out routine chores. In their research, Raman et al (2014) found that instructors' performance expectations were significantly correlated with their intentions to change their behavior. Educators value the smart board because they anticipate using it to enhance their classroom practices. Users typically look to predict the degree to which they would benefit from a given technology, hence this is the most significant predictor of Behavioral Intention (BI) for technology use across multiple research (Alotaibi & Wald, 2014; Dwivedi et al., 2019). Physical education was found to be the most influential element in determining whether or not aspiring teachers in Malaysia adopted the usage of digital tools in the classroom (Pullen et al., 2015).

H1: Performance expectancy has a positive association with the behavioral intention to adopt new technologies

Effort Expectancy

A person's effort expectancy is the extent to which they believe the invention is easy to adopt, as stated by Rodrigues et al. (2016). Additionally, UTAUT research such as Jelena & Hong's (2016) defines effort expectation as "the degree of simplicity connected with consumers' usage of technology" (Engotoit et al., 2016). Customers have a more positive impression of a technology's simplicity of use when they employ it (Almarri et al., 2020). Several research has linked effort anticipation with behavioral intentions, and they discovered that effort expectancy could alter users' behavior intentions. Consistent with the yield on m-banking found by Alsheikh & Bojei (2014) in Saudi Arabia, Luarn & Lin (2005) state, "the higher the effort expectancy of the customer, the stronger consumer behavioral intention to utilize e-banking services."

Consumers' intent to utilize e-banking services is positively correlated with their level of expectation about the time and effort required to do so, according to research by (Littler and Melanthiou, 2006). Research by Engotoit et al (2016) found a positive correlation between users' expectations of how much effort using a technological system will take and their intentions to make use of the system. More evidence suggests that behavioral intention to use technological systems is positively related to effort expectancy (Moghavvemi et al., 2013; Nassuora, 2013; Wang & Shih, 2009). One of the major elements that decide whether someone would use new technology is their expectation of how much work it will be (Wang & Yi, 2012). Etinger & Orehovacki (2018); Attuquayefio & Addo (2014) obtained comparable results on effort expectancy, finding that effort expectancy has a substantial link with behavioral intention. Researchers have discovered that effort expectancy has a positive and substantial impact on user intention because it helps people determine how much effort will be required to use a given technology (Magsamen-Conrad et al., 2015; Oliveira et al., 2016; Kim & Lee, 2020).

H2: Effort expectancy has a positive association with the behavioral intention to adopt new technologies.

Social Influence

The extent to which one is influenced by one's peers is a strong indicator of their future behavior (Mei et al., 2017). Some studies have looked at how different social influences, like those of friends, family, colleagues, and peers, might affect how widely accepted a person's behavior is (Shen et al., 2018; Shen et al., 2019; Wu & Chen, 2017). Teachers that engage in conversations with colleagues are more likely to adopt innovative pedagogical tools, as stated by (Jain & Jain, 2021). The findings explained the social influence on behavioral intention to embrace IR4.0 technology, as stated by Ab Jalil et al (2022). The most crucial elements in swaying the behavioral intention to embrace a technology are, as stated by Venkatesh et al (2003); Venkatesh et al (2012), influential people who are willing to offer their thoughts and ideas. Social influences on future behavior have been demonstrated in other research as well (Sangeeta & Tandon, 2020). Indeed, research from various authors, including Rogers (1995), Lu et al (2005); Pavlou & Fygenson (2006), indicates that SI is a significant driver of behavior and intention.

H3: Social influence has a positive association with the behavioral intention to adopt new technologies

Facilitating Conditions

Facilitating conditions are those in which users perceive that the necessary organizational and technological frameworks are in place to make the system usable (Venkatesh et al., 2003). Wong et al (2019) found that favorable conditions for adopting new technologies were a predictor of educators' plans to do so. It was found that a positive correlation exists between facilitating conditions and behavioral intent. According to Etinger & Orehovacki's (2018) research, there is a highly substantial positive correlation between enabling factors and behavioral intent.

