Teachers' acceptance level in using technology in the classroom

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Abstract

The success rate on implementation of ICT in the education system is pre-determined by the school teachers' acceptance in applying technology in the teaching and learning process. It is important to find out the readiness of the drivers of ICT usage at schools to ensure successful transformation in implementing the ICT policy in the Malaysian education system. Thus, the aim of the present research was to find out the readiness level of the government school teachers in integrating technology in teaching. A quantitative research design was employed in responding to the research questions. Data were randomly collected from 50 student teachers who teach at schools in Kuala Lumpur and Klang Valley, Malaysia. A questionnaire survey was used to collect data pertinent to the Technology Acceptance Model (TAM) containing questions related to demographic profile and Likert scale measuring variables on Behavior Intention (BI) and Behavior Usage (BU) and Perceived Ease of Use (PEOU). The SPSS findings for this research demonstrated a significant relationship between PU, BU and PEOU. Recommendations such as trainings to be provided and digitised materials to be designed have been emphasised. This research contributes to e-learning literature, as well as to content developers. Furthermore, the research also has shed light onto many opportunities for future research.

Keywords*: Technology Acceptance Model (TAM), Behavior Intention (BI), Behavior Usage (BU), Perceived Ease of Use (PEOU)*

Introduction

With the advent of technology, change is so conspicuous and abrupt in the realm of education. The teaching and learning processes have been redefined due to the influence and value of technology which has become immense in andragogy. The reciprocal relationship that technology has with education has led educators to comprehend and leverage it in the classroom. Many policy makers embed elements of technology in curriculum planning, intentionally to connect students with outside world. Education conserves the potential energy for a radical transformation to bridge the demands of the outside world. Educators have long ago started embedding technological tools in formal education based on how the world approaches socialization, interaction and connectivity. However, the undeniable fact is that technology-supported teaching differs from one country to another.

In Malaysia, the introduction of computers in primary and secondary education differs in terms of location. Malaysia's effort to provide quality education is a multifaceted process. As part of efforts to introduce e-learning, in 1997, the Malaysian Smart School project was launched with the intention to produce productivity-driven citizens who are technologically literate. This project was set as the catalyst for massive transformation in Malaysia's national curriculum. The concept of Smart School involves appropriate combinations of learning styles to foster interactive classroom environment. Classrooms are equipped with multimedia courseware, presentation facilities and groupware to enhance collaborative learning skills. By 2003, the government spent approximately USD285,000 to create 1,494 courseware titles (Bismillah Khatoon, 2007). In terms of learning resources, the learners have access to a database centre to explore various multimedia courseware to facilitate learning. The Smart Schools are also

equipped with advanced computer laboratories which have readily accessible multimedia and audiovisual equipment. Generally, the Smart School subscribes to the constructivist learning approach that encourages the learners to actively construct knowledge; providing the teachers formulate the right learning environment.

Teachers often face challenges due to continual changes in policies. As technology grows in the realm of education, teachers' role also changes to suit the new climate. Integration of technology in the curriculum does not have a linear relationship with the outcome (Florian-Gaviria, Glahn & Fabregat, 2013). In other words, the benefit of the new idea can be attained only if the teachers know how to approach the innovative idea technically and pedagogically. This imperatively spells out that technology is not automatic, but requires the facilitation of an instructor. Many educational institutions have invested a lot of money with predetermined positive outcomes that learning quality will ascend with the introduction of sophisticated technology. However, there is a great misconception as teachers are the driving force behind any innovative ideas related to curriculum. The absence of teachers' involvement at the preamble stage of any fresh attempts to renew the curriculum may result in failure (Oloruntegbe, 2011). An understanding of teachers' acceptance toward usage of technology is important to determine usage behaviors in order to proactively advocate technology in classroom.

The Technology Acceptance Model (TAM) developed by Davis, 1989, is widely used to predict users' acceptance behaviour. The purpose behind its wide usage is due to its simplicity and strength (Venkatesh & Bala, 2008). TAM believes that the success of a system can be predicted by user acceptance of the proposed system and this can be measured by three factors: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and attitude towards usage (ATU) of the system (Davis, 1989). Besides TAM, the Theory of Reasoned Action (TRA) (Fishbein, 2008), the Theory of Planned Behaviour (TPB) (George, 2004) and Innovation Diffusion Theory (Ritu Agarwal & Jayesh Prasad, 1997) are also widely used in studying user acceptance. The mentioned theories will be dealt with in detail at a later stage in the present study. Previous research indicates that elements of technology have been hindered despite large investments due to limited user acceptance.

Purpose of the study

The general purpose of this study was to find out the Malaysian school teachers' acceptance level of the integration of technology in the classroom. The following encapsulates the specific aims of the present research.

1. To find out the government school teachers' intention in using technology in classroom *(Behavior Intention, BI)*
2. To investigate to what extent the government school teachers believe that technology can improve their performance *(Perceived Usefulness, PU)*
3. To study if technology is seen as a factor that may reduce the effort of school teachers *(Perceived Ease of Use)*

The significance of this research is to enlighten the policy makers on the implementation of ICT policy in Malaysia. The findings of the research can shed light into the next course of action to be considered in effectively implementing the ICT policy. Furthermore, course coordinators from Education faculties can also gain some insights in terms of module designing. Courses offered at the teachers' training colleges and Education faculties should meet the demand of today's education industry.

Literature Review

ICT Policy in Malaysian Education

Malaysia as a rapidly developing country has considered education as an important element in the growth of the country. In line with the priority given to the education sector, the Ministry of Education (MOE) has decided to instill ICT elements in the school curriculum. The ICT policy started off with the introduction of The Smart School. As mentioned earlier, the Smart School is a learning institution that is governed by the use of technology. The implementation of the Smart School has been divided into four phases which are known as Wave 1, Wave 2, Wave 3 and Wave 4.

