



Development of TVET Teachers' Beliefs about Technology Enriched Instruction through Professional Development Workshops: Application of the Technology Acceptance Model

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DOI: <https://doi.org/10.30880/jtet.2021.13.02.003>

Received 3rd July 2020; Accepted 10th August 2020; Available online 30th June 2021

Abstract: This study explores how Technical and Vocational Teachers' intentions to incorporate technology in teaching and learning are influenced by their beliefs. It is theorised that teachers' beliefs about using technology in their instructions are influenced by teachers' perceptions of technology usefulness, ease of use, and self-efficacy. In the current study, a series of workshops for technology-enriched instructions were mounted for the professional development of technical and vocational teachers. In these workshops, teachers planned, designed and developed 21st century learning activities. Data was collected using a questionnaire, which was distributed to the TVET teacher participants after the completion of the professional development workshops for technology-enriched instruction. The data was subjected to confirmatory factor analysis, and structural equation modelling which were used to analyze the proposed modified Technology Acceptance Model (TAM) model. The modified TAM model proposed that TVET teachers' *intention* to use technology, and their beliefs about *self-efficacy* are directly influenced by their beliefs about *perceived ease of use*, and *perceived usefulness of technology*, and that the variable, *self-efficacy* is a mediator variable to *intention*. It was shown that the proposed modified TAM model is a good fit model to explain the variance in 52% of teachers' beliefs about the self-efficacy, and 40% variance of *intention*. The positive outcome of the technology enriched instruction professional development program is that it provided a common language and skills that overcame some of the TVET teachers' concerns with regards to technology integration in their lessons. This study contributes towards an understanding of the factors that influence TVET teachers' intentions to use technology in teaching and learning through a professional development programme for technology enriched instruction.

Keywords: Perceived behavioral control, teacher attitudes, teacher beliefs, technology acceptance model, 21st century skills

1. Introduction

The call for technology integration in teaching and learning has been made official in the Brunei National System of Education for the 21st century. Although the literatures show evidences of the use of Information and Communication Technology (ICT) in teaching and learning is increasing (Livingstone, 2012), the case of Brunei achieving 'technology integration' is pacing slowly. Nonetheless, as we strive to use more technology, we need to identify teachers' beliefs about their decisions to integrate technology in the classroom (Deng, Chai, Tsai, & Lee, 2014; Ebil, Salleh & Shahrill, 2020). This study provides insights into factors influencing teachers' beliefs in relation to the use of technology in their

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instructions and the prevalent practices of teaching and learning in technical and vocational classrooms. Efforts to promote the development of 21st century skills among students are not new in the context of Technical and Vocational Education and Training (TVET).

In Brunei Darussalam, as in many other countries, various professional development programs for TVET teachers have been implemented to equip teachers with relevant pedagogical skills for 21st century learning designs. However, very few researchers have taken the challenge to investigate the extent to which these programs have been successful in influencing TVET teachers' beliefs about incorporating dimensions of the 21st century in their teaching and learning practices. Understanding these factors may offer insights into why many professional development workshops are ineffective in getting teachers to use newly acquired skills in their daily practices (Cox, 2010).

The current study investigates the factors that influence the TVET teachers' intentions to integrate technology in their teaching. In particular, this study explored how TVET teachers' beliefs influence their intention to use technology as an outcome of a technology-enriched instruction professional development program (Slykhuis & Lee, 2016). TVET can be viewed as an education system that incorporates the acquisition of knowledge and equipping learners with practical skills and work-based experience for occupational fields (Ehlers, Schuwer, & Janssen, 2018). Previous studies have found that teachers in TVET need to be given basic training in computer use, and how best to integrate ICT to effectively achieve students' learning outcomes (Ramadan, Chen, & Hudson, 2018; Yasak & Alias, 2015). Nevertheless, there is paucity in studies that examine how TVET teachers' beliefs may be influenced through professional development for technology integration in the TVET curriculum. With the surging demand for ICT and the need for higher knowledge-based workers, TVET teachers would have to re-evaluate their teaching by incorporating technology and 21st century skills into their curriculum.

