MEDIATING EFFECT OF SELF-EFFICACY IN THE RELATIONSHIP BETWEEN TECHNOLOGY COMPETENCY AND LEARNERS' ACCEPTANCE AND USAGE OF E-LEARNING PORTAL

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Abstract

The purpose of this study is to investigate the mediating effect of self-efficacy in the relationship between technology competency and learners' acceptance and usage of e-learning portal among adult learners in one private university in Malaysia. The sample consists of 153 adult learners from various business programmes. Structural Equation Modeling (SEM), employing AMOS 22 was used to test the mediation effect and also the relationship between technology competency of learners with learners' acceptance and usage of the e-learning portal. A non-significant relationship was found between technology competency with learners' acceptance and usage of the e-learning portal. However, when the mediation hypothesis was tested, the result indicates that self-efficacy fully mediates the relationship between technology competency and learners' acceptance and usage of the e-learning portal. This study implies to policy makers that there is a need to train adult learners in the e-learning environment by reinforcing learners' self-efficacy to influence them in accepting and encourage them to use of the e-learning portal at their university.

Keywords: Online learning, self-efficacy, technology competency, learners' acceptance and usage of e-learning portal

1. INTRODUCTION

Globalization has an impact on developing countries like Malaysia to pay more attention to building its human capital to remain competitive with the rest of the world especially with its neighbouring countries. By the year 2020, Malaysia's envisage to be a developed country. By then, the expected working age population between 15 to 64 years will raise up to 26.2 million leading to a concern of the nation to provide better education and employment. Although, it is a known fact that formal education in universities and colleges in Malaysia continues to be important, however, the development of human capital through education through life-long learning remains imperative. For example, a prominent life-long education operator in Malaysia has more than 150,000 cumulative learners, 66,000 graduates, 11,000 tutors, 120 faculty members and about 500 support staff since its opening in year 2000.The recent e-learning through various platforms such as moodle has becoming important especially with the constant enhancement in technology. As a result, learners must not only keep abreast with the technology but also require the skills to use the technology in their learning environment.

Ambient Insight (2011)reported that Asia will have a massive growth in e learn business and thus it is expected that more high tech company would employ e- learning system in order to equip them with skill and knowledge to remain competitive. Malaysia experienced a rapid growth in e- learn business and was reported to have ranked next after China. However, past study had indicated that failures may result if the learners themselves are not ready to use the technology platform and physical technical support was not in place (Ouma, Awuor & Kyambo, 2013). Furthermore, Hsia, Chang and Tseng (2012) argued that although there was growth in the e-learn business, the acceptance is much lower than expected. This claim is also fully supported by other past studies by Ouma, et al. (2013) Zhang and Zhou (2003) and Padilla-Mele´ndez et al.(2008),Abbad, Morris and Abbad ,2009. (2009). Nevertheless, a recent study by researchers argued that the model will not reflex true picture on how learners may accept and use the e-learn platform without other interventions (Hsia, Chang & Tseng, 2012; Adwan, Adwan & Smedley, 2013; Al-Gahtani, 2014; Cigdem &Azturk, 2016).

Past study had indicated that intervention such as self efficacy was found to be significant in a meta-analysis study in classroom management (Aloe, Amo & Shanahan, 2013), in high–tech companies in Taiwan (Hsia et al., 2012), in higher education in Korea (Kim & Park, 2015) and among students in Technology Education Institutes Athens (Malliari , Korobili &Togia,

2011). In contrary, study by Eom (2012) found that there was no significant effect of self-efficacy in e-learning management systems (LMS) environment in a classroom based learning. Mixed findings were established in another study done by Schaffer, Chen and Oekes (2012) among multiple project based teams. Due to the inconsistency of past findings in different area of study and context hence, this study aims at making significant contribution by looking whether self-efficacy may have an effect to learners on accepting and use of e-learning platform and technology competency. Despite past studies (Abbad, et, al.,2009; Ouma et al.,2013; Teo & Noyes, 2014;Raaj&Schepers,2008) postulated that technology competency is much required for learners to be enrolled in any distance learning programme, little study is done in the context of adult learners in accepting and use of e-learn platform as a medium in their learning.