Wave 1 (1999-2002), constitutes the pilot test stage whereby 88 schools were selected to be transformed as Smart Schools. After that, was the post-pilot phase, which represented Wave 2 (2003-2005). At this phase, the concentration was on the building of computer laboratories, teaching of science and Mathemathics in English and development of courseware. Under Wave 3 (2006-2010), great effort was made in turning all schools into Smart Schools. Lastly, under Wave 4 (2010-2020), the Smart School leapt into a stage where the application of ICT elements in education becomes insidious. At this phase, technology becomes an integral part of the pedagogical implications.

Now, the national curriculum focuses on digital age proficiency and technology awareness that intends to produce productive workforce. Currently, the workforce has infused elements of ICT widely that even general workers are expected to possess some knowledge of ICT. Hence, the pedagogy at school is expected to include ICT tools at an optimum level. Delivery of knowledge with the aid of ICT tools requires IT savvy workforce at schools. Failure in training the teachers on how to use the ICT tools or understanding teachers' acceptance towards the implementation of the ICT policy can result in failure of achieving the tangible outcomes.

Theoretical Models in Technology Acceptance and Usage; Theory of Reasoned Action (TRA)

Theory of Reasoned Action (TRA) is a widely studied model by Ajzen and Fishbein from social psychology perspective to examine individuals' consciously intended behavior (Fishbein, 2008). Three core elements of TRA are *attitude* (A), *behavioral intention* (BI) and *subjective norm* (SN). Attitude submits to an individual's belief about the impact of intention to perform a behavior, whereas BI is the individual's strength and voluntariness to perform the behavior (Fishbein & Ajzen, 1975). SN on the other hand refers to the individual's elaborative thought on others' perception (Hsu, 2012). This social influence includes expectations of friends, family and other members in the society who controls the performance of the recommended planned behaviour. TRA believes that an individual's attitude to perform a behavior is volatious and influenced by other referents that determine the acceptance and rejection in terms of intention ($BI = A + SN$). To summarise the definition into simple logic: if a person intends to perform a behavior, then there is a high probability that the individual will do it. However, it can be inferred that attitude and norm may not be weighted equally as both the variables can have different effects in an individual; ($A \neq SN$). This equation is sensible because an individual who is less attenuated by others' perception will implicate reduced weight for SN.

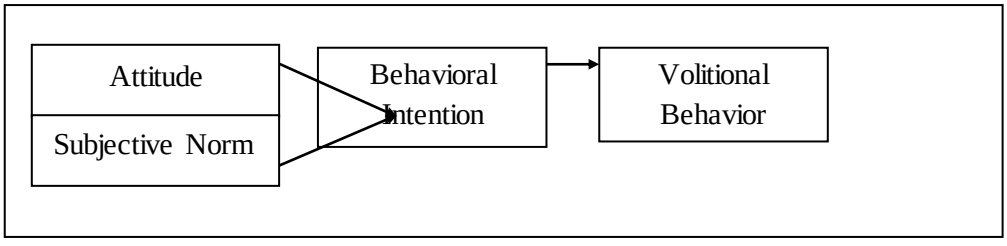


Figure 1: Causal Diagram of Basic Components of the Theory of Reasoned Action, Source: Madden et al. (1992, p.4)

Figure 1 translates the equation into a causal model that posits volitional behaviors as the direct influencing factor of behavioral intentions that modify both attitudes and subjective norms. The target points suggest that performance of volitional behavior could be embraced by aiming at intentions, attitudes or subjective norms. For example, a persuasive message could aim to prevent people from smoking, influence people's attitude towards smoking and shed lights about how others perceive smokers, or some combinations of these three elements.

In a nutshell, TRA suggests that usage behavior is determined by the individual's intention and also concerned with the likelihood of others. The predictor could also be a cross product of both the individual and society as TRA does not specify the beliefs that are operative for a particular behavior. It is also important to understand that TRA succumbs to prediction, rather than outcome of behaviors. Intention can be seen as the cognitive representation of an individual's preparedness to perform the expected behavior. A common understanding in TRA is, the greater the attitude and the subjective norm are, the stronger should be the individual's preference in performing the behavior. For accuracy in making the prediction, the interval between the measure of behavior and observation of behavior should be quite short as intentions change over time.

The contention of TRA is the ambiguity between norms and attitudes because attitudes can also be related to norms and vice versa. Besides that, intention cannot be seen as the sole variable that influences performance of behavior as it is governed by limitations like ability, time, and organisational limit, environmental and unconscious habit. In other words, TRA is only successful in a condition where volitional control is high. To resolve this limitation, the Theory of Planned Behavior (TPB) was introduced.

Theory of Planned Behaviour (TPB)

TPB was proposed by Icek Ajzen in 1985 as an extension of TRA which was conceptualized by Ajzen and his collaborator, Martin Fishbein. TPB is a widely studied model from a social psychology perspective to evaluate a newly introduced component which is "perceived behavioral control" that consorts non-volitional behaviors in the prediction of behavioral intention and actual behavior. In brief, TRA consolidates three elements: beliefs about the significance of the behavior (behavioral beliefs), beliefs about the normative expectations of others (normative beliefs) and beliefs about the presence of variables that may motivate or impede performance of the behavior (control beliefs). In their respective components, behavioral beliefs produce a supportive or *unsupportive attitude* toward the behavior; normative beliefs influence perceived social pressure (*subjective norm*); and control beliefs give rise to *perceived behavioral control* (Hsu, 2012). In its simplest form, TPB can be represented by the following equation.