There has been a great interest specifically in teachers' beliefs about 21st century teaching and learning, and their beliefs towards technology integration. Teachers' beliefs were found to be related to their technology integration practices (Kim, Kim, Lee, Spector, & DeMeester, 2013; Vongkulluksn, Xie, & Bowman, 2018) and such pedagogical beliefs play an important role in a teacher's decision-making especially when it comes to planning and designing lesson activities (Boschman, McKenney, & Voogt, 2014). Thus, it can be argued that teacher beliefs have a strong impact on how they teach and incorporate technology for the attainment of 21st century skills in a classroom. These beliefs are usually developed through a professional development program that focuses on addressing teachers' sustained skills, personal perceptions, and interest.

As we are living in an ever-changing world, there is a growing need to instil 21st century skills among students. There have been discussions about how schools are not effectively preparing students with 21st century skills through technology integration. Moreover, it appears that basic skills would not be sufficient for students to compete in the current socio-economy. They would have to be capable of solving problems, think critically, be creative, innovative and be able to interact competently with other citizens (Kay & Greenhill, 2011). Today, teachers of primary, secondary and TVET are required to design and develop activities that would promote 21st century skills which in turn, would produce students to be active problem-solvers, team player and digitally literate citizens (Kale & Goh, 2014). In addition, they would need proper training or professional development on how to incorporate 21st century skills into their lessons more meaningfully (Lambert & Gong, 2010; Wood et al., 2017). Duran, Yaussy, & Yaussy (2011) showed positive results from student engagement through collaboration and the use of 21st century skills. Erstad, Eickelmann, & Eichborn (2015) proposed teachers as "agents of change" and in their research, their objective was to reflect on the impact and challenges of those ways. They also recommended that educators would need to create more accessible contemporary frameworks and research on 21st century competencies for teachers. Defining and the implementation of 21st century competencies and skills through technology integration are strategies that most schools are putting great importance on specifically, digital competence, information literacy, or ICT literacy.

Due to this, there has been a lot of research, particularly case studies, on innovative pedagogical practices using ICT (Voogt, Fisser, Pareja Roblin, Tondeur, & van Braak, 2013). Tondeur and colleagues (2017) reviewed 14 qualitative research studies to understand the relationships between teachers' pedagogical beliefs and their educational uses of technology. It was found that there is evidence how this relationship can facilitate the integration of technology in education. Hence, it seems that when it comes to integrating 21st century skills in classrooms, majority of the research focused combining several 21st century skills with the use of ICT. The following paragraphs look at teachers' beliefs about technology in instruction.

One of the 21st century skills that are essential to learners would be digital literacy. Learners need to be able to use digital technology aptly in order to evaluate and create information in this technology-driven world. As there is a demand for integration of ICT in the school curriculum, teachers view this as a challenge to input technology into their lessons (Albion, Tondeur, Forkosh-Baruch, & Peeraer, 2015; Ebil, Salleh & Shahrill, 2020). With ample school support, easy access to technology resources and, teachers' beliefs about technology, these could influence teachers' attitudes towards using technology in their lessons (Voogt & McKenney, 2017). Further evidence show that teachers are likely to use technology meaningfully if it matches their pedagogy (Inan, Lowther, Ross, & Strahl, 2010). In addition, Chien, Wu, & Hsu, (2014) indicated that teachers who usually use technology in their lesson tend to have a more positive outlook towards using it. Though this may be true, the finding may not apply to all teachers because using technology might not be as readily assimilated into teachers' usual teaching (Tondeur et al., 2017). In addition, if teachers possess negative

attitudes toward using emerging technologies, lack understanding on how to use them meaningfully, or are constrained by the limited student or teacher technology access, it is unlikely they will engage these tools in their lessons (Kale & Goh, 2014). Hsu (2016) examined the beliefs, practices and barriers towards technology integration on 152 teachers and discovered that a majority of them possess constructivist pedagogical beliefs because they held high self-efficacy beliefs about technology use. In contrary to this, lack of time to implement technology-integrated lessons, lack of training in the use of technology and lack of technical support were some of the teacher barriers in the use of ICT. In general, there are studies that were research on teachers integrating 21st century skills and using ICT in their classroom, as well as professional development for teachers. However, there has not been a lot of focus towards TVET teachers particularly their beliefs and intentions to the use of technology in TVET teaching and learning.