To better understand the effect of self-efficacy in the relationship between technology competency and learners acceptance and usage of the e-learn portal, this study adopt the technology acceptance model (TAM) based on the theory of reasoned action (TRA) coined by Davis (1989) and social learning theory by Bandura (1997). TAM theory as postulated by Davis (1989) assumed that in learners intention to use technology, there are two principals involved that are perceived ease of use (EU) and perceived usefulness (U)) while the dependent variable is behavioral intention (BI). In a meta-anaylsis study done by King and He (2005) there are variations in the application of the model.On the other hand, Bandura (1997) social learning theory on the other hand, is a bridge between behaviorist and cognitive learning theories. According to the theory, one must belief first that they can be successful through four basic foundations namely: enactive mastery experiences; vicarious experiences; verbal persuasion; and physiological or affective state.

Therefore, due to the limited study and mixed findings in different area of study and context hence, this study aims at making significant contribution analysing whether self-efficacy can have an effect on learners in accepting and use of e-learn platform and technology competency.

2. RELATED LITERATURE REVIEW

Past study among school children did not have problem in accepting technology in their class environment if the physical technical support is present (Ouma et, al., 2013).However, it will

be interesting to find out about the acceptance of technology by adult learners. It is a known fact that the millennium generation was born in the era of computer gadget and thus acceptance would not be a problem (Cigdem &Azturk, 2016). Success in e-learning can be achieved by understanding the level of learners' readiness of e-learning environments. However, for learning institutions to successfully integrate and realize the benefit of technology as a learning aid and teaching tool, some level of readiness is required for them to accept this type of learning mode.

On the other hand, Hsia et al. (2012) argued that though there is growth in the e learning businesses, the acceptance of e-learning is much lower than expected. This is also fully supported by other past studies by Ouma, et al. (2013);Zhang and Zhou (2003); Padilla-Mele´ndez et al.(2008) and Abbad et al. (2009). Nonetheless, past researchers argued that for e-learn to take place other factors must also to be present (Hsia, et al., 2012). For example study by Adwan et al., (2013) found that perceived usefulness have a significant impact on intention to adopt technology at the universities in Jordon. In another study, by Al-Gahtani, Al-Qahtani, and Al-Misehal (2013) have indicated that e-learning acceptance was influenced by factors such as perceived of use and social influence process variables (excluding demonstrability). Cigdem and Azturk(2016) had fully supported that perceived ease of use was significant with behavioural intention to use learning material systems (LMS) but self-efficacy was found not an important factor in Turkey. Past studies on self-efficacy were found to be significant in many studies by researchers (Aloe et al., 2013; Hsia et al., 2012; Kim & Park, 2015;Malliariet al., 2011). Recent study among medical students, however, indicated a positive correlation between self-efficacy and self-regulated learning in a problem solving learning environment (Demirören, Turan, & Öztuna, 2016). However, other studies such as by Eom (2012) in classroom based learning could not find the link between self-efficacy and learning management systems (LMCS) usage. Moreover, Chien (2012) found that the moderating link between computer self-efficacy among financial services employees in Taiwan with training effectiveness. Mixed findings were found in a study done by Schaffer, Chen, Zu and Oekes (2012) among multiple project based teams in the service learning program. The experiment method of data collection was done twice during pre-project launching and at the end of project. A considerable distinction was found among the teams in their performance outcome which many complexity and other team related problems.

Ahmed (2010)conjured that if the learning environment lack on the technical infrastructure and support, it will not promote e-learning. Higher learning can encourage the interaction and communication between learners and facilitators if the campus wide computer network is available for use and computer literacy is technically supported. However, for the learners, especially the adult learners to accept and use the platform that is available the eminent of the construct of self-efficacy must be in place. Self-efficacy acts as the motivational factor in influencing the acceptance and usage of the e-learning platform.