$$BI = (W_1)AB[(b)+(e)] + (W_2)SN[(n)+(m)] + (W_3)PBC[(c) + (p)]$$

BI: Behavioral intention; *AB*: Attitude toward behavior; *(b)*: the strength of each belief; *(e)*: the evaluation of the outcome or attribute; *SN*: Subjective norms; *(n)*: the strength of each normative belief; *(m)*: the motivation to comply with the referent; *PBC*: Perceived Behavioral Control; *(c)*: the strength of each control belief; *(p)*: the perceived power of the control factor; *W*: empirically derived weight/coefficient

The equation clearly delineates that BI is a joint function of several correlated conditions; the greater the intentions and subjective norm, the higher the probability of performing the intended behavior. In addition to it, the presence of actual behavioral control that refers to support and opportunities available in performing the behavior will also dictate the likelihood of behavioral achievement. Perceived behavioral control posits as a pivotal component in TPB. According to Montano & Kasprzyk (2002), *perceived behavioral control* is related to Bandura's self efficacy concept.

Self-efficacy Theory (SET)

Bandura proposed SET in 1977, which has similarity with *perceived behavioral control*. Self-efficacy explains that an individual is able to accomplish the targeted result if there is adequate *outcome expectancy* (Bandura, 1993). *Self* refers to the individual characteristics while *efficacy* is defined as the power to generate an impact (Merriam-Webster's Online Dictionary). The combined meaning of these two words implies human's consciousness in producing productivity. On the other hand, *outcome expectancy* refers to an individual's confidence in attaining the outcome if adequate support and motivation are provided (Bandura, 1997). In short, SET believes that an individual's expected performance is influenced by internal forces such as self decision making and efforts, and at the same time, controlled by other variables such as fate and luck. Utilisation of cognitive and affective attributes is important in achieving the desired goal, which is often associated with internal locus of control.

Individuals with high level of efficacy tend to ambitiously set higher goals to face challenges, thus Bandura argues that human behavior is governed by cognized goals (Bandura, 1989). Potential negative repercussions are often disregarded as the aim is to achieve the desired outcome. This implies that individuals with high self-efficacy will endeavor to accomplish those goals. In terms of affective factor, the emotional reactions determine the predicted performance of behavior. Every individual exhibits different degrees of ability in handling stress in a challenging situation. Individuals who believe in being able to manage stress can lower their anxiety and exercise control over behavior. On the other hand, the internal locus of control refers to an individual's belief in being able to perform a task. According to Bandura (1997), a high level of self-efficacy in an individual will lead to utilization of cognitive and affective processes. Besides that, social experiences too determine self-efficacy. For example, an individual who has gained adequate skills and experience relevant to the expected performing task will produce a higher level of efficacy. In contrast, an individual who has experienced failure in retrospective with the accomplishment of the task will exhibit a low level of self-efficacy. In short, confidence can be perceived as a prerequisite to try a new task.

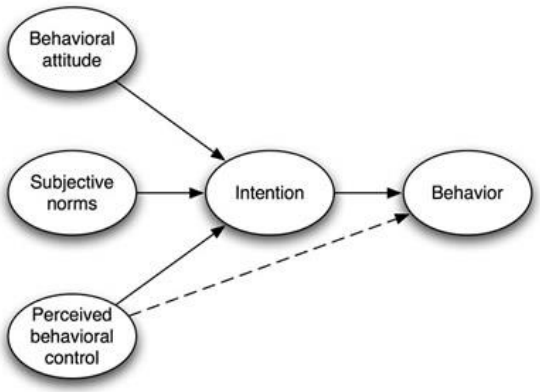


Figure 2: Theory of Planned Behavior Model, Source: Ajzen (1991), p. 182

Even Figure 2 encapsulates that *Intention* is the nucleus in TPB. Intention portrays an individual's motivational force to perform the intended behavior. Motivational actions are self-determined and can be wholly volitionally as it is one's sense of self (Ryan, Richard & Deci, 2000), whereas actions can be influenced by various factors such as persuasion by some interpersonal force. In other words, a person can perceive the locus of causality as internal where behavior is self-determined, or it can also be considered external, whereby behavior is controlled. The important point here is that either it is self-determined behavior or controlled behavior, both attributes postulate energisation issues that address motivation to perform a given behavior. The general rule is, the stronger the intention, the more likely that an individual will perform the behavior. Besides Intention, behavioral attitude too determines one's motivation or ability to perform a task (Khlood, 2010). As mentioned earlier, behavioral attitude is concerned with one's perception of the level of difficulty of performing a behavior which is influenced by some facilitating factors. The facilitating factors are being referred to as opportunity that has an effect on the performing behavior of an individual.

In addition to that, subjective norm which considers the customary codes of behavior of other people too manipulates the behavior of an individual. It simply means that approval from significant people of the behavior will likely ensure that an individual will perform the behavior.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most widely used models to investigate an individual's attitude towards technology. TAM was adapted by Davis from the TRA model (see Figure 1) in 1986. TRA's two significant tenets are subjective norm and attitude towards that behavior, whereas TAM posits two key areas which are perceived usefulness (PU) and perceived ease of usefulness (PEOU). PU is defined as an individual's perception of the significance of the technology in improving job performance. PEOU on the other hand explains an individual's belief in the ability of the technology to reduce effort or workload. Figure 3 illustrates the TAM designed by Davis in 1989.