1.1 Research Problem and Objectives

Teachers often find time as a constraint for designing lessons that specifically address the incorporation of technology and 21st century skills, as the teachers' work may be overwhelming. This study introduced a technology-enriched instruction professional development program to provide a platform for teachers to learn and work together in the design of 21st century lessons that integrate technology. In this way, a technology-enriched instruction professional development program was aimed at addressing the personal, social and perceived control of the teachers' needs so that the program can change teachers' beliefs positively. The overall design of the technology-enriched instruction professional development program included: (1) collaboration among teachers (social factors), and (2) promoting teachers' understanding of the benefits of technology-enriched instruction (personal factor). In addition, the technology-enriched instruction professional development framework, which is a tool for designing and planning lesson activities that develop 21st century skills as well as develop students' higher-order thinking skills and creativity, was used in the professional development program.

The overarching research objective that framed the course of this study is to investigate the factors influencing TVET teachers' use of technology for the development of 21st century skills in TVET students through a technology enriched instruction professional development program. To achieve this objective the following research question is formulated: (1) How do the direct factors of *perceived ease of use*, *perceived usefulness*, influencer variables *students*, *teachers* and *others* relate to teachers' *intention*? (2) How do the direct factors of *perceived ease of use*, *perceived usefulness*, influencers (*students*, *teachers*, and *others*) relate to teachers' belief on *self-efficacy*? and (3) How does the direct factors explain teachers' *intention* to use technology in teaching and learning?

1.2 Theoretical Framework, Hypotheses and Research Questions

The theoretical framework underpinning the current study is the Technology Acceptance Model (TAM) (Davis, 1989), which posits that beliefs about *ease of use*, and *perceived usefulness of technology* influence *attitudes* towards using technology, which in turn influence *intention* to use, and actual *behaviour*. Lai & Bower (2019) reported a systematic review of literature of the evaluation of technology usage in education, and has shown that about 62% of the reviewed journal articles focused on affective elements such as perceptions, intentions or preferences, attitudes, values, beliefs and self-efficacy. Following the tradition of the vast majority of the research on technology use in education, the current study attempts to model the TAM and investigates the direct relationships of the constructs of the TAM model (*perceived usefulness*, and *perceived ease of use*), and influencers (*teachers*, *students* and *other people*) on teachers' *self-efficacy* beliefs, and *intention* to use technology in teaching and learning. Figure 1 shows the original constructs of the TAM model, *viz.* *perceived usefulness*, and *perceived ease of use* are directly related to *behavioural intentions to use*, and indirectly related to *actual system use*. In the modified TAM model, we attempt to investigate how the variable, *self-efficacy*, fits into the TAM model. In the modified TAM model, the variable, *self-efficacy* is placed as mediator variable. It is hypothesised that the variables, *perceived usefulness*, and *perceived ease of use* influence teacher self-efficacy, which motivate their intention and use of technology in teaching and learning.

This current study proposed a modified TAM model, and investigates the research hypotheses that *perceived usefulness*, and *perceived ease of use* have positive direct effect on *intention* and *self-efficacy*; as that *self-efficacy* is a mediator variable. For the purposes of analyses, the modified TAM model was tested statistically using confirmatory factor analysis and structural equation modelling to provide answers to the following research questions: (1) How do the direct factors of *perceived ease of use*, *perceived usefulness*, influencer variables *students*, *teachers* and *others* relate to teachers' *intention*?, (2) How do the direct factors of *perceived ease of use*, *perceived usefulness*, influencers (*students*, *teachers*, and *others*) relate to teachers' belief on *self-efficacy*?; and (3) How does the direct factor explain teachers' *intention* to use technology in teaching and learning?