Technology competency refers as having the experience and the ability to use the computer effectively and also received technical support and training in using the e- learning system (Abbad, et al., 2009Ouma et al. 2013).On the other hand, Teo and Noyes (2014) refers it as facilitating conditions where the much needed support and infrastructure is required before anyone can embarked in the e- learn courses. Past studies had indicated that when there is lacking in that discipline area, learners will shun away from using the system and this may lead to high attrition rate (Selim, 2003; Raaij & Schepers, 2008; Gilakjani,2013).Ouma et al. 2013 fully supported the notion that learners in the e- learning environment at school must acquire certain kind of technical competency in order to be ready before enrolling into e- learn courses. The teachers have agreed that student must acquire the competency before implementing e- learning in the school system. Nevertheless, little study was done with respect to technology competency and acceptance and usage on e-learning portal among adult learners mediated by self-efficacy.

3. RESEARCH DESIGN

This study utilised a cross sectional research design of which the target population was the current learners of a private open university in Malaysia in the discipline of business studies. It was carried out in a period of 4 months in one the thirteen learning centers in Malaysian. Due to the homogeneity and also cost and time factor this study was sufficient to be represented (Jamaluddin, Hashim& Mahmood, 2014). A survey with nineteen-items was distributed to learners while they are around at the campus. The sample of this study was selected through simple random sampling. 250 questionnaires were distributed. One-hundred and fifty three (153) learners returned the questionnaires, indicating a response rate of 61.2%. The students were requested to respond as honest as possible to the items in the questionnaire and be assured that their responses will be used only for the research purpose and treated as strictly

confidential. Structural Equation Modeling (SEM), AMOS 22 was used to test the mediation effect and also the relationship between technology competency of learners with learners' acceptance and usage of the e-learning portal.

Most of the items used to operationalise the constructs were adapted from past studies which has been validated and tested in prior studies. Some of the items were reworded to suit the context of study. Technology competency and acceptance and usage on e-learning portal were adapted from Ahmed (2010) and self-efficacy construct was that of Cigdem and Azturk (2016). The items for all the scales were measured on a 5-Point Likert-type scale, anchored by 1, "strongly disagree" through to 5, "strongly agree. The questionnaire was administered in English and content validity was done by two professors from the university. To assess the reliability of the measurement items of all the variables, the researcher undertook Cronbach's Alpha coefficient analysis to test the reliability of the instruments. The instrument was tested for internal reliability and the following Table 3.1 demonstrates the scales generated.

Table3.1: Overall Internal Reliability

No	Variables	Reliability (Cronbach's Alpha)
1	Technology competency and acceptance and usage	0.895
2	acceptance and usage	0.788
3	Self Efficacy	0.913

The reliability tests indicate an excellent reliability for all its components with a coefficient alpha of above 0.7 exceeding the minimum acceptable level as suggested by Nunnally and Berstein (1994).

4. DATA ANALYSIS AND FINDING

Table 4.1 presents the demographic profile of the sampleof the respondents. The sample indicates that female respondents represented a slightly higher percentage of 74 percent when compared to the male respondents 26 percent. A majority of the respondents were middle age between 35 to 49 years of age (84 %) followed by those below 35 years old (14%). About 1 percent of the learners were older than 50. With reference to the programmes taken, majority of the students were taking business administration (63%), followed by human resource management (16%), management (12%) and the least were accounting (8%).

Table 4.1: Demographic Profile

Variables	Number (N)	Percent (%)
Age:		
Below 35 years	22	14.4
35 – 49 years	129	84.3
Above 50 years	2	1.3
Gender:		
Male	40	26.1
Female	113	73.9
Major:		
Human Resource Management	25	16.3
Accounting	13	8.5
Business Administration	97	63.4
Management	18	11.8