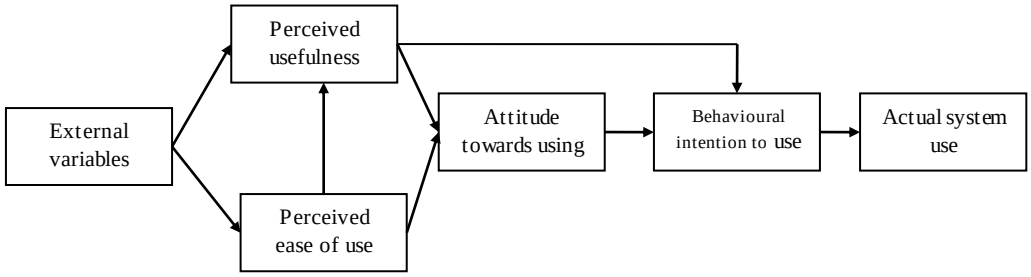


Figure 3: Technology Acceptance Model (Davis et al., 1989, p.985)

The initial stage of TAM, similar to TRA, BI (prediction of behavior performance) was considered. Beliefs of the behavior performance were deduced from the target users for a specific context, and then the belief is weighed by the value determined by the attributed behavior. This idea is criticized by many researchers because TAM could not go beyond measuring perceived ease of use or perceived usefulness variables, and the focus was primarily on volatile attitude. In addition, TAM is also unable to explain the reasons for which an individual would prefer to perform the behavior. At the initial stage, many researchers have agreed that TAM is suitable to study intended behavior in the usage of technology for various contexts. Consequently, many researchers have tried incorporating external factors to the original model and Davis himself has collaborated with Vengkatesh to enhance the model by adding additional

characteristics. This can be seen as an attempt to overcome the limitation of the original model as it did not consider social influences on usage behavior. The following encapsulates the revised model, which is known as TMA 2.

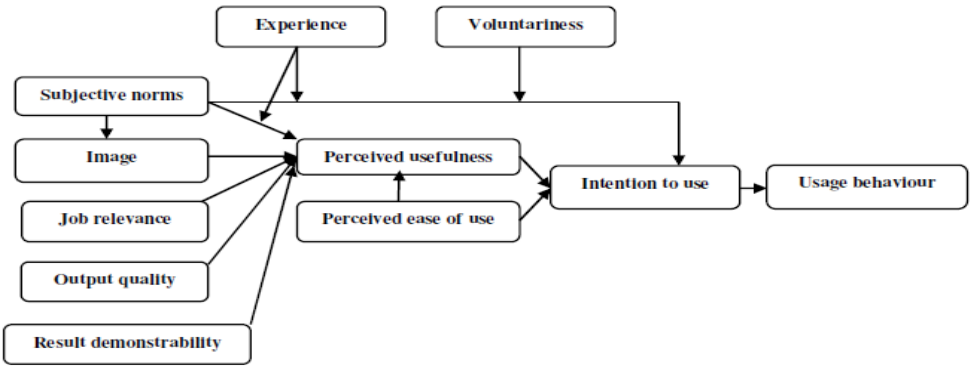


Figure 4: Technology Acceptance Model 2 (Venkatesh & Davis, 2000: 188)

The model above was published in 2000. The additional values in the above revised models include social influence processes (subjective norm, volunteerism and image). In addition to that, aspects pertinent to cognitive instrumental processes such as job relevance, output quality, result demonstrability, and perceived ease of use have been embedded in TMA 2 to enlighten deeper understanding on user acceptance.

As mentioned earlier in the predecessor TAM, the revised model contains *Subjective Norm* (SN) and plays a similar role which is to find out the perception of an individual on the consequences of performing the behavior. *Voluntariness* (V) too inherits the same explanation which is to measure an individual's participation in a non-mandatory situation. Innovations in the new model encompass *Image* (IMG), *Experience* (EXP), *Job Relevance* (JR), *Output Quality* (OQ) and *Result Demonstrability* (RD). Experience (EXP) represents the previous knowledge seized by an individual toward the new system. EXP is proven to be correlated (Vengkatesh et al. 2000) as it has impact on SN, PU and BI. For instance, possession of experience acquired from previous knowledge can foster one's confidence level and increase the quality of being independent. JR explains an individual's perception of the extent to which the target technology is applicable to his or her job. OQ examines the impact of using the target technology in terms of output. RD reflects the formulation of positive perception upon significant outcome achieved when compared between usage and targeted outcome.

Generally, the successor model includes the social factors that were absent in TAM, but, however, did not fill up gaps such as time, organizational, ability and environmental limitations. To overcome the mentioned limitations, Venkatesh and collaborators further expanded the model by developing The Unified Theory of Acceptance and Usage Theory (UTAUT) which has considered 32 variables. The current research however has considered TMA2 as it meets the aims of the research.

Methodology

Given the nature of the question, the researcher analysed the responses collected from the questionnaire using the quantitative strand to synthesise the result.

Sample

The respondents in the current research were undergraduates teaching in public primary schools in Malaysia. The *Teacher Graduate Programme* (known as Program Pensiswazahan Guru-PPG in Malay