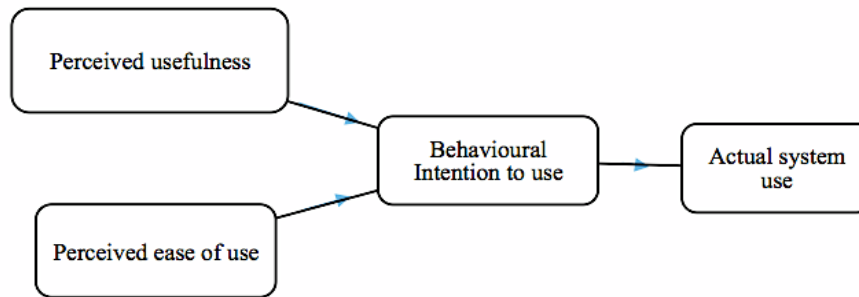


Fig. 1 - The Original Technology Acceptance Model (Davis, 1989)

2. Methodology

This research is a quantitative study that employed a questionnaire for data collection. The questionnaire was administered to a group of TVET teachers who attended the TEI professional development workshops. A total of 115 TVET teachers were involved in the study. The TVET teachers were selected by their respective schools to attend the professional development workshops. The teachers underwent a two-day workshop in designing technology-enriched instructions. At the end of the two-day workshop, they were requested to respond to the questionnaire. Table 1 shows the number of teachers that participated in the workshops from the respective TVET institutions in Brunei Darussalam.

Table 1 - Percentage of participants for professional development workshops

Institution code	Frequency	Cumulative percent
TVET1	14	12.2
TVET2	3	14.8
TVET3	24	35.7
TVET4	15	48.7
TVET5	21	67.0
TVET6	17	81.7
TVET7	21	100
Total	115	100

The participants consisted of 43% TVET teachers who have between 1 to 5 years teaching experience; 44% were TVET teachers who taught between 6 to 20 years, and rest were teachers (13%) who have more than 21 years teaching experience.

2.1 Instrument

The questionnaire comprised a total of 35 items, derived and modified from the constructs of the Technology Acceptance Model. The questionnaire was distributed via online to all participants of the workshop using convenient sampling. A total of 115 teachers completed the questionnaire and the return rate was 100%. The questionnaire was adapted and modified from a previous similar study on eliciting factors influencing secondary teachers’ use of ICT in teaching comprising of teachers’ attitudes, subjective norms and perceived behavioural control (Salleh, 2016, Salleh & Laxman, 2014). Cronbach’s Alpha reliability of the questionnaire is .914.

3. Results and Discussions

Statistical analyses involved confirmatory factor analysis and structural equation modelling. The factor loadings generated from the confirmatory factor analysis for the total sample is presented in Table 2, where all the items reached above the threshold value of .4 were identified and matched for a particular construct. Using SPSS software, the five-factor extraction was requested for the CFA model for the five latent variables, *Perceived Ease of Use (peou2)*, *perceived usefulness (pu2)*, *influencers (student, teachers, others)*, *self-efficacy (selfeff)*, and *Intention (intend2)*.

Table 2 shows the factor loadings of each of the items of the questionnaire for each factors: Factor 1 (*Perceived usefulness*) comprising of items numbers 8,13,17,18, 23,25,27,28,32,33, and 35); Factor 2 (*teacher, students and others as influencers*) comprising of items numbers 9,10,11,19,20,29,30 and 31; Factor 3 (*Perceived Ease of Use*) comprising of item numbers 6,7,16, and 26; Factor 4 (*Self-efficacy*) comprising of item numbers 12,14,24 and 34; and Factor 5 (*Intention*) comprising of item numbers 15, 21, and 22. For items that loads on two factors, decision on choosing the best construct was made by either taking the higher factor loading or by making arbitrary reference to the constructs of TAM. For instance, for items 7, 9, 10 16, 24, and 34, it was decided to choose the factor (or construct) that shows the higher

factor loadings. For instance, item 7 loads on Factor 1 (*perceived usefulness*) and Factor 3 (*Perceived Ease of Use*) with factor loading of .519 and .548 respectively. It was decided to load item 1 on the Factor 3, which shows the higher factor loading. As for the other items (11, 12, and 15), it was decided to arbitrarily select the lower factor loading since the item statements match the chosen factor or construct. For example, item 11 falls on Factor 1 (*perceived usefulness*) and Factor 2 *teachers* (as influencers) with factor loadings of .684 and .421 respectively. However, item 11 fits the description of the construct (Factor 2) of *other* (other people as influencers). Note that items numbers 1 to 5 were not included in Table 2 as they are demographic items.