However, Huang et al (2020) found no evidence that facilitating settings were useful for predicting future behavior. According to Slade et al (2014), most respondents are not m-payment users and, as a result, are unable to assess whether they possess the resources necessary to utilize mobile payment, meaning that facilitating conditions have a negligible impact on behavioral intention to use m-payment. This is because the degree to which a user

values the quality of a website is seen as a more crucial factor than the presence or absence of conducive conditions. Perceived ease of obtaining materials, information, and help in implementing ICTs in the classroom was used as a proxy for enabling conditions (Kim & Lee, 2020). The following hypothesis can be drawn from these:

H4: Facilitating conditions have a positive association with the behavioral intention to adopt new technologies

Research Methodology

The approach of this study is quantitative, allowing the researchers to verify the hypotheses and discover the answers. This study uses a correlational research design to examine the relationships between the dependent variable (intention to embrace new technologies) and the other variables. A total of 188 Terengganu-area teachers were surveyed for this study. According to the number of independent variables, Green (1999) suggested a sample size of 84 respondents as a minimum. The investigation can be conducted on a larger scale with more reliable results if up to 188 samples are collected. Although probability sampling would have been ideal for this study, non-probability sampling was necessary because it was possible to find a large enough sample of people (teachers) who met the study's criteria for availability, convenience, and representation of the qualities of interest. In this study, we carefully selected our sample to maximize its utility for future studies through the use of a statistical technique called purposeful sampling. Subjects who meet a certain profile were selected by the researcher. For this study, researchers chose twenty to fifty-year-old Terengganu teachers from eight different districts and had them fill out a questionnaire voluntarily. Data were combined and analyzed using Statistical Package for Social Programs (SPSS) Version 26.

Findings

The following five questions are used to gather information on the respondents' demographics, including gender, school, education level, and years of service.

Table 1
Demographic Profile of the Respondents

Profile	N: 188	
	Frequency	Percentage
Gender		
Male	77	41
Female	111	59
District		
Besut	28	14.9
Dungun	18	9.6
Hulu Terengganu	19	10.1
Kemaman	21	11.2
Kuala Nerus	16	8.5
Kuala Terengganu	16	8.5

Marang	23	12.2
Setiu	47	25

Types of School

Primary	78	41.5
Secondary	110	58.5

Level of Education

Diploma	22	11.7
Degree	153	81.4
Master	12	6.4
PhD	1	.5

Years of Service

0-5 years	36	19.1
6-10 years	38	20.2
11-15 years	86	45.7
16 years and above	28	14.9

Descriptive statistics were used to examine the sample's makeup. The participants in this study are Terengganu teachers. The selection of these respondents ensures that the survey will receive responses from people who can be trusted to provide accurate information. In total, 188 questionnaires were sent out for this survey. Respondents were evenly split between males and females (77 males and 111 females are shown in table 1). That is to say, women made up 59% of the responses, while men accounted for 41%. Terengganu has eight districts: Besut, Dungun, Hulu Terengganu, Kemaman, Kuala Nerus, Kuala Terengganu, Marang, and Setiu. With 47 participants, Setiu has the greatest response rate (25 percent) in this analysis. While Kuala Terengganu has the fewest respondents overall with 16, Kuala Nerus has the fewest with 8.5%. Table 1 also depicts that secondary school teachers rank higher than their elementary school counterparts. When asked about their educational background, 81.4% of respondents said they had at least a bachelor's degree, while only 0.5% said they had a doctorate. Most respondents have been educators for 11-15 years, while just 14.9% have been in the profession for more than 16 years.

Reliability Results

Table 2 shows that Cronbach's Alpha value for the variable intention to use new technology was .864 with the number of items (3). Besides that, all independent variables' items in this study are reliable as the Cronbach Alpha values are more than .60.

Table 2

Reliability Test Result

Constructs	No. of Items	α Value
Dependent Variable		
Intention to Adopt New3 Technologies		.864
Independent Variables		
Performance Expectancy	4	.815
Effort Expectancy	4	.867
Social Influence	4	.743
Facilitating Conditions	4	.704

Normality Results

Table 3 shows the normality distribution of the data used in this study. Skewness and kurtosis values between -2 and 2 are acceptable for confirming a normal univariate distribution (George & Mallery, 2010). The dependent variable construct is between -2 and 2, with skewness = -.320 and kurtosis = -1.273 being the highest in the normality test result. The independent variables Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) all have values between -2 and 2. The normality test indicates that all the independent and dependent variables have values less than 2, indicating they are all normal. According to the table, the skewness and kurtosis measurements are normal because they did not exceed 2.