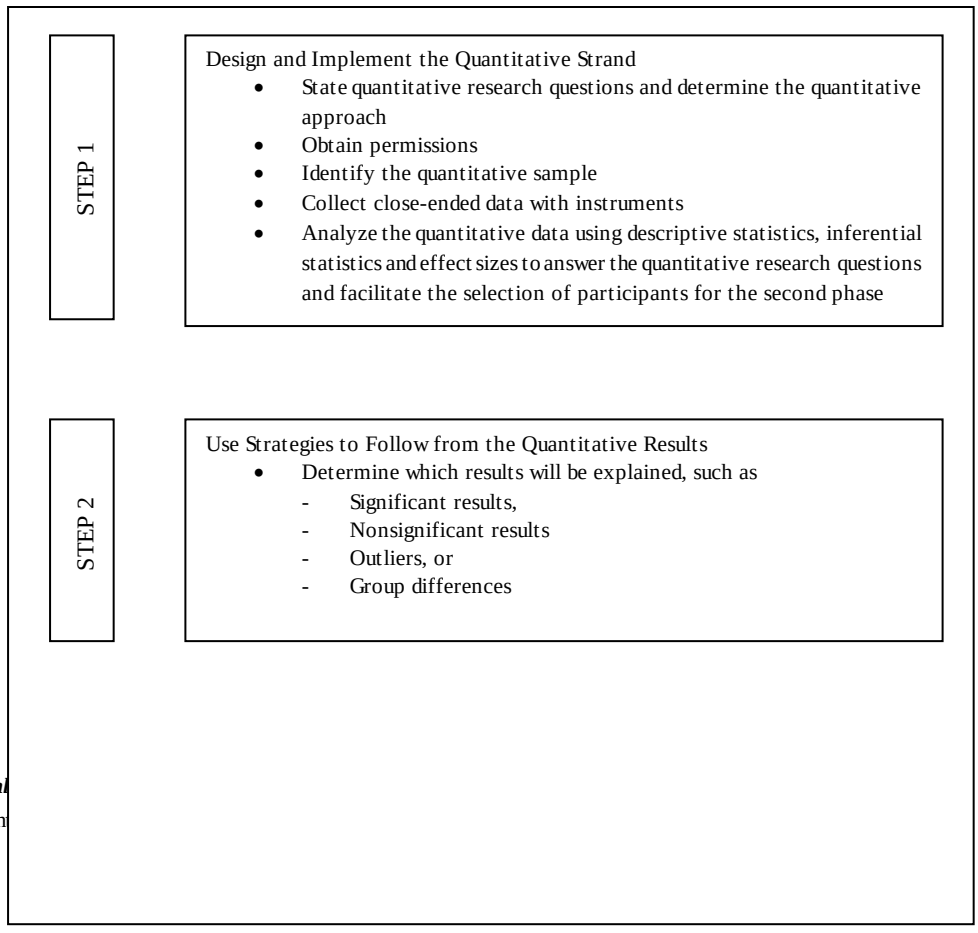
language) was launched under the 10th Malaysia Plan. The Malaysia Plan is the economic developmental plan launched every 5 years by the government to promote the welfare of citizens and especially living conditions in rural areas. In line with that, scholarships were given to public school teachers with Diploma qualifications to elevate their status as Degree holders. The teachers are to enrol as distance learning candidates and participate in face-to-face learning sessions for 10 hours in a semester. This study evaluates 50 valid questionnaire responses from data collected over the period of six months.

Instrument

The quantitative research used an online questionnaire as its data collection method. The questionnaire was derived from the Technology Acceptance Model. The dependant variables (DV) used in the instrument are Perceived Use (PU), Perceived Ease of Use (PEOU) and Self Efficacy (SE). The questionnaire was designed using Google Drive and e-mailed to all the participants of the PPG programme. The acceptance of technology aspects were ranked using a 7-point Likert scale where responses ranged from 1 (least important) to 5 (most important). Out of 67 respondents, valid replies were obtained from only 50 students. The limitations of using questionnaires include honesty of respondents in replying to the questions and the researcher's control over respondents in completing the questionnaire.

Research Design

Creswell (2009) explains quantitative research in its simplest way as analysis of numbers. It simply means collecting numerical data to explain a particular phenomenon that can be answered using quantitative methods. The flowchart (Figure 5.1) provided the guidance for the researcher to conduct the quantitative research. As indicated in the flowchart, the researcher began with the construction of research questions to reflect the need of the quantitative mode of research. Then, permission was obtained from the University to extract a sample from the Faculty of Education. To shape the quantitative strand of the research, a questionnaire was designed as the instrument for data collection and to further analyze the results using inferential statistics. As for steps 2 and 3, results were interpreted based on group differences. The researcher started with tabulating the statistical data obtained by conducting the questionnaire-survey then interpreted the numerical data.



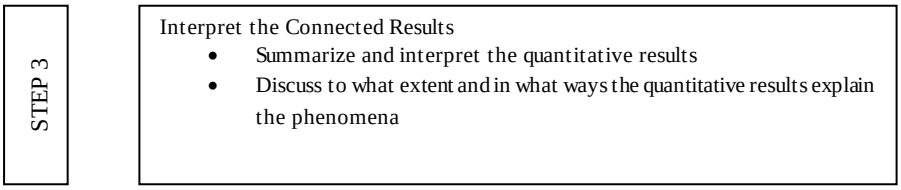


Figure 5: Flowchart of the Basic Procedures in Implementing a Quantitative Research

Results

This section is divided into parts; first it presents the ANOVA statistical findings of the quantitative research and latter discusses data gained from qualitative research design. The intent of this analysis was to specify a variance model of the acceptance of the school teachers towards using technology. The results of the analysis of variance also identify the parameters of interest by ensuring that the ANOVA statistics is congruent with the normal linear regression. To ensure mutual orthogonality, analysis of variance was run multiple times in progression to determine if an additional covariate contributed more to the explained variance. If the additional variate did not reduce the unexplained variance, then there was no necessity to add an additional covariate in the existing model. The table below encapsulates the statistical findings of the acceptance level of the teachers in using technology in the classroom.