In order to test the mediation effects, the structural equation modelling (SEM), a very powerful multivariate technique was used. There are many advantages to using the SEM framework in the context of mediation analysis. When a model contains latent variables such as technology competency and self-efficacy, SEM allows for ease of interpretation and estimation. SEM simplifies testing of mediation hypotheses because it is designed, in part, to test these more complicated mediation models in a single analysis (MacKinnon, 2008).Figure 4.1 shows a path diagram for the causal relationships between the three variables in this research: technology competency, self-efficacy and learner's acceptance and usage.
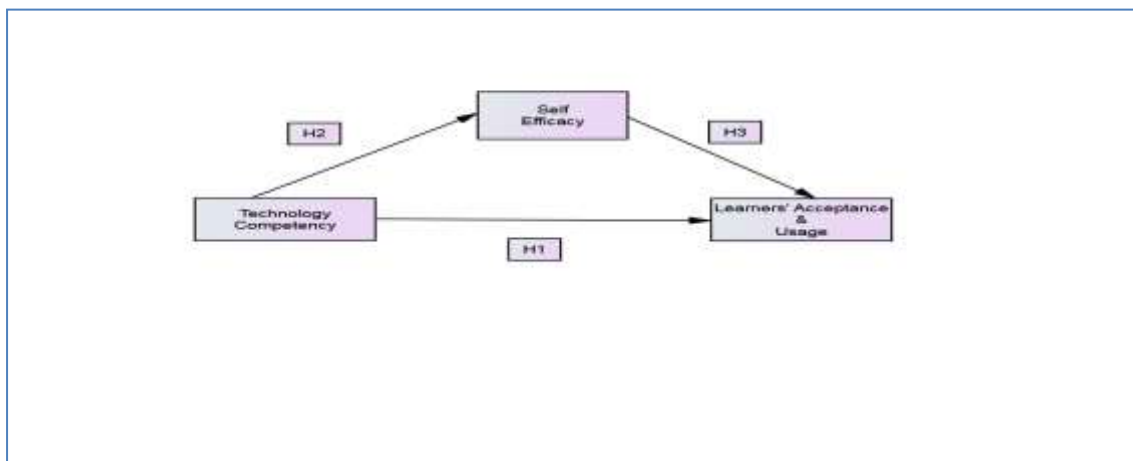

Figure 4.1: Path diagram showing the causal relationships between the three variables

The hypotheses to be tested in this study were as shown in Figure 4.1:

H1: Technology competency has direct and significant effect on learners' acceptance and usage (DIRECT EFFECT)

H2: Technology competency has direct and significant effect on self-efficacy (INDIRECT EFFECT)

H3: Self-efficacy has positive and significant effect on learners' acceptance and usage (INDIRECT EFFECT)

The results for each hypothesis were given as below:

a. **H1: Technology competency has direct and significant effect on learners' acceptance and usage**.
The AMOS estimates is shown in Table 4.1 below:

Table 4.1: Hypothesis Testing for Technology Competency on Learners' Acceptance & Usage

			Estimate	S.E	C.R.	p-value	Result
Learners' Acceptance & Usage	←	Technology Competency	.097	.098	.982	0.326	Not Significant

The probability of getting a critical ratio as large as 0.982 in absolute value is .326. In other words, the regression weight for technology competency in the prediction of learners' acceptance and usage is not significantly different from zero at the 0.05 level (two-tailed). Hence, Hypotheses 1 was not supported.

b. **H2: Technology competency has direct and significant effect on self-efficacy (INDIRECT EFFECT)**

The AMOS estimates is shown in Table 4.2 below:

Table 4.2: Hypothesis Testing for Technology Competency on Self Efficacy

			Estimate	S.E	C.R.	p-value	Result
Self-Efficacy	←	Technology Competency	.666	.121	5.520	0.001	Significant

The probability of getting a critical ratio as large as 5.52 in absolute value is less than 0.001. In other words, the regression weight for technology competency in the prediction of self-efficacy is significantly different from zero at the 0.001 level (two-tailed). Hence, Hypotheses 2 was supported.

c. **H3: Self-efficacy has positive and significant effect on learners' acceptance and usage (INDIRECT EFFECT)**

The AMOS estimates is showed in Table 4.3 below:

Table 4.3: Hypothesis Testing for Self Efficacy on Learners' Acceptance & Usage

			Estimate	S.E	C.R.	**p-value**	**Result**
Learners' Acceptance & Usage	←	Self-Efficacy	**.582**	.093	6.245	**0.001**	**Significant**

The probability of getting a critical ratio as large as 6.245 in absolute value is less than 0.001. In other words, the regression weight for self-efficacy in the prediction of learners' acceptance and usage is significantly different from zero at the 0.001 level (two-tailed). Hence, Hypotheses 3 was supported.