Table 3

Normality Test Result

Constructs	Mean	Standard Deviation	Skewness	Kurtosis
Dependent Variable				
Intention to Adopt New Technologies	2.9645	1.10470	-.320	-1.273
Independent Variables				
Performance Expectancy	2.8564	.62211	-.319	-1.015
Effort Expectancy	2.7899	1.05833	-.376	-1.228
Social Influence	2.7473	.77735	-.628	-.645
Facilitating Conditions	2.3830	.60491	-.426	-.329

Correlational Results of the Study

Table 4 shows the relationship between performance expectancy and intention to use new technology. The p-value is .000, which is less than .05. It indicates a relationship between performance expectancy and intention to adopt new technology. The r value is .422 and indicates a moderate relationship between performance expectancy and intention to adopt technologies. Besides that, this study also found that the relationship between performance expectancy and intention to adopt new technologies is positive since the r-value is positive. Therefore, H1 is accepted. Effort expectancy also has a positive relationship with the intention to adopt new technologies. The correlation analysis results revealed an r-value is .421 and showed a moderate relationship between effort expectancy and intention to adopt new technologies. Since the r-value is positive, this study discovered a positive relationship between effort expectancy and intention to adopt new technologies. Therefore, H2 is accepted. This study also found that there is a positive relationship between social influence and the intention to adopt new technologies. This study also found that the relationship between social influence and intention to adopt new technologies is positive since the r-value is positive. Therefore, H3 is accepted. Facilitating conditions were also found to be correlated to adopting new technology. The correlation analysis results indicate the r-value is .281 and establish a weak relationship between facilitating conditions and intention to adopt new technologies. Therefore, H4 is accepted.

Table 4

Correlation Results of the Study

		The intention of Adopting New Technology
Performance Expectancy	Pearson Correlation	.422**
	Sig.	.000
	N	188
Effort Expectancy	Pearson Correlation	.421**
	Sig.	.000
	N	188
Social Influence	Pearson Correlation	.261**
	Sig.	.000
	N	188
Facilitating Conditions	Pearson Correlation	.281**
	Sig.	.000
	N	188

Discussion

The study found that performance expectancy is correlated with teachers' intention to adopt new technology. This suggests that teachers in Terengganu have higher performance expectations, and hence are more likely to act on their plans to incorporate IT in the classroom. Consistent with the findings of Raman et al (2014), who found that teachers' performance expectations and their behavioral intentions regarding the adoption of new Smart Board technology were significantly correlated. In addition, the study found that

teachers are more likely to embrace the use of smart boards if they believe that such tools will increase their ability to educate their students.

As Kim and Lee (2020) found, people who have come to recognize the benefits to be acquired through the use of ICTs have come to attach such benefits to ICTs use, which means that people's performance expectations are correlated with their behavioral intentions to utilize ICTs. Thus, this suggests that policymakers and practitioners are prone to center their attention on the benefits of ICTs, or what can be achieved by employing such technology. Thus, it is crucial to stress and illustrates the benefits and advantages of ICT-based instruction in the context of accepting and adopting it. Similar findings were found in another Pakistani study (Commer et al., 2018), which likewise employed performance expectations to predict mobile commerce and collected data from 320 respondents. The findings of this study reveal that performance expectations have a positive relationship with consumer behavioral intentions in mobile commerce.

The findings of the study indicated that there is a positive relationship between effort expectancy and teachers' intention of adopting new technology. This demonstrates that teachers in Terengganu have a positive expectation that their students will attempt to accept new technology. This study's findings are in line with those of Engotoit et al (2016), who also discovered a positive correlation between effort expectancy and behavioral intentions when it came to utilizing the MBCTsl technology platform. It is easy for students to apply what they have learned, so they are more likely to put what they have learned to use. According to Kim & Lee (2020), a favorable influence of effort expectancy on teachers' behavioral intentions to use ICT suggests that educators are more likely to adopt the practice when ICTs are intuitive and simple to employ, freeing them to focus on other priorities. The results highlight the need to ensure ease of use across ICTs devices and systems, which is especially relevant when considering that teachers will vary in terms of their technical competence and experience with the ICTs, even though the importance of effort expectancy decreases throughout usage (Agarwal & Prasad, 1997).