Table 1: Factor Analysis of Acceptance on Technology Usage Based on Technology Acceptance Model (TAM)

Strands in TAM	*User Acceptance Criterion*	*Average*	*Factor Loadings*
Behavioral Intention (BI)	Q1 I intend to use technology in the delivery of my lessons	5.02	**0.484**
	Q2 I intend to use technology to enhance my subject matter knowledge	5.44	**0.888**
	Q3 I intend to use technology to enhance my teaching skills	5.4	**0.899**
	Q4 I intend to contact my students via e-mail	5.32	**0.922**
	Q5 I intend to use the Internet for downloading research material for my own research knowlege	5.2	**0.883**
	Q6 Assuming I have access to the Internet, I intend to use it in my homework preparation for class	6.36	**0.735**
	Q7 Assuming I have access to the Internet, I intend to use it in my non-academic tasks with students	4	**0.743**
	Q8 Whenever it will be possible to me, I plan to use the Internet in assessment	2.9	0.18
	Q9 I intend to provide online consultation to my students	4.28	**0.828**
	Q10 I intend to request my students to submit homework online	3.84	0.198
	Q 11 I predict that learning will be more interactive via usage of technology	6.34	**0.495**

	Q 12 I intend to foster interaction via online forum	5.96	**0.788**
Perceived Usefulness (PU)	Q1 Using technology enables me to accomplish my teaching quickly.	5.36	**0.855**
	Q2 Using technology improves the quality of my research.	5.5	**0.892**
	Q3 Using technology enriches my teaching resources	5.56	**0.901**
	Q4 Using technology enhances my research effectiveness for classroom preparation	5.48	**0.886**
	Q5 Using technology gives me greater control over my delivery in class	5.8	**0.78**
	Q6 Use of technology will generally increase my productivity as a teacher	6.6	**0.551**
	Q7 Use of technology will allow more time for revision before examination	5.08	**0.56**
	Q8 Use of technology has the potential to enhance students' performances	5.78	**0.552**
	Q9 Instructions can be understood easily with the presence of technology	6.54	**0.836**
	Q 10 Abstract concepts can be explained clearly with the aid of technology	5.54	0.156
	Q 11 Interactive lessons using technology can make my lessons interesting	6.42	**0.493**
Perceived Ease of Use (PEOU)	Q1 Usage of technology to support my teaching is clear	4.98	**0.718**
	Q2 Obtaining teaching materials can be easy when using technology to support my teaching	5.1	**0.823**
	Q3 Time spent on marking homework scripts can be reduced with the intervention of technology	4.8	**0.660**
	Q4 Time spent on marking exam scripts can be reduced with the intervention of technology	5.16	**0.632**
	Q5 Dissemination of homework is easier with the presence of the Internet	5.3	**0.872**
	Q6 Time spent on face to face feedback can be reduced with the introduction of online feedback systems	5.28	**0.868**
	Q7 Online practices can reduce my effort to prepare additional teaching materials	5.56	**0.548**
	Q8 Monitoring students' performance will be easier if technology is introduced	5.14	**0.762**
	Q9 Remedial classes conducted online can reduce effort	5.06	**0.785**
	Q10 Virtual classrooms can reduce my effort	5.16	**0.825**
	Q11 Online homework submission is easier than the conventional method	5.3	**0.825**

	Q 12 Conducting online assessment is easier than the conventional method	4.5	0.015

Note: Rotated loadings of 0.400 and greater are in boldface and underlined. Ratings of importance were based on a seven-point scale where 7=most accepted and 1=least accepted.

Table 1 encompasses the average and variance scores of the preferences of the teachers in using technology in classroom for the three main strands which are Behavioral Intention (BI), Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). For achieving the objectives of the research, a hypothetical chain relation was proposed:

{H1a: BI --> PU; H1b: BI --> PEOU} {H2a: PEOU --> BI; H2b: PEOU --> PU}
In order to test the acceptance of behavior in using technology, a Rotated Factor Matrix was used to examine if each variable had a substantial loading in a factor. The current study considered substantial loading which is 0.50 or higher as the sample is below than 100. According to Johnson, et al. (2003), if the sample size is below 100, loading above a significance of 0.5 is sufficient. Substantial loading from each component was selected based on its highest value. The outcome of the factor analysis for the present study did not exemplify any complex variables, so there was was no need to eliminate any factor.

The table provides empirical evidence that all the three variables (BI, PU and PEOU) establish a significant relationship. In accordance with previous literature (Bandura, 1992), it is found that the findings are similar whereby the total effect of BI, PU and PEOU has a significant relationship. These findings are relevant to the current context of investigation, which exhibit that an individual will only perceive the performing behavior as useful and believe that it can reduce effort if there is intention to perform the behavior. A possible explanation for these significant results is the TAM itself which suggests that an increased intention to accept a behavior will result in strong direct significance of PU and PEOU.

Using factor loadings as the yardstick, generally for BI the intention to contact students via e-mail had the largest effect on intent to use technology (0.922), followed by preference to use the Internet to augment teaching skills (0.899) and enhance subject matter knowledge (0.888). Besides that, intention to use the Internet for downloading research materials is quite significant (0.883). The respondents are also driven to conduct online consultation to the students (0.828). It also appears that the teachers intend to initiate online forum (0.788), access the Internet to communicate with the students to discuss on non-academic tasks (0.743) and for homework preparation for class (0.735). The significance of predicting that learning will be more interactive with the use of technology also obtained a significant factor loading (0.495) followed by intending to use technology to deliver lessons in the classroom (0.484). The significance of using the Internet for homework submission and assessment received less attention with factor loadings 0.198 and 1.8 respectively.

As for PU, Table 1 presents that 11 out of 12 of the factor loadings have eigen values greater than 4. These findings primarily indicate a high probability of usage intention on the basis of its usefulness among the potential adopters. "Using technology enriches my teaching resources" accounted for 0.901 loading value, then entailed by intention to use technology to improve the quality of research (0.892). The third factor that was extracted corresponds to using technology to enhance effectiveness of research for classroom preparation (0.886). The other two loadings above 0.8 are for performance expectancy to accomplish teaching quickly (0.855) and positive effect of giving instructions via technology (0.836). The only loading above eigenvalue of 0.7 is for the belief that technology could provide greater control in classroom for teachers (0.78). Three components were detected to have an eigenvalue greater than 0.5; belief that more time for revision sessions can be allotted before examination (0.56), overall perception

that technology can enhance performance of students (0.552) and lastly confidence that technology can increase productivity of teachers (0.551). The only factor above the eigenvalue of 0.4 is the certainty that technology can inspire interactive lessons which can excite students (0.493). The only factor with a weak loading was "the belief" that abstract concepts can be explained clearly with the aid of technology" (0.156).