Based from the results of all the hypotheses, this research concludes that self-efficacy was found to be a mediating variable in the relationship between technology competency and learner's acceptance and usage. Besides that, to re-confirm the above conclusion, the researchers have used the procedure for testing mediator as outlined by Zainudin Awang (2015). Figure 4.2 illustrates the results of the procedures in reconfirming that self-efficacy does mediate the relationship technology competency and learner's acceptance and usage.
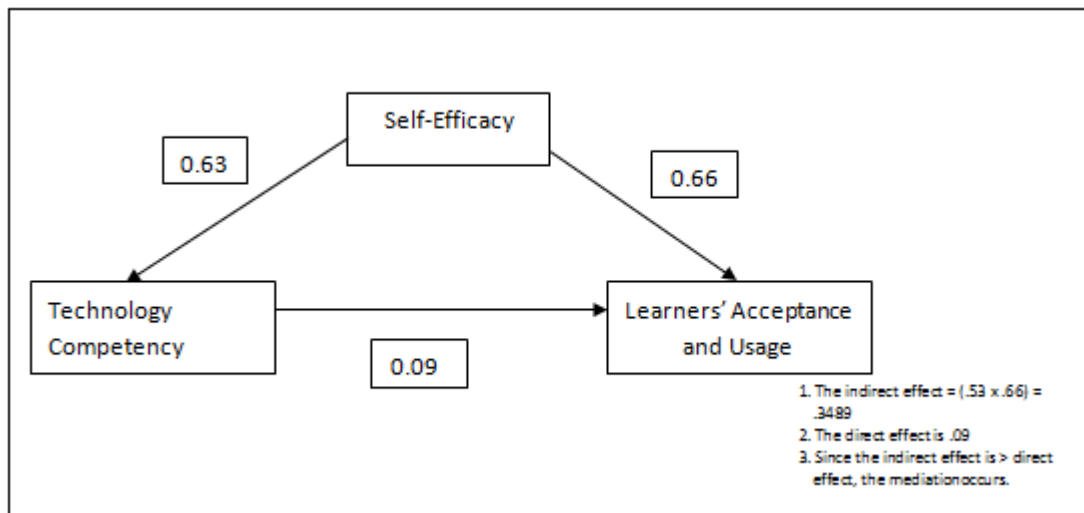

Figure 4.2 Mediating Effects of self Efficacy on the relationship technology competency and learner's acceptance and usage.

5. DISCUSSIONS AND IMPLICATIONS

This study has raised the issue that self-efficacy is significant to the success of using e-learning platform among adult learners in a private distance learning university. Learners' self-efficacy was found to mediate the relationship between technology competency andlearner's acceptance and usage on e-learn platform. This study fully supported that Aloe et al., 2013; Hsia et al., 2012; Kim & Park, 2015; Malliari et al., (2011) studies indicating the importance of self-efficacy. This study implies to policy makers that there is a need to reinforce learners' self-efficacy in influencing adult learners to accept and use of the any e-learning system at their university. It would be assumed that if this technology competency is being improved through support and training, then self-efficacy would be higher and thus the acceptance and usage of e-learning can be further enhanced. This research has its theoretical implications on the key area related to addition of new knowledge in e-learning theory by incorporating social learning theory and technology acceptance model.

6. RECOMMENDATION FOR FUTURE RESEARCH

This study also has its share of limitation in the sampling frame which only considers one distance learning private university in Malaysia and therefore the results cannot be generalized to the whole education industry. The e-learning mode of delivery and learning has become an important landscape in Malaysian education system where the providers may need to ascertain the presence of acceptance and usage of the e-learn platform among the students. Future study should consider inclusion of other variables, other modes of enquires such as employing longitudinal method of data collection design and a nationwide study covering samples from all the online learning providers in Malaysia. This study could also be replicated to other level of education such as the postgraduates' learners where students are more mature in terms of age.

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