Table 2 - Confirmatory factor loadings of items on the five-factor model

No.	Item	Factors				
		1	2	3	4	5
6	- I believe that technology for teaching and learning would be easy to use	.385	.038	.711	.258	-.106
7	- I believe that using technology in teaching would improve my delivery of the course	.519	.210	.548	.262	.020
8	- I would like to use technology in teaching and learning for delivery of my course	.711	.181	.348	.085	.115
9	- I think other teachers in my school/college would be in favour for using technology	.411	.490	.394	-.217	.151
10	- I think students would be in favour of utilizing technology	.400	.595	.303	.142	-.067
11	- Most people who are important to me think that it would be fine for me to use tech	.684	.421	.120	.149	.161
12	- I am confident about using technology in teaching and learning	.628	.128	.228	.440	.076
13	- I would be able to actively use technology in teaching and learning	.617	.168	.369	.274	.174
14	- I have a sufficient extent of knowledge to use technology	.123	.135	.312	.754	.047
15	- I predict I would use technology in the teaching and learning	.536	-.033	.316	.241	.464
16	- I believe it would be easy to access course materials using technology	.417	-.045	.469	.104	.418
17	- I believe that technology would allow my teaching and student learning more efficient	.607	.251	.370	.223	.249
18	- Using technology in teaching and learning of my course would be pleasant experience	.660	.197	.277	.160	.142
19	- I think other teachers in my school/college would believe using technology is useful	.360	.477	.315	.043	.292
20	- I think students would believe that technology in teaching is useful	.538	.463	.352	.195	.267
21	- I think other teachers in my school/college would be willing to use	.259	.363	.202	-.068	.662
22	- Using technology in teaching and learning for my courses would challenge me	.075	.164	-.135	.042	.833
23	- I would have more opportunities to create knowledge in my course	.668	.161	.249	.232	.287
24	- I have a sufficient extent of self-confidence to make a decision to utilize technology	.407	.063	.091	.797	.066
25	- I plan to use technology in the teaching and learning of my courses	.820	.120	.145	.114	.185
26	- I believe that technology in teaching and learning would be easy to implement	.110	.330	.672	.339	.080
27	- I believe that using technology would be useful for teaching and learning	.771	.361	.230	.123	.142
28	- Using technology in teaching and learning of my courses is a wise idea	.744	.312	.276	.135	.158
29	- I think other teachers in my school/college would possess adequate skills	.072	.690	.175	.271	.20
30	- I think students would possess adequate skills in using technology	.376	.799	-.113	.099	.159
31	- Most people who are important to me would be in favour in my use of technology	.621	.469	-.044	.175	.157
32	- I would be comfortable to use technology in teaching and learning	.779	.235	.173	.255	.055
33	- I would be able to control the pace of learning in my class	.650	.223	.036	.336	.116
34	- I have a sufficient extent of self-confidence to make decisions to use technology	.465	.206	.163	.731	-.028
35	- I intend to use technology in the teaching and learning of my courses	.746	.248	.154	.270	-.037

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Based on the results of the confirmatory factor analyses, an assessment of the overall structural model using Structural Equation Modelling (SEM) was conducted using AMOS Version 26 software. Figure 2 shows the modified TAM Model 2 (after adjustment). The following research hypotheses were tested using SEM, and the results of hypotheses tests are drawn out to assess the research hypotheses, and ultimately answer the research question.