Finally, for PEOU, the findings resulted in 5 out of 12 components with eigenvalue greater than 0.8. The highest factor represents a value of 0.872, suggests that dissemination of homework can reduce teachers' effort. Consistent with this belief, the respondents also predict that online feedback systems can reduce teachers' effort (0.868). Two components with similar factor loadings (0.825) are perceived: effort expectancy on virtual classroom and online homework submission which have great potential in adopting the usage behavior. The respondents also strongly believe that technology can ease their burden in searching for teaching materials (0.823). The three loadings with eigenvalue of above 0.7 are components related to reduction of effort in terms of remedial classes (0.785), monitoring of students performance (0.762) and finally general support obtained in teaching (0.718). Components pertinent to relief from marking homework and feeling of great distress from assessing exam scripts have respectively attained factor loadings of 0.660 and 0.632. The empirical statistics also reveal that the prospective adoptive users believe that online practices can reduce required effort in the preparation of additional teaching materials (0.548). The weakest score for the PEOU strand is the belief that technology can reduce teachers' effort if online assessment is introduced (0.015).

Table 2: ANOVA Output for Behavioral Intention (BI)

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	151.8026	11	13.80024	38.58051	5.14E-45	1.833178
Within Groups	77.26316	216	0.3577			
Total	229.0658	227				

Table 3: ANOVA Output for Perceived Usefulness (PU)

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	48.36364	10	4.836364	11.66308	1.09E-15	1.878767
Within Groups	82.10526	198	0.414673			
Total	130.4689	208				

Table 4: ANOVA Output for Perceived Ease of Use (PEOU)

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F-crit*
Between Groups	33.05263	11	3.004785	4.870315	1.01E-06	1.833178
Within Groups	133.2632	216	0.616959			
Total	166.3158	227				

To ensure the results of calculations is trustworthy, 25 subjects were randomly selected. The overall *F* ratio for the ANOVA output for BI, PU and PEOU are insignificant as the F-ratio for BI is $F(11, 216) = 38.58$ (F) > 1.83 (F^{CV}). Similarly, the hypothesis-testing for PU too does not exhibit a normal distribution as the output is $F(10, 198) = 11.66$, 38.58 (F) > 1.83 (F^{CV}) . Finally, the F ratio for PEOU is $F(11, 216) = 4.87$ (F) > 1.83 (F^{CV}). The null hypotheses for all the three strands are rejected since every group has a mean score of $p \leq \alpha$, which explains that the overall mean score is significantly different from each other. Thus, the alternative hypothesis is:

H_a: At least one mean pressure is not statistically equal

For BI, the variation *betwee*n groups is relatively larger than *within* group. This explains that the mean of the samples is not equally distributed, probably due to its heterogenous sample consisting of females and males from various age groups. As revealed in previous studies (Oloruntegbe, 2011), some females are quite hesitant towards the acceptance of e-learning. On the other hand, males think that e-learning is valuable as it allows more time to perform other tasks to meet life demands. Besides that, a wide range of age group could have contributed to the disparity in the variance. Gen-Y has the capability to understand and apply complicated technical knowledge pertinent to technology. Such ability to cope with new change foreshadows samples from this particular age group to become early adopters of technology. In other words, their perception towards the usage of technology could be higher as compared to respondents who are older. The older generation is proven to be among the last adopters of technology due to high resistance towards changes.

Discussion

Generally, the factor loadings exhibit a consistent varimax rotation score for all the three strands; BI, PU and PEOU. In terms of the average value, each strand represented 5.05 (BI), 5.79 (PU) and 5.11 (PEOU). The average value for PU is the highest then entailed by PEOU and BI. This briefly explains that the expectation of rewards out of performance is greater than the influence of performance on intention or the belief that usage behavior could free one from effort. The variance between the average scores is however steady, indicating significant relationship among the variables. This is contradicting some of the previous studies (Abbasi, Irani & Chandio, 2010). The current study generally hypothesised that BI, PU and PEOU share a quasi-similar total effect on performance of behavior; however to a certain extent, BI and PEOU could be evoked by PU, as an increased perception of usefulness is noticeable.

Behavioral Intention (BI)

In average, respondents scored 5.05 on a 7-point Likert scale. The significance of this score is in contradiction with TAM (Pai & Huang, 2011; Venkatesh, Morris & Ackerman, 2000) that the total effect of BI is greater than PU and PEOU. This is not something unusual as previous studies have obtained similar results (McCoy, Everard & Jones, 2005). Intention explains the disposition to respond positively or negatively towards the usage behavior. In the present study, the respondents appeared to be interested in providing online consultation to students. Providing online consultation to students is not formalized in the education system. The positive response for this aspect could be due to the respondents' acquired experience as candidates in distance learning. Distance learning by its nature operates most the processes virtually, which includes consultation. Thus, the intention of the respondents who are from a traditional background (public school) to provide online consultation to students can be interpreted as a complex amalgam derived from their experience. This socially or cognitively acquired disposition can be seen as a subconcious process that is open to change. In short, the meaningful engagement of the respondents with online consultation could have stimulated the surface attitude towards online consultation to be introduced in the current conservative school setting.