Furthermore, the results are in line with those of a previous study by Alharbi et al. (2014), who found a positive and substantial association between effort expectancy and behavioral intention to utilize mobile learning systems. The findings imply that a student's desire to adopt and make use of the system rises in line with their level of effort anticipation as regards the system. According to research conducted by Balaid et al (2013), there is a robust positive correlation between effort expectancy and behavioral intention. Researchers in information systems, including Kaliisa et al (2017), have found that effort expectancy and behavioral intentions are related in the context of contemporary technology.

The Pearson correlation analysis also found that social influence is associated with teachers' behavioral intention of adopting new technology. Teachers enjoy ICT use because their positive attitudes and actions can have a ripple effect on their peers, pupils, and community (Kim & Lee, 2020). The Asia-Pacific Ministerial Forum on ICT in Education 2017 agrees with this position, urging its member states to create learning spaces and communities of practice to help educators collaborate and spread new ideas (UNESCO, 2018). Mousa Jaradat & Al Rababaa (2013) discovered a correlation between friends' recommendations and future m-commerce behavior in Jordan. This shows how the actions of others might affect educators' plans to implement technology. The collectivist Asian society, Zhao et al (2021)

found, places a premium on the opinions of others when deciding whether or not to adopt new technologies.

Besides that, Faisal et al (2018) found that students' social networks have a significant impact on their propensity to adopt mobile learning systems. This social impact is two-fold, coming first from the peers of the individual student and then from the lecturer. Furthermore, this finding is consistent with those of other investigations. Prior research by Huang & Qin (2011) on Chinese consumers who intended to use a virtual fitting room indicated a favorable correlation between social influence and behavior intention. Besides that, Wu et al (2012) found a favorable correlation between social influence and behavioral intention in their survey of Taiwanese passengers' use of I-Passes.

This study also found that there is a relationship between facilitating conditions and teachers' intention of adopting new technology. This finding accords with the literature that found favorable conditions to significantly and positively correlated with behavioral intent to adopt massive open online courses (Tseng et al., 2019). When considering how conducive settings influence educators' behavior intentions concerning both MOOCs, this study's findings become even more relevant. Practitioners have a responsibility to equip educators to make effective use of massive open online courses (MOOCs). These findings corroborate the initial hypothesis of the UTAUT model and the work of Wong et al (2019), who found that conducive environments predict teachers' willingness to employ advanced technology. This research is consistent with that of Liebenberg (2018), who found that favorable conditions have a statistically significant correlation with the intent to adopt new technologies. To use technology effectively in a classroom setting, students in this study needed to feel that they would receive support from the organizations involved. This was especially true of the technical group that had been established to aid in such endeavors.

Conclusion

The objective of the study is to examine factors associated to adopt new technologies among teachers in Terengganu, Malaysia. This study revealed that performance expectancy, effort expectancy, social influence, and facilitating conditions are positively correlated with teachers' intention to adopt new technologies in Terengganu, Malaysia. The findings of the study are useful for several parties, especially among teachers, the government, school administrators as well as students. The government can learn, in a roundabout way, what is preventing schools and teachers from adopting new technologies. To ensure that educators in Malaysia, and particularly in Terengganu, recognize the value of technology and do not become stuck in the past, it is advised that the government take the necessary measures to raise awareness and the necessity of employing technology today. Governments also need to do more to increase internet capacity so that schools can better persuade teachers to embrace new technology. As part of efforts to close the "digital gap," rural schools need to be given special attention. Those in charge of educational institutions should help teachers adopt and utilize cutting-edge technological tools. Teachers need to be educated on the benefits of employing modern technologies in the classroom. The study's shortcomings were also reviewed, along with recommendations for future research to help circumvent those constraints. After years of research, researchers in Terengganu have finally figured out what motivates educators there to embrace cutting-edge tools in the classroom. The outcome should be advantageous for the relevant groups.

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