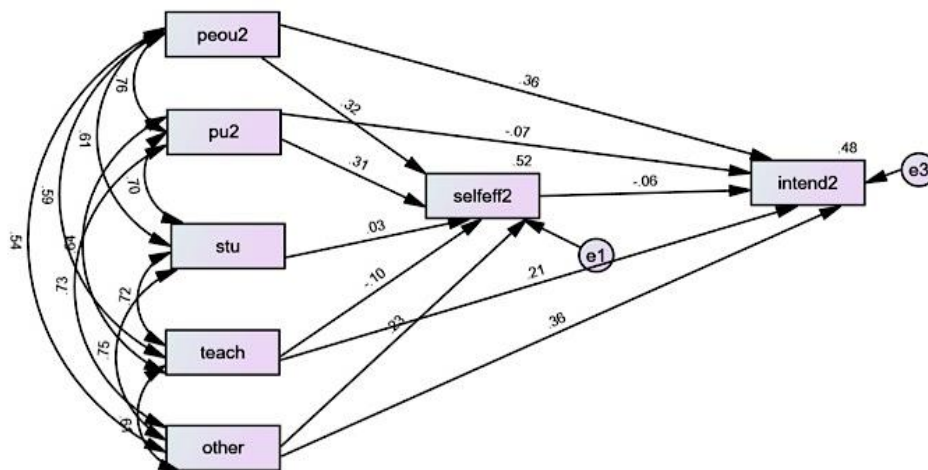


Fig. 2 - Modified TAM Model 2 (after adjustment)

The first research question was: How do the direct factors of *perceived ease of use*, (*peou2*); *perceived usefulness* (*pu2*); *students*, *teacher*, and *others* (as influencers) relate to teachers' *intention* (*intend2*)? The following Table 3 shows the statistically significant path coefficients from *peou2* to *intend2* ($B=.36$; $p=.002$); *teach* ($B=.21$; $p=.038$); and *other* ($B=.36$; $p=.001$) at $p<.05$. Therefore, the following hypotheses formulated to answer the research question were accepted: Hypothesis H1 : There is positive relationship between teachers' belief about *perceived ease of use* and *intention*. Hypothesis H3 : There is positive relationship between teachers' beliefs about *teachers* as influencers and *intention*. Hypothesis H4 : There is positive relationship between teachers' beliefs about *others* as influencers and *intention*. Hypothesis H2 : (There is positive relationship between teachers' beliefs about *self-efficacy* and *intention*) is rejected as the path coefficient from *selfeff2* to *intend2* ($B=-.059$; $p=.564$) is not significant at $p<.05$.

Table 3 - Path Coefficients (B) and Explained Variance (R²) for Direct Factors on Intention

Direct factor	Path	Dependent Variable	B	Significance	R ²
<i>Perceived Ease of Use (peou2)</i>	----->	<i>Intention (intend2)</i>	.36	.002*	.48
<i>Perceived Usefulness (pu2)</i>	----->	<i>Intention (intend2)</i>	-.07	.628	
<i>Teacher (teach)</i>	----->	<i>Intention (intend2)</i>	.21	.038*	
<i>Other People (other)</i>	----->	<i>Intention (intend2)</i>	.36	.001*	
<i>Selfeff2</i>	----->	<i>Intention (intend2)</i>	-.059	.564	
<i>Perceived Ease of Use (peou2)</i>	----->	<i>Selfeff2</i>	.32	.005*	.52
<i>Perceived Usefulness (pu2)</i>	----->	<i>Selfeff2</i>	.31	.019*	
<i>Student (stu)</i>	----->	<i>Selfeff2</i>	.03	.834	
<i>Teacher (teach)</i>	----->	<i>Selfeff2</i>	1.01	.315	
<i>Other influencer (other)</i>	----->	<i>Selfeff2</i>	.23	.045*	

The second research question: How do the direct factors of *perceived ease of use*, (*peou2*); *perceived usefulness* (*pu2*); influencers (*stu*, *teach*, and *other*) relate to teachers' belief on *self-efficacy* (*Selfeff2*)? The following Table 3 shows the statistically significant path coefficients (*B*) from *peou2* to *selfeff2* ($B=.32$; $p=.005$); *pu2* to *selfeff2* ($B=.31$; $p=.019$); and *other* ($B=.23$; $p=.045$) at $p<.05$. Therefore, the following hypotheses formulated to answer the research questions were accepted:

Hypothesis H5 : There is positive relationship between teachers' belief about *perceived ease of use* and *self-efficacy*.
 Hypothesis H6 : There is positive relationship between teachers' beliefs about *perceived usefulness* and *self-efficacy*.
 Hypothesis H9 : There is positive relationship between teachers' beliefs about *others* as influencers and *self-efficacy*
 Hypotheses H7 (There is positive relationship between teachers' beliefs about *teachers* (as influencers) *self-efficacy*.
 H8 (There is positive relationship between teachers' beliefs about *students* (as influencer) and *self-efficacy* are rejected as the path coefficient from *teach* (teacher as influencer) to *self-efficacy*, *selfeff2* ($B = 1.01$; $p=.315$) and from *stu* (students as influencers) to *selfeff2* ($B= .03$, $p=.834$) are not significant at $p<.05$.

Based on the above findings and discussions, the following conclusions can be made to answer the first two research questions. Firstly, teachers' beliefs about their perception of *ease of use of technology*, and their beliefs about *teachers and others* as influencers (people who have significant influence for them to use technology) have direct influence on their *intention* to use technology in teaching and learning. And secondly, teachers' beliefs about their perception of *ease and use of technology*, and *perception of usefulness*; and *others* as influencers have direct effect on their beliefs about *self-efficacy* to use technology in teaching and learning.

Finally, the third research question asks: How does the direct factors explain teachers' *intention* to use technology in teaching and learning? The following Hypothesis H10 was formulated to answer the research question. Hypothesis 10 (The direct factors (*perceived ease of use*, *perceived usefulness*, *teachers*, *students* and *others* as influencers); and *self-efficacy* provides a significant model fit in explaining teacher *intentions* to use of technology in teaching and learning. Hypothesis 10 was tested by assessing the performance of the SEM model of direct factors, by examining the significance of each of path coefficient (*B*); the model fit indices and squared multiple correlations (R^2) of the two dependent variables, self-efficacy and intention. Two modified TAM models (Figure 2 and Figure 3) were generated using AMOS software, and the fit criteria (see Table 4) were compared.

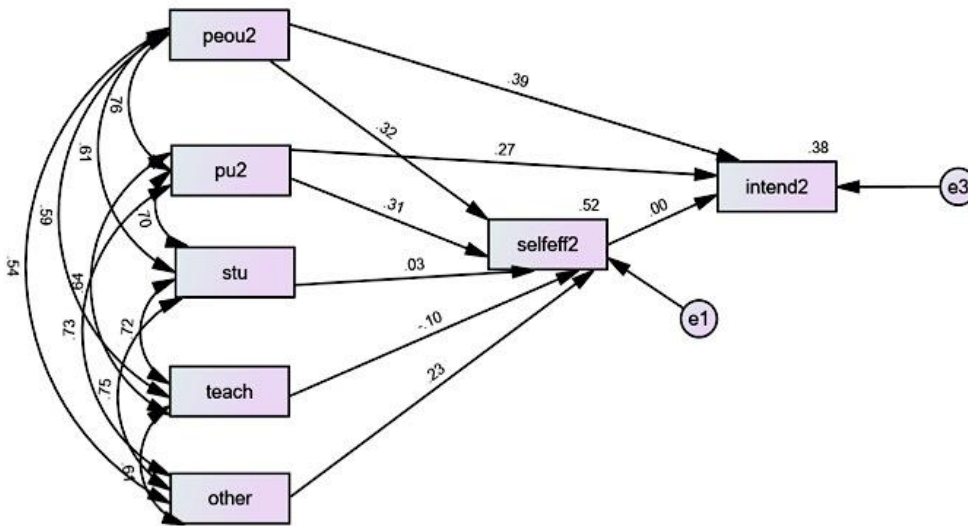


Fig. 3 - Modified TAM Model 1 (before adjustment)

The results of the model fit indices and presented in Table 4 are used to assess the modified TAM model of direct factors in explaining teacher *intention* to use of technology. From Figure 2, based on the squared multiple correlations (R^2), it can be seen that the modified TAM2 model explains 48% of variance in teachers' *intention* to use technology, and 52% in teachers' *self-efficacy*.