Besides that, the intention to adopt the usage behavior is also noticeable and it could be due to awareness of IT skills. The Ministry of Education in Malaysia has recognized the importance of ICT in schools, thus empowerment of technology in education began in 1999. The integration of technology in curriculum has provided opportunity for teachers at school to acquire ICT skills. It is undeniable that the young generation is demanding it, hence some teachers do take the effort to provide the desired exposure by integrating elements of technology to deliver an interesting lesson. The inspiration from the ICT policy, somewhat has provided school teachers with sufficient ICT knowledge that includes the usage of the

Internet. This could be a significant predictor for adopting technology as the statistics do reflect the teachers' intention to use the Internet to disseminate homework, initiate e-forums and vastly use it as a teaching tool.

The lowest factor loading for BI is the aspect related to assessment. The respondents' degree of conscious intention to perform e-assessment in classroom is generally low. The weak specified future behavior could be due to the current challenges faced by the school teachers with the introduction of School-based assessment. The School-based assessment aspires to evaluate the students throughout the learning process instead of evaluating the students at the end of the year. In this system, teachers will conduct formative assessments in order to make necessary improvements or changes in teaching approach to bridge the gaps among students. Upon conducting the assessments, the teachers are required to key in the marks in the system and this is reported to be a challenging task for the teachers. *The Star* newspaper highlighted that school teachers are facing great difficulties to key in the data (Zuhrin Azam, 2014) in the system. Frequently mentioned complaints are congestion of the system and server issues. The teachers are frequently unable to meet the deadline, so they have to work late at night to key in the marks in the system to escape from the congested system.

Perceived Usefulness (PU)

The average score for PU is 5.79, which is the highest scoring strand. A similar finding was attained by (Khlood, 2010) when investigating the adoption of e-learning by students of Saudi Arabia. The findings of the present study delineate that the respondents perceive the achievement of the usage behavior as extrinsic motivation to integrate technology in classroom. Technology is perceived as a tool to achieve the learning outcomes and make learning become meaningful. The statistical findings exhibit that teachers believe that technology will improve their performance in terms of enriched teaching resources and increased productivity in classroom delivery. Besides that, the teachers also believe that integration of technology will enhance the performance of students.

The majority of the respondents believe that technology can elevate their performance in the classroom. Technology is seen as a mass power that enables the teachers to foster the students' engagement in class. Interactive lessons via technology are seen as an enabler to provide meaningful learning opportunities to students. Most of the young generation are skilled and exposed to variety of technology applications, thus they are able to handle the technological aspect independently. The strong scores attained on the belief that students' performance can be harnessed mirrors the respondents' ready acceptance of technological innovations. Confidence in the ability to achieve learning outcomes can be interpreted to provide the impetus for teachers to plan and prepare teaching materials using technology which includes the Internet. Therefore, it is not surprising that the teachers predict that their performance and productivity can be increased with the presence of technology.

Perceived Ease of Use (PEOU)

Concretely, the statistics reported a significantly positive response that technology can reduce the effort of the prospective behavior performers. There is a remarkable degree of agreement that introduction of technology would reduce teachers' effort for marking homework and exam scripts. This emphasizes a positive attitude towards the introduction of online practices where technology can act as a supplementary tool to enhance the learning process. With the presence of mobile technology especially, students have a great amount of flexibility in terms of time, pace and place of study (Anuratha, 20). Upon completion of the practices, the system will be able to automatically produce the outcome. This concept of autonomous learning is not only helping the students, but also teachers' required effort to assess the assignments. Thus, in the present study, PEOU has strong direct significance with BI and PU as all the three traits somewhat

lead to the connotation that technology can function as a layer of support to the students' learning experience. In addition, e-assessments could also provide similar impact in terms of assessing the end product. This will definitely be a great relief for the teachers as at most of the public schools, classroom sizes are huge with classes sometimes exceeding 40 students.

Moreover, the respondents too prefer providing online consultation to students as it is expected to reduce time spent on face to face sessions. Again this conception could have been formulated from their personal experience as a blended learning candidate. Online feedback systems can be operated personally or collectively. Online chat forums can also be used as a supportive system for feedback to be given. This can be perceived as scaffolding rather than online tutoring and all the participants of the chat forum can gain from the interaction. A system such as this can also lead to the construction of collaborative learning spaces where other members of the forum can contribute to the scaffolding process.

Limitations and directions for future research

The methodology employed in the present study needs to be enhanced. It is important to consider mixed-mode research design as it has the potential to provide greater insights from the respondents' point of view especially on low factorial loadings. Therefore, the research should be replicated by involving a larger sample size for the generalization of the findings. Besides that, future research can also consider conducting a comparative study between student-teachers who are involved in blended learning and practicing teachers to further understand the underlying variables that influence behavior factors. Furthermore, more independent variables should be included for more dynamic findings in gaining insights from the prospective users. A discrepancy was identified in the F-test, but had minimal impact with data as the factor loadings were mostly consistent. To further investigate the weak significance in the F-Test, future research should consider conducting a Manova analysis by studying the correlations between gender and age against preferences.

Conclusion

Despite the limited technological tools in public schools, the potential users of technology have shown a positive interest towards usage behavior. This is a positive sign for transforming education as high significance is identified among BI, PU and PEOU among the respondents. If the teachers who are the enablers of ICT in education themselves are ready, then there is a great potential for enhancing the education system to significantly elevate student outcomes. Besides that, the study also alerts to the need for effort to be taken in manipulating the teachers' perception about e-assessment. Generally, the respondents are hesitant with e-assessment and this has been inferred to be related to the introduction of School-based assessment; however further investigation is required to validate this assumption. In a nutshell, the present study highlights the intention and belief that behavior usage is rewarding and has great value in dealing with an inflexible situation. Thus, the government should consider providing adequate training to enable the outstanding performance of educators.

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