Table 4 shows that the fit statistics for the modified Model TAM 1 of direct factors shows most of the fit indices (Normed chi-square, AGFI, NFI, TLI, RMR, and RMSEA) do not conform to the fit criteria. However, after adjustment by making the variables, *teach* and *other*; directly link to *intend2*, the fit criteria improve (see Figure 2). The modified TAM Model 2 of direct factors provides a good fit with all the fit indices conforming to the recommended threshold values for the fit criteria. Therefore, it can be concluded that modified TAM Model 2 of direct factors provides a good fit.

Table 4 - Results of the SEM Model 1 and 2 of direct factors: fit and squared multiple correlations

Fit measure	Before Adjustment	After Adjustment	Recommended
	(modified TAM Model 1)	(modified TAM Model 2)	
χ^2	19.571	.754	p>.05
	p=.000	p=.385	
Degrees of freedom	3	1	
Normed χ^2	6.524	.754	Between 1.0 and 3.0
GFI	.953	.998	Over .90
AGFI	.624	.942	Over .90
NFI	.560	.998	Over .90
TLI	.758	1.0	Over .90
RMR	.183	.028	Lower than .10
RMSEA	.232	.000	Lower than .08
		Self-efficacy	Intention
R^2	Explained variance in Dependent Variables	52%	48%

In summary, the results show that the direct factors of teachers' beliefs of *perceived ease of use*, and teachers' beliefs of *teachers* and *other* people as influencers (as shown in Table 3) explain significantly TVET teachers' *intention* to use technology (as shown in Table 3). From Table 4, it was shown TAM model 2 (see Figure 2) is a good fit model to show that the direct factors of teacher' beliefs of *perceived ease of use*, *perceived usefulness*, and *other* people as influencers relate significantly to teachers' *self-efficacy*.

4. Conclusions and Recommendations

This study posits that TVET teachers' intentions to incorporate technology in their instructions can be influenced by building up their self-efficacy beliefs (their beliefs about their ability and capability to use technology), and to influence their beliefs of the usefulness and ease of use of technology. Underpinned by Technology Acceptance Model as the theoretical framework of the research, a professional development program on technology-enriched instruction was mounted. The study leveraged on the assumptions that the technology-enriched instruction professional development programme would engage TVET teachers to plan and design learning activities using a plethora of technology; and hence would improve their self-efficacy beliefs, and ultimately influences their intention to use technology in teaching and learning.

In conclusion, the current study recommends that there is a need to provide extended support for teachers to work together and design 21st century teaching and learning that intentionally integrate the use of technology. Extended support in this context refers to the development of teachers' expertise in technology use, and designing and planning lessons that integrate technology for 21st century skills development. Teachers need to get together and discuss 'what works and 'what needs to be improved in their lessons through teacher collaboration. In doing so, teachers can then design lessons that promote the development of 21st century skills through effective use of technology. Development of teachers' efficacy through influences such as other people (e.g. parents and community) is also needed for teachers to be motivated to make changes in teaching and learning. These changes can come in various forms, such as using technology to increase student's engagement, improve students' academic performance through various technological platforms. In addition, teachers also need professional guidance from experts in the use of technologies in teaching and learning. Such guidance may have a positive impact on teachers' self-efficacy beliefs towards the use of technology in teaching and learning. The results of this study provide a shred of strong empirical evidence for how professional development of the TVET teachers can be introduced and implemented to provide support requirements for technology integration in their 21st century teaching and learning; reinforcement and encouragement from colleagues and administrative leaders; and empowerment for teachers to develop their own 21st century teaching and learning.

Acknowledgement

We would like to extend our sincere gratitude to the TVET teachers who participated in the technology-enriched instruction professional development workshops, and those who also agreed to respond to the questionnaire